WORKING PAPER:

MUSICAL AUTOMATION IN THE AUSTRALIAN GAMES INDUSTRY: CURRENT PERSPECTIVES

05

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Working Paper #05

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This project has been assisted by APRA AMCOS and the Australian Government through Creative Australia, its arts funding and advisory body. It also received funding support from UniSA Creative and the Creative People, Products and Places Research Centre (CP3).

Musical Automation in the Australian Games Industry: Current Perspectives

Available at https://metamiditoolkit.com/research-paper/

This research report was published as part of a broader research project, which you can access at: https://metamiditoolkit.com/

Acknowledgement of Country

We acknowledge the many Traditional Custodians of Country throughout Australia and honour their Elders past, present and emerging. We respect their deep, enduring connection to their lands and the richness of First Nations Peoples' artistic and cultural expressions and acknowledge that sovereignty was never ceded.

Acknowledgments

Thanks to Susannah, George, Alex, and all our research participants for their invaluable contributions to this project.

Thanks also to Kaya Blum, the Creative People, Products and Places Research Centre (CP3), UniSA Creative, Creative Australia, APRA AMCOS, High Score, and Games for Change for their support.

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Executive summary

As Generative AI (GenAI) and other forms of automation continue to shape and change aspects of the digital environment, labour processes, and the role of work as data, the creative and cultural industries face a significant period of transition. Focusing on the intersection between musical composition and sound design for games and the growing influence and impact of GenAI and digital automation, this report provides a case study and summary of extensive stakeholder research within the Australian games industry. Collected across the 2023-24 financial year, the data presented here is a snapshot of a sector in flux, with research participants expressing a wide variety of reactions, impressions and concerns about the impact of these new technologies on their industry. Crucially, the report discusses how industry workers are already integrating many of these new innovations into their professional practice, and how this practice is therefore being dramatically reshaped.

This report summarises stakeholder and industry research undertaken as part of a broader research project titled 'Musical Automation in the Australian Games Industry', the outputs, publications and documentation of which are available at https://metamiditoolkit.com/. This project was funded by Creative Australia and APRA AMCOS through the Digital Futures initiative, and allowed the research team to not only pursue the research outlined below, but to produce the following outcomes:

- **Life (Re)Sounding:** Demonstrating the capabilities of real-time audio-generation technologies, this narrative game has multiple levels and plays like an interactive 5-track album, putting players in the shoes of a young neurodivergent person. It is available for download here: https://metamiditoolkit.com/life-resounding/

- **MetaMIDI Toolkit:** This open-source audio toolkit allows game designers to re-appropriate the sound and audio design elements from Life (Re)Sounding for their own creative projects. It is available for download here: https://metamiditoolkit.com/metamidi-toolkit/

- **Video Documentary –** The project timeline of 2023-24 happened to be an explosive year for GenAI. Research assistant, composer and creator of the MetaMIDI Toolkit John Oestmann produced a documentary providing an overview of the project from his perspective: https://metamiditoolkit.com/documentary/

- **Stakeholder research:** 26 interviews with Australian games professionals on the impact of GenAI and

other technologies of automation on their work. These research participants included composers, sound designers, voice artists, developers, programmers, and consumers. Findings are discussed below and were also featured in APRA/AMCOS's recent 'AI and Music Report'.

The findings discussed below reflect the views and concerns of our 26 research participants, which included key workers and stakeholders within the Australian games audio sector. Interviews and questions focused on their perceptions, understandings and experiences of generative artificial intelligence programs and software (GenAI), as well as non-AI forms of automation, and the impact of these on their workflows and processes.

This report introduces the topic of musical automation in the Australian games industry, provides an overview of the project's research design and methodology, and discusses the findings of our research, which are presented in themed findings chapters. The report concludes with a discussion of the project's limitations and suggestions for further areas of research, as well as a series of recommendations for the Australian games industry, relevant stakeholders, policymakers, government, and non-government agencies.

Research design and methodology

The purpose of this research was to engage with audio and non-audio games industry professionals to understand how they are approaching and potentially integrating new technologies of automation into their work, inclusive of but not specific to GenAI. Our focus was on a cohort that we designated game-audio-specific creators (GAS), which included composers, sound designers, voice artists and other audio professionals working in the digital games sector. Our interviews also included other participant groups, namely non-audio-specific creators (NAS) (i.e., studios, designers, developers, artists, etc.), audio software developers (SDE), and consumers (CON). Although recruitment was initially aimed at sourcing a total of 36 participants (12 GAS; 8 NAS; 4 SDE; 8 CON), the final sample was 26 participants (17 GAS; 7 NAS; 1 SDE; 2 CON). The project's primary data collection method was qualitative, semi-structured interviews with professionals working at the intersection of audio and video game development to gain insights into how technology adoption is impacting audio creativity as well as broader attitudes and trends within the Australian video game industry. Interviews ranged from 30 minutes to two hours depending on each participant's availability and level of engagement. Key quotations from the interviews were compiled into a spreadsheet, using Notion, tagged with categories, associated questions, focus on AI/automation and emotional sentiment, and then thematically coded for analysis and discussion.

Definitions used in interviews

To help differentiate between artificial intelligence (GenAI) and non-GenAI automation, the below definitions were provided at the start of each interview to frame the questions and responses accordingly. While the participants were also asked if they had their own definitions or understandings of AI and/or automation, we provide our guiding terms below for the sake of clarity.
It is also worth noting that, even though the interview questions took a broad approach to the subject of AI and automation (e.g. including algorithmically curated recommendation systems such as those that drive YouTube and/or Spotify recommendations within questions and responses), most participants spoke primarily about generative AI programs such as ChatGPT, Midjourney, Suno, Udio, etc.

Key definitions include:

Artificial intelligence (GenAI): Software tools that become effective by being trained on very large data sets and take an experience-based approach rather than a rules-based approach to generating results and outputs (e.g. ChatGPT, Midjourney, Suno, Udio). This aligns with APRA AMCOS's definition of generative AI (Goldmedia 2024, p. 15).

Automation (non-GenAI): Software tools that automatically conduct a specific and chosen series of actions according to pre-set rules (e.g. user-created email rules, quantising music notes, sorting music notes to a scale, audio parameter modulation or automation, spell checker, other automatic workflow scripts). This aligns with an industry definition of reactive or analytical AI (Goldmedia 2024, p. 15).

Key findings

The findings reported here are drawn from interviews with 26 participants, including 16 games audio professionals (composers, sound designers, voice artists, etc.), 7 non-audio Australian games professionals (i.e., designers, developers, programmers), an audio software developer, and 2 consumer participants. The interview questions aimed to explore the role of automation and GenAI in the interviewees' professional workflows, as well as their perception of the changing technological landscape within the Australian games industry, specifically regarding composing and sound design for games. Key research findings have also been made available to the project's funding partners, APRA AMCOS and Creative Australia, and were included in APRA AMCOS's AI and music report (Goldmedia 2024).

These key findings include the following observations and analysis:

- **The economic need for greater productivity, increased turnarounds, and budget restraints in the Australian games sector is incentivising the accelerated uptake of GenAI and other forms of automation:** The games sector is susceptible to deadline-related 'crunch', which necessitates faster workflows and increased automation. However, 'quick work' is often valued less, and the participants made comparisons between the use of automation/AI and 'fast fashion'.

- **Automation is widely accepted, while GenAI is not:** Non-AI automated processes, tools and workflows are not perceived as encroaching on creativity and the majority of the participants find these technologies to be empowering and indispensable, whereas GenAI is seen as a 'black box' that many workers and professionals in the sector are hesitant to use. This raises questions as to where the line is between GenAI and non-AI automation.

- **Generative AI is still in its early stages of development and has problems:** Participants expressed that the problem of AI inaccuracies, described as 'hallucinations', is a cause for concern, and that GenAI also often results in low-quality outputs.

- **Mixed emotions:** Workers in the Australian games industry have mixed feelings about the impact of GenAI, ranging from hopeful to scared. Audio workers (composers, sound designers, etc.) were generally more pessimistic than non-audio games professionals. Many see GenAI as extractive and potentially exploitative, while others note that it will increase productivity and efficiency. However, most participants expressed some concern about whether a generative AI was ethically trained.

- **Fair compensation:** It is widely accepted throughout the games/audio sector that the authors of any material or work that is being used to train AI datasets should be fairly compensated and/or credited.

- **Hard to keep up with new tech:** Many workers feel overwhelmed by the pace of technological change, while others noted that it is difficult to adapt and reskill. Research participants also noted that many developers and studios have their own completely unique workflows and production pipelines and are therefore often resistant to change or the integration of new technologies into their workflows. It was also noted that some forms of GenAI may be unapproachable

for workers with low technological or critical literacies, possibly excluding them from sectors that may come to rely more heavily on these technologies.

- **Confusion:** The use of the term 'artificial intelligence/AI' to market an increasing number of products in the audio space has led to confusion as to what GenAI actually is and how it is affecting workflows. Most of the interviewees expressed this.

- **Taboos:** Some audio professionals who are interested in working with GenAI do not feel like they can speak openly about the subject in their communities, as it is seen as somewhat taboo. Several participants expressed that discussing it openly may risk professional ostracism.

- **People already use GenAI/automation in their daily lives more than they realise:** These tools are already becoming omnipresent within workflows and industrial settings, regardless of whether uptake has been deliberate or not.

- **GenAI and other automotive systems have a large range of potential applications:** Many workers in the games audio sector see automation as helpful in terms of administration, composition, ideation, workshopping, programming, and as an educational tool. These systems also have helpful applications for neurodivergent professionals and workers who may struggle with time management or other attention-related issues. However, some note that GenAI and other automotive systems may replace key roles and professions, and it is unclear whether the pros outweigh the many cons.

- **Unclear ethics relating to AI and loss of work:** Voice-over artists are already having much of their work 'automated away', with concerning implications for the profession. Some participants also believe that GenAI does not create new products; it simply assimilates and homogenises pre-existing work, often amounting to theft or copyright infringement. Others associate GenAI with 'bad actors'. Most participants also believe AI will replace jobs.

- **Misrepresentation of marginal groups:** While this requires more specific and targeted research, GenAI has serious implications for the appropriate representation of marginalised identities, especially the work and identities of First Nations workers, professionals and artists. The understandings, thoughts and feelings of professionals in rural communities regarding GenAI should also be an important point of consideration in any future research.

- **GenAI, like automation, has the potential to expand resources and productivity:** Over half of the participants noted that AI/automation allows more time for creativity, as workers can automate the more tedious elements of their workflow. Many professionals who would prefer not to use AI explained that they would consider using it in the face of time or budget constraints, while others stated that GenAI allows teams and individuals to deliver more than they would without it.

- **Bespoke, human creation is seen as more authentic and better quality:** The participants noted that AI produces 'quick and cheap' results, whereas human-centred 'hand-made' work is seen as better quality and more authentic. Most interviewees expressed a preference for this kind of 'authentic' work. They also raised doubts about whether audiences would connect with work primarily produced by GenAI as opposed to human-created work, centring the role of the artist as the point of connection and empathy with audiences.

- **Loss of community/collaboration:** Several participants expressed concerns that the prevalence of GenAI may reduce the amount of collaboration across the sector, resulting in an erosion of a sense of professional community, as well as potential loss of institutional knowledge and specific creative skills.

Recommendations for the Australian games industry and policymakers

Recommendations for the Australian games industry, relevant stakeholders, policymakers, government, and non-government agencies include:

- **Transparency and licensing:** Workers and industry professionals should be mindful of whether their creative work is being licensed or mined for data that may be used to train AI models. Firms and businesses should have transparent and publicly available agreements regarding the use of content, including remuneration arrangements if content is used for AI training. Source/s of data used to train AI should be publicly disclosed, and this should be enforced with legal obligations. The development of a transparency mechanism to promote and ensure transparency for copyright owners across the AI lifecycle should be a priority.

- **Funding and resources:** The Australian games industry is currently experiencing a period of significant contraction, which is constraining resources and

increasing the prevalence of "crunch". This may increase reliance on GenAI and automation at the expense of appropriately reskilling the workforce. The federal and state governments should consider new and expanded funding arrangements for the digital games sector to mitigate the effects of this contraction. This should also involve the development of robust strategies to preserve essential skills development opportunities for creative industries trainees and apprentices more broadly.

- **Education and training:** GenAI and other forms of automation are rapidly changing the way we work, both in the games, creative and cultural industries, and beyond. Current vocational and tertiary training pathways need to be expanded to include and account for the impact of these new technologies, as well as to improve digital and critical literacies generally.

- **"AI Hype":** The ACCC and/or other relevant regulatory bodies should review the potential mislabelling of new applications, plugins, and products as AI, in a similar manner to that of the US Federal Trade Commission's recently announced 'Operation AI Comply'. This would provide both clarity for professionals and consumers, and act as a deterrent for companies leveraging "AI Hype" to market their products.

- **Consent and compensation:** The use of content to train generative AI models should be subject to consent and compensation. Creators data should only be used for training generative AI under an opt in basis. An AI licensing framework that aligns with the consent, credit and compensation tenets of the existing copyright regime should be implemented.

- **Protections for creatives:** The right of creators to their image, voice, movement and likeness requires legislative protection.

- **Control:** Any creator, rights holder or person who consents to their voice, likeness or creative output being cloned using AI technology should be able to, if they so wish, have control over how, by whom, where, and what content their work is used for. The terms of such contract should not be changed, nor should such a contract be upsold for profit or on-sold to another entity.

- **Copyrights for humans, not AI:** Copyright should not be extended to works predominantly or exclusively generated by AI.

- **Consultation:** Firms and businesses within the games industry should consult with their workforce regarding the adoption of new technologies of automation or those otherwise powered by GenAI.

- **Marginalised groups:** Further research is required to discern the impact of GenAI and other new technologies on the representation of marginalised groups within creative work.

- **First Nations cultural protections:** A regulatory framework to protect First Nations cultural and intellectual property should be developed and legislatively protected. Mitigation of the risk of cultural harms, with a particular focus on local Aboriginal and Torres Strait Islander (ATSI) creators, should be a priority.

- **Representation:** Workers' representatives should be included on any consultative committees convened specific to the use of AI. This includes workplace, industry, government and policy consultation.

- **Risks and harms:** The use of AI should be limited or curtailed based on the risk categories established within the EU AI Act (e.g. in the generation of explicit and harmful content).

- **Inquiry:** A parliamentary inquiry into the impact of AI on copyright and intellectual property should be established, with a view to informing legislation like the EU's AI Act.

Introduction: musical automation in the Australian games industry

Since the popular advent of prompt-driven, text-to-output generative artificial intelligence services (GenAI) in late 2022 (Griffith & Metz 2023), the automation of art has continued to dominate headlines (Lam 2024; Thorpe 2023; Wong 2024). While much of the initial public discourse was focused on the automation and generation of image, design and text-based communication, technologies which utilise large language models and other large-scale reference databases to produce outputs (i.e., ChatGPT, Midjourney, DALL-E, etc.), the use of GenAI to create complex musical works only became broadly available towards the end of 2023, following the release of Suno, Udio and other GenAI-driven musical automation services (Potter 2024). However, prior to the release of these new generative services, the composition and production of music has been undergoing a process of gradual automation for many decades. Indeed, '[o]ne of the earliest AI technologies, available for more than two decades, is Autotune' (Anantrasirichai & Bull 2022, p. 601). Therefore, the emergence of GenAI-driven music and audio applications in the first half of the 2020s is a seemingly large leap in the ongoing automation of creative labour, specifically the creation of music.

As in other realms of creative production, the use of GenAI and other automotive systems to compose, produce, mix and master musical works poses both an opportunity and a threat. This research project explores the potential of musical automation and other generative technologies in composing, sound design and audio production specifically for digital games, drawing on stakeholder research to explore how practitioners and industry professionals are confronting and utilising these new technologies. Based on qualitative interviews with game audio creators (composers, sound designers, voice artists, etc.), games professionals (developers, programmers, artists, designers, marketing and studio managers), a game audio software programmer, and consumers, this report details what current practitioners consider the key strengths, weaknesses, opportunities and threats associated with these emergent technologies, how they are integrating these new technologies into their workflows, and how such technologies have impacted their horizons of expectation, for better and worse.

Automation could make significant contributions to empowering composers, musicians and other creatives who create music and sound for digital games. However, GenAI and other technologies of automation could also replace many key functions and roles within

industries that engage such creative professionals. The Australian games industry therefore serves as an interesting and relevant case study through which to explore such questions.

The Australian games industry

The Australian games industry has seen significant growth in recent years (Muhammad 2023),[1] with a range of innovative and successful titles being developed by local studios (Fritsch 2024). According to the Interactive Games and Entertainment Association (IGEA), 81% of all Australians play video games, the Australian games industry generates $345.5M annually and is growing at approximately 20% per annum, and Australians spent $4.4 billion on games in 2023 (Brand et al. 2023). Such major growth and rapid expansion has had obvious implications for the role of music in games, as well as professions in the music and audio industries generally, as large-scale growth and employment opportunities in the games sector often have implications for adjacent professions and industries (Santasärkkä 2017).

This growth has seen increased recognition and development of music and audio for games, with scores and musical production on local titles receiving multiple awards (Untitled Goose Game, Cult of the Lamb, Heavenly Bodies) and Australian composers featuring on many major international titles (Mick Gordon, Christopher Larkin, Kevin Penkin). As part of this growth, there has also been a notable increase in the use of musical automation in game development, specifically in the realm of player interactivity and its impact on the role of adaptive audio, as well as the automation of pre- and post-production processes, such as mastering (Birtchnell 2018).

Music in games and other licensing opportunities provide unique and potentially lucrative prospects for Australian composers. Effective musical automation will substantially streamline the composition and production of music made for games. However, such music still requires a human touch, and the role of games audio professionals in curating musical automation may create strong revenue streams for these artists. Yet, at present, little is known about how games audio professionals relate to these new technologies and the degree to which they understand its potential value to the broader games and music industries.

Such automation utilises GenAI, as well as other automated software tools that conduct a specific and chosen series of actions based on user inputs, which we define as non-GenAI automation. The integration of these technologies raises new questions, problems and opportunities for creatives working in music and audio for games, expanding the creative potential of music in games while also replacing key components and roles within the production process. One new software design that warrants

specific mention is Epic Games' new MetaSounds program, which serves as a key case study for this project.

MetaSounds

In 2021, Epic Games' Unreal Engine implemented MetaSounds, a node-based programming system which allows for real-time sound synthesis[2] and digital signal processing.[3] While reactive and interactive music and audio has been a component of video game development for decades (Sweet 2014), this system allows the relevant instruments and audio composition to be synthesised from scratch, on the fly, using nothing pre-recorded, based on what is happening in-game (i.e., player interactivity). The advent of this new technology provoked the authors of this report to consider how games composers and audio creatives, as well as other games professionals, are thinking about and approaching these new technologies. The emergence of MetaSounds also warranted a consideration of how best to utilise these accessible technologies of player-reactive and live-synthesised music, how to share our findings, and what form such findings and demonstrations could take.

During the development of this project, Unreal Engine 5.4 was released, including their Harmonix plugins for MetaSounds, which then allowed us to easily implement MIDI functionality into this MetaSounds toolkit. With the assistance of Creative Australia (formerly the Australia Council for the Arts) and the Australasian Performing Rights Association–Australasian Mechanical Copyright Owners Society's (APRA AMCOS) Digital Futures initiative, our project team was able to create a program of outputs that demonstrate and explore many facets of the changing landscape of music in games, including a new game, an open-source game audio toolkit, a short documentary, a website and this industry report.

Project overview

Life (Re)Sounding

To demonstrate current advances in generative musical automation for games, the project team developed a small, five-level game – a kind of interactive five-track album – titled Life (Re)Sounding. Each 'track' takes place inside a virtual real-time environment created in Unreal Engine. The tracks play out while the 'player' is in each room; however, the musical composition, instrument design and audio effects all change dynamically based on how the player moves around the room and interacts with objects within it. Key narrative events occur at set times during the music track, and manifest in the room accordingly. This creates

a multi-sensory, changing, interactive album experience, grounded in video game and interactive narrative theory.

Beyond a demonstration of new technology, Life (Re)Sounding utilises adaptive audio and musical-sensory cues to enhance understanding of the experience of neurodivergence for the player, raising awareness of neurodiversity by encouraging players to engage with slices of life of a neurodivergent person thrust into a neurotypical world. While acknowledging that every neurodivergent person has different experiences, through game design elements including mechanics, environments and audio, Life (Re)Sounding aims to put players into the shoes of a neurodivergent person, encouraging them to experience some of the ways that neurodivergent individuals are forced to navigate challenges that may not be apparent to the surrounding world and the complexities that come with this. From a first-person perspective, players explore several environments, including a childhood bedroom and a classroom, where they are required to carry out tasks that are expected in these spaces but are not designed for neurodivergent brains.

Unlike the DSM-5 diagnostic criteria for autism and ADHD, which view neurodiversity primarily through the lens of how it affects others, Life (Re)Sounding explores the lived experiences of neurodivergent individuals themselves – through their own eyes. For example, in a task where you are required to sequence blocks in a specific order (a common component of many school readiness tests designed for neurotypical brains) the blocks are coloured similar to the walls and furniture in the room, blending into this space and making them hard to find for the player, whereas the toys in the room are bright and inviting. This provides a visual representation of the interest-based nervous system common in many neurodivergent people.

Informed by the personal experiences of the design team, those close to them and academic research in this space, Life (Re) Sounding aims to raise awareness of how hard it can be to exist as a neurodivergent person, while also celebrating the transformative power of self-discovery and community connection. As part of this project, our team created the 'MetaMIDI Toolkit', an open-source collection of MetaSounds Blueprints for Unreal Engine 5.4 designed for adaptive music manipulation, via an intuitive and abstracted user interface for game designers without needing technical musical proficiency. The core toolkit music and synthesis MetaSounds Blueprints are also open for composers to customise as far as needed for the project, or to change the compositions entirely. Using this toolkit, the game can dynamically adjust its auditory environment to reflect the game character's in-game actions and emotions. In the blocks example discussed earlier, the MetaMIDI Toolkit allowed us to create audio that increases in volume and tempo when the player approaches toys and imagery reflecting the character's special interests but decreases in these

areas when the player approaches the blocks required to be moved for the task, also demonstrating the interest-based nervous system. Through the integration of the MetaMIDI Toolkit and other game design elements, Life (Re)sounding aims to communicate the complexities of neurodivergent life, fostering awareness of the challenges faced by neurodivergent people existing in a neurotypical world, promoting empathy among players. The game is freely available to play online at metamiditoolkit.com/life-resounding. Further, it demonstrates the capabilities of the MetaMIDI Toolkit, another key output of this project.

The 'MetaMIDI Toolkit'

The MetaMIDI Toolkit was instrumental in assisting our development team to communicate key narrative and emotional elements through gameplay for Life (Re)Sounding. It serves as a 'musical automation toolkit' for game designers and mixed-media composers, which is now available (https://metamiditoolkit.com/metamidi-toolkit/) as open-source code in line with the open-source movement[4] that has played a significant role in advancing digital automation (Carillo & Okoli 2008). Any other musician, composer or games professional interested in this technology can now use or adapt the toolkit to create playthrough-specific results quicker than if they were to compose an entire soundtrack and implement an adaptive audio system from scratch. This project has therefore produced not only a demonstration of what can be achieved with live adaptive compositional and sound design systems in a video game context via Life (Re)Sounding, but also a design framework and project code freely available for other composers and musicians to utilise for their own projects. We believe the MetaMIDI Toolkit is an important example of one non-'black-box' approach to intuitive audio generation in the era of 'black-box' GenAIs, as it empowers composers and designers to harness adaptive music technology to create meaningful and empathetic gaming experiences, allowing for deeper immersion and player engagement.

Documentary

As well as a demonstration of generative musical automation and the capability of Unreal Engine to produce such work, the project has also captured the limitations, boundaries and guidelines for human–computer/human–algorithm co-creation, documented via a 32-minute documentary, available on our website, https://metamiditoolkit.com/documentary/. The documentary provides an overview of the creative and developmental process, providing further background and context on the creation of both Life (Re)Sounding and the MetaMIDI Toolkit, as well as crucial global developments in music GenAI, which were occurring alongside our project timeline. It therefore couches the findings of this report in an understanding of how our own creative team confronted the challenges and opportunities of these new technologies, providing

an overview of how this technology works in practice alongside Life (Re)Sounding and the MetaMIDI Toolkit.

Industry research

The final component of the project, captured in this report, was interview-based qualitative research with industry professionals working in the field. This report summarises our stakeholder research with game designers, game audio specialists and industry partners, exploring the potential of AI and non-AI automation for composers and musicians in games by reporting the key findings, recommendations and data gained throughout this research. The report therefore hinges on interview-based qualitative research on product development opportunities for Australian game studios interested in musical automation. Research interviews with stakeholders focused on the implementation and effectiveness of generative music in game development, as well as the benefits and challenges of these approaches. However, importantly, the preamble to the interview questions delineated a distinction between AI and non-AI automation technologies, the working definitions of which are discussed below. While participants were welcome to explain their own definitions if different, most agreed with the definitions provided, and this helped to frame participant responses.

Key terms

Emerging alongside the first computer music programming languages created by Max Mathews in the 1950s (Roads & Mathews 1980), musical automation has previously encompassed the automatic creation and manipulation of all spaces of audio and audio workflows, whether it be sound synthesis, deterministic or stochastic musical composition, or automated digital signal processing. However, until recently, the human designer had to design the rules for this automation.

Generative AI is an exciting development in audio and sound production and an emerging field of research (Engels, Tong & Chan 2015; Plut & Pasquier 2020) with serious implications for the generation of sound and audio content in video games and other interactive media. Both generative AI (GenAI) and non-GenAI automation can significantly speed up composition and music creation processes. However, where automation requires humans to set the 'rules', GenAI's rules are largely defined through its training process, and activated by an input prompt from a user.

To clarify, in this context generative AI (GenAI) involves using machine learning algorithms to create new music. The system learns from both existing music and what is happening in the game to generate new pieces based on patterns (i.e., GenAI is experience-based and generative). Many GenAI software tools are trained on very large datasets of pre-existing material to convincingly generate new work. Examples of GenAI services include ChatGPT, Midjourney and Suno.ai, as well as a plethora of other prompt-to-output generative systems creating everything from short prose to whole musical pieces.

In contrast, non-GenAI automation (which we define here as automation) generally consists of software tools that automatically conduct a specific and chosen series of actions based on programmer presets and inputs (i.e., it is rules-based and determinative). Examples include user-created email rules, quantising musical notes, sorting musical notes to a scale, audio parameter modulation or automation, spell checker, and other automatic workflow scripts. In terms of the current state of musical automation vs GenAI, the composer generally has more discrete control over the output of automation compared to GenAI. However, some composers are now using text-based GenAIs to author programming code (i.e., the 'rules' that govern compositional creation), which then forms the basis for automated audio processes, blurring the lines between GenAI and automation as we have defined these terms above.

This project maintains a distinction between GenAI and automation for the sake of clarity, noting that automation is an inherent factor in many digital processes and workflows, whereas GenAI is a more recent and distinct phenomenon. It is also worth noting that, while our interview questions initially asked about any AI tools used in music, most answers given by interviewees concerned GenAI specifically. For this reason, the game audio trends discussed in this report largely focus on GenAI.

Summary

This project and subsequent report provide insights into the role and impact of musical automation in the Australian games industry, specifically focusing on the use of GenAI and non-GenAI automation. The results, findings and recommendations of this research are aimed at assisting game audio and other games professionals to better understand the benefits and challenges of using these approaches in game development, and to identify best practices for implementing them effectively. Alongside these findings and recommendations, we hope to shed light on this rapidly transforming and incredibly dynamic period in the history of audio and sound technologies, with the automation of music for games serving as a compelling case study.

1 **However, the Australian games industry is currently experiencing a considerable contraction following substantial investment in the global games sector throughout the COVID-19 pandemic (Ryan 2023), creating a bubble which has since burst.**

2 **Sound synthesis uses analogue or digital algorithms to generate audio without needing any prior recordings or 'samples'.**

3 **Digital signal processing (DSP) uses algorithms to manipulate digital audio signals in various ways. For example, a reverb plugin will utilise DSP to transform audio to sound like it is in an echoey location.**

4 **Part of what powers automation across tech industries is the tradition of sharing digital tools and programming code (via open source or similar globally recognised licences). Applying this tradition to this project means that the created musical works, programming code and design framework are free and publicly available to be accessed and expanded upon, helping to build a critical base of shared knowledge.**

Research design and methodology

The purpose of this research was to engage with audio and non-audio games industry professionals to understand how they are approaching and potentially integrating new technologies of automation into their work, inclusive of but not specific to GenAI. Our focus was on a cohort that we designated game-audio-specific creators (GAS), which included composers, sound designers, voice artists and other audio professionals working in the digital games sector. Our interviews also included other participant groups, namely non-audio-specific creators (NAS) (i.e., studios, designers, developers, artists, etc.), audio software developers (SDE), and consumers (CON). General interview questions asked of all participants were concerned with capturing understandings, perceptions and emotions specific to the growing popularity and increased disruption of automation and GenAI in the creative industries and games sector. Each participant group was also asked a series of profession, role and/or behaviour specific questions (see Appendix 1 for the full list of questions).
Ethics approval was granted by the University of South Australia's Human Research Ethics Committee.

Recruitment

Recruitment was primarily via professional networks, as three members of the project team are well acquainted with and integrated within the South Australian games industry as game designers, composers, and programmers. Initial participants were identified amongst the project team's professional networks and approached via email, with follow-up emails and other communications sent through the social media instant messaging platform Discord, which is popular within the games sector for networking and peer-to-peer communications, as well as via other social media platforms such as Facebook. The project team also reached out to funding partners Creative Australia and APRA AMCOS for assistance with recruitment and advertising for research participants. Following this initial round of recruitment, the researchers employed a snowball sampling method, seeking recommendations from interview participants for further relevant potential participants.

Potential participants were approached using the same email template, which identified the researcher, the project's focus, its funding partners and the preferred participant categories, as well as expectations regarding the interview itself. Once they had expressed an interest, participants were provided with a participant information sheet (Appendix 2), consent form (Appendix 3), and a

copy of the interview questions (Appendix 1), which began with a question asking them to self-identify their participant category: either GAS, NAS, SDE or CON. Although recruitment was initially aimed at sourcing a total of 36 participants (12 GAS; 8 NAS; 4 SDE; 8 CON), the final sample was 26 participants (17 GAS; 7 NAS; 1 SDE; 2 CON).

Methodology and data collection

The project's primary data collection method was qualitative, semi-structured interviews with professionals working at the intersection of audio and video game development to gain insights into how technology adoption is impacting audio creativity as well as broader attitudes and trends within the Australian digital games industry. The methodology was therefore ethnographic, and shares similarities with other sociological studies of creative practice. The aim of our research was to uncover how workflows and attitudes are being impacted or changing because of the emergence of GenAI and other, less encompassing technologies of automation.

Most interviews were conducted via Riverside, an online video chat platform that can record high-quality audio and video while simultaneously hosting a teleconference call between multiple parties: in this instance, the researcher and interview participant. The first part of each interview followed the same set of pre-set questions (Appendix 1), with the participants asked to self-identify with a specific cohort of participants from the outset. General questions asked of all participants focused on attitudes and perceptions of GenAI and/or automation, whereas questions specific to each cohort covered questions related to professional experience, style and/or genre, workflow, working environments, and the impact of GenAI and/or automation on these elements. Interviews ranged from 30 minutes to two hours depending on each participant's availability and level of engagement.

Data analysis

Interviews were transcribed using Riverside's AI transcription service. All generated transcripts were read through by the original interviewer (John Oestmann) to catch any major mistakes, of which there were very few. Key quotations from the interviews were compiled into a spreadsheet, using Notion, tagged with categories, associated questions, focus on AI/automation and emotional sentiment, and then thematically coded.

In analysing the interview transcripts, we followed guidelines for template analysis outlined by Brooks et al. (2015), which is itself a form of thematic analysis. In their work on thematic analysis for qualitative research, Braun and Clarke (2006) provide guidelines

for a particular style of thematic analysis and acknowledge that there are multiple ways of conducting thematic analysis and it can exist as its own methodology. We began by familiarising ourselves with the content within the interview transcripts, taking a deductive approach and isolating a subset of six interviews (2 NAS, 2 GAS, 1 SDE, 1 CON) to conduct preliminary coding of the data. From this we began to organise our emerging themes into clusters of codes which would inform the initial template. This initial template was applied to a further six interviews, with the template being refined where codes were identified as redundant, or a discovered theme was not covered by an existing code. We continued to refine the template iteratively throughout this process whenever it was deemed unable to cover data relevant to the research aims. Once we were confident the template was able to code all relevant data, it was then applied to the remaining data, which allowed us to rapidly code content in line with the existing themes and subthemes.

Findings: GenAI, automation, productivity and work

Applications of AI and automation in industry, especially the games audio sector

GenAI and automation technologies have already woven themselves into the fabric of daily life and professional workflows, often without users fully realising to which extent (Pink & Sumartojo 2018). From routine administrative tasks to complex industrial processes, these tools are becoming increasingly omnipresent due to many established software and media companies integrating GenAI as part of their standard products (e.g. the Adobe suite, Google search, Microsoft Office). Our participants also spoke to how automation has become so ingrained that many users and workers may not even realise it:

there's a lot of, even just automatic procedures in terms of, like, assigning, I don't know if this counts as automation, but for example, I use Musio for the orchestral stuff. I open up a horn plugin or whatever, and all my MIDI CC assignment is already done. (GAS-003)

I think so many [industry] plugins have little sort of influences of automation in some way [or other] nowadays. FabFilter's Pro-Q3 plugin even has some sort of automotive influence from frequency input. And then I suppose it looks out for frequencies nowadays to suppress muddy bits, sort of like Neutron by [iZotope] ... that sort of stuff saves me a lot of time especially when you're working with, like, 80 to 100 track layers. It's so much faster just to have that set up. (GAS-002)

Such software and online platforms have all been adding AI assistant features to their document editors over the last few years. This affects much of the conceptual and administrative side of audio and sound design. Our participants addressed the potential creative applications of these technologies, stating:

I'd see people getting worked up about it. And I don't know what the big deal is. It's just like, I mean, cause back in the, what was it, the thirties, forties, whenever synthesisers started being made, people were like, 'Oh,

it's going to take musicians. It's going to take jobs away.' And maybe it did, but like, it also opened up this whole other world of possibilities for people to be creative. (GAS-007)

In terms of automation, I see it as, like, utilities. Like, for example, being a developer, I write scripts. So, if I'm doing something and it's gonna take me a long time, I'll automate it by writing a script. Some examples I can think of that I use, like, every day are, like, autocomplete in my code editor. (NAS-002)

Further, image and video licensing services, such as Shutterstock, have introduced AI generators as part of their offerings. Also, and with specific relevance to our project, the iZotope audio post-production suite has been including 'AI assistants' for about the last five years. This was the most common example of AI assistants cited across our fieldwork interviews. However, the iZotope audio post-production suite is more likely to be classed as AI-powered analysis tools rather than GenAI. In terms of digital automation more broadly, many professionals rely on automated email filters, calendar scheduling assistants, and predictive text features in their day-to-day activities. These tools enhance productivity by streamlining communication and organisation, yet their seamless integration into everyday tasks means their presence is frequently overlooked (Acemoglu & Restrepo 2018).

Participants also highlighted GenAI and automation's ability to increase productivity and streamline workflows. For example, game developers and designers can use GenAI to automate routine tasks such as coding, testing and debugging, allowing them to focus on more creative and complex aspects of game development. Additionally, GenAI and other forms of automation can assist in generating content, such as character designs, storylines and environments, thus speeding up the development process and enabling smaller teams to compete with larger studios.

GenAI can also automate scheduling, email writing, and other routine processes, freeing up valuable time for creative endeavours. In composition and ideation, GenAI can generate musical ideas and narrative elements, providing inspiration for artists and developers. In these ways, many of our participants in these fields view GenAI as an invaluable assistant, capable of significantly enhancing various aspects of their workflows. Additionally, as a workshopping tool, GenAI can rapidly prototype ideas, allowing teams to iterate and refine concepts more efficiently.

GenAI's utility extends to programming as well, where it can assist with code generation, debugging and optimisation, thereby streamlining the development process (Şimşek, Gülşeni & Olcay

2024). This adaptability makes GenAI a versatile tool that can cater to a broad spectrum of needs within the creative industries. For instance, in game development, GenAI can prototype both audio and visual content, suggest improvements, and even predict user preferences, enhancing the overall gaming experience. Importantly, GenAI and other forms of non-GenAI automation also hold promise for supporting neurodivergent professionals and workers who may struggle with time management or other attention-related challenges (Keil & Ketzer 2024; Leung 2024). Some interviewees noted that using ChatGPT and other systems to generate email and professional copy helps to reduce stress and time spent on administration. By speeding up repetitive tasks and providing structured frameworks for project management, GenAI can help these individuals – including those with neurodiversity – maintain focus and productivity. Tools powered by GenAI can also offer reminders, break tasks into manageable segments, and adapt to the user's working style, thus fostering an inclusive work environment that accommodates diverse cognitive needs (Huang & Rust, 2018; Keil & Ketzer 2024). However, the integration of GenAI into the games industry is not without its concerns.

In other industrial and professional settings beyond the creative industries, the impact of GenAI and automation is already pronounced. Many sectors have adopted these technologies to optimise operations and improve efficiency. In manufacturing, automated assembly lines and robotic systems have revolutionised production processes, reducing the need for human intervention in repetitive and hazardous tasks (Autor 2015). In health care, AI-driven diagnostic tools assist doctors to identify diseases more accurately and at earlier stages, thereby improving patient outcomes (Jiang et al. 2017). Financial services also leverage AI for tasks such as fraud detection, risk assessment and algorithmic trading, showcasing the technology's versatility and deep integration into critical workflows (Davenport & Ronanki 2018).

One significant aspect of this pervasive integration is that the uptake of GenAI and automation has often been gradual and unexamined. As these technologies evolve and become more user-friendly, their adoption has extended beyond tech-savvy individuals to the broader population. For instance, smart home devices such as voice-activated assistants and automated lighting systems have become commonplace, providing convenience and efficiency without users necessarily considering the underlying technologies (West 2018). This trend indicates that GenAI and automation are not just tools for specialised applications but are becoming integral to the way people live and work.

The seamless incorporation of these technologies raises important considerations about the future of work and daily life. While the benefits of increased efficiency and productivity are clear, there is a need to consider the implications of such widespread adoption.

Issues such as data privacy, cybersecurity and the potential displacement of jobs must be carefully managed to ensure that the advantages of GenAI and automation are realised without unintended negative consequences (Eubanks 2018). These concerns were juxtaposed against excitement around the individual and bespoke creative opportunities that GenAI systems give rise to.

Several composers were excited by the idea of training AI systems on their own back catalogue of works to essentially create an automated AI assistant composer familiar with their musical voice and style. GAS-005, a composer, is very interested in using a GenAI that is only trained on their own work:

> I suffer like anyone else from writer's block, more often than not, exactly when I need to not be suffering from writer's block … If you can give me a piece of software that is trained off me, that I could say, I don't know, I need something that's in my house style, make me something, and a piece of software could spit back at me a piece of music that sounds like me that I could go, oh, that's exactly like I would do it. And that gives me a kick-off point for the next thing. That would save me an incalculable amount of time. (GAS-005)

Such creative shortcuts and tailored use of GenAI may allow creatives to produce more work in a shorter amount of time, potentially expanding their productivity alongside their list of potential clients.

Our participants' mixed feelings described above highlight the need for a balanced approach that maximises the benefits of GenAI while addressing its potential drawbacks. Ensuring transparency in AI training processes, safeguarding intellectual property rights, and promoting ethical AI practices will be crucial to fostering an environment where both technology and human creativity can thrive (Floridi 2023). Policymakers, industry leaders and educators must work together to create frameworks that support ethical AI deployment and prepare the workforce for the changes these technologies bring (Brynjolfsson & McAfee 2014).

'Crunch' and the incentivisation of AI in the Australian games industry

The games industry at large suffers from a culture of time pressures and a constant need for increased productivity (Cote & Harris 2023). While the Australian games sector – which is dominated by smaller, largely independent studios (Banks & Keogh

2021, p. 162) – may not be as susceptible to such issues as major AAA studios overseas (Banks & Keogh 2021; Cote & Harris 2021), it is not immune from economic pressures, driving a need for increased productivity, faster turnarounds and stringent budget management. As a result, and as our research participants alluded to, the industry is increasingly turning to GenAI and other forms of automation to meet these demands:

> I think the world is becoming more and more pressured in a lot of ways. We're constantly needing to deliver on KPIs. To tie it back to the games industry, like 10 years ago, there were five games launching a week. Now it's like 40 games launching a day ... The pressures of having to get results and having to reach those results are incredibly stressful ... If you can generate an image [for a marketing campaign], why are you going to pay a couple of hundred dollars for a graphic designer to do it? (NAS-003)

> If it's for professional work, I honestly tend to go straight to the computer with a MIDI keyboard, simply because if I can capture the idea immediately and have it recorded and it's less of an ideation process and more of an, okay, here's the thing. I'll change a few things, but this is pretty much it because of time [restraints] ... But if it was the equivalent of getting paid per painting I did, and it was a commission, I probably would use it [GenAI] just as that way of skipping through. [A] good analogy is if I'm going to do a rejection email for somebody who's applied for a job ... If I can have a template for that and just send that out, I don't need to do the brain work of writing that email every time. (NAS-007)

> if it turns out that you can, you know, you'll do some studies, you'll do your AB testing and stuff, you'll do some AI art, you'll get some bespoke stuff. And if the AI art performs well enough to justify saving the budget on it, then they'll do that. (GAS-001)

This trend is largely fuelled by the necessity to cope with 'crunch': 'a period of unpaid overtime meant to speed up lagging projects' (Cote & Harris 2021, p. 161), characterised by intense workloads and tight deadlines that require expedited workflows and enhanced efficiency. Automation and GenAI offer solutions to these challenges by potentially streamlining processes, reducing human error, and accelerating development timelines (IGEA 2022; Ryan 2023), as our participants stated:

Especially with deadlines always being as short as they are, I think a lot of automation can help to focus on the more creative aspects and more decision-based aspects in that regard. (GAS-003)

Traditionally, like in the game studio, you're on tight timelines, you're on tight budgets. And I mean, really what determines how much of that you do, versus hand-authored content ... How much time and attention really can I pay to this? Can I afford to make a small mistake here or, like, something that may not be perfect here or what have you? So, I think that really plays a big part into changing that decision on the sliding scale of how much am I willing to automate or how much do I have to automate or use AI for things just to get what I need to do done. (GAS-012)

The cultural problem of 'crunch' within the games sector is therefore accelerating the uptake of GenAI and automation, often without due consideration to the possible implications.

One of the primary concerns is the devaluation of 'quick work'. In the context of game development, many interviewees perceived tasks completed rapidly with the aid of GenAI as less valuable than those done through established methods. This perception can undermine the morale of developers who rely on these technologies to meet deadlines, creating a dichotomy between the necessity for speed and the appreciation of skilled expertise. Additionally, some participants compared the integration of GenAI into game development to the phenomenon of 'fast fashion' (Bick, Halsey & Ekenga 2018):

'the fear that I have going forward for a lot of creative forms is I feel like this is going to be the fast fashion of art and of text' (GAS-010).

Low-quality outputs of GenAI and its homogenising effects.

Much like the fashion industry, where the quick production of clothing suited to oft-changing seasonal trends has led to concerns about quality, sustainability and ethical practices (Niinimäki et al. 2020), the games sector faces similar issues with the introduction of GenAI and other expedited labour practices. The push for rapid production facilitated by the combination of 'crunch', exploitative labour practices (Cote & Harris 2012, 2023), and GenAI may result

in games that are less polished, innovative or even finished, as the focus shifts from quality to quantity. This analogy underscores the potential long-term consequences of prioritising speed over substance, which could impact the reputation and sustainability of the industry (Levine 2024). Such concerns have already been raised as to the current quality of games following the boom and bust provoked by the COVID-19 pandemic (Ball 2024; Carpenter 2024). The integration of GenAI and other forms of automation may exacerbate these broader industrial issues.

Concerns regarding the quality of GenAI outputs were expressed by our interviewees:

it's almost like it's empowering for creators in the wrong way, and it's disempowering for consumers to not even realise that they're not getting the value they think they are. (GAS-011)

I think that audio is in this weird position where it's already been dismissed so much … So, you know, like, I think this idea of using, you know, royalty-free sound effects, even though you've got bespoke animation … that happens all the time using royalty-free songs. And then you play two games, and they've got the same track. Audio has already been in this position where it's been dismissed and almost replaced or not valued … I think that more companies who already had that opinion of, 'We'll just use royalty free sound effects' will potentially start thinking and have already started thinking like, 'We'll just use AI to create art, and we'll just use AI to fix our programming'. (NAS-007)

While AI systems can produce content at a scale and speed that far surpasses human capabilities, the quality of this content frequently falls short of professional standards. This is particularly evident in creative industries such as writing, music and visual arts, where the outputs generated by AI often lack the depth, originality and emotional resonance that are hallmarks of human-created work. As some participants stated:

I think if, like, the high-end commercial AAA companies were to start going, 'We don't need concept artists because we can just use AI', that's incredibly disempowering. Because I think it will very quickly result, and we already have seen in the AAA industry a kind of lack of innovation. Like they don't want it. They're averse to taking risks because there's a lot riding on their

high budgets. And it's a lot of the indie scene that's kind of pushing these more innovative ideas.

I do have fears of it doing things to the industry as a whole. I worry about how AI is going to be used to replace scriptwriters, replace audio creators ... Generally, my fear is that it will do that, which will, like, impact people's lives and make the products worse. Just for the sake of saving money. Yeah, it's hurting both sides ... (NAS-004)

For instance, AI-generated creative works might adhere to technical patterns but fail to evoke the same emotional response as a work created by a skilled and experienced artist/creative (Elgammal et al. 2017). The Australian games and audio professionals interviewed for our project expressed several concerns relevant to quality of output, and overall doubts regarding the capacity of GenAI creative outputs to meet the same level of quality expected within their professional fields.

The low quality of GenAI outputs can be attributed to several factors. One primary reason is that AI models are trained on existing datasets, which may contain biases, inaccuracies and a lack of diversity. Consequently, outputs reflect these limitations, resulting in content that is often repetitive, biased or simplistic. Additionally, AI lacks the intrinsic human ability to innovate and think creatively, which is essential for producing high-quality artistic and intellectual work. This limitation is a significant barrier to the adoption of GenAI in fields that require a high degree of creativity and innovation.

Additionally, some participants associate GenAI with 'bad actors' who may use the technology unethically:

So, like, I see a lot of crypto-type people who have moved on to the AI thing. And then I suppose that creates a distrust for everyday people who don't necessarily follow the space because they sort of just look at who is flocking over to that sort of technology. And then they just have a general distrust regardless of the technology itself being quite agnostic. (GAS-002)

This concern is rooted in the potential misuse of AI-generated content for malicious purposes, such as deepfakes, misinformation campaigns or unauthorised impersonations. The ability of GenAI to convincingly replicate human voices and create realistic content can be exploited to deceive and manipulate audiences, leading to a loss of trust in digital media and increasing the risk of reputational damage for individuals and organisations (Gillespie 2018).

GenAI is still in its nascent stages of development, and this early phase has been marked by a range of challenges and limitations. One significant issue that participants highlighted is the problem of AI inaccuracies, often referred to as 'hallucinations' (Ayala & Bechard 2024). These hallucinations occur when AI models generate content that is incorrect, nonsensical or misleading, which raises serious concerns about the reliability and trustworthiness of these technologies. For example, in applications such as automated writing or content creation, GenAI may produce text that appears coherent but is factually inaccurate or contextually inappropriate, undermining its utility and potentially causing harm if such content is relied upon without proper verification (Bender et al. 2021; Marcus & Davis 2019).

The issue of hallucinations is particularly problematic because it can lead to the dissemination of false information, which is a significant risk in areas where accuracy is critical, such as journalism, legal documentation and educational materials, including academia and peer-reviewed research. This problem underscores the need for robust mechanisms to verify and validate AI-generated content before it is published or used. The occurrence of hallucinations also highlights the current limitations of GenAI in understanding and processing complex, nuanced information in the same way that humans do. This limitation is a reminder that, despite rapid advancements, GenAI is far from being a flawless technology and still requires substantial improvements to reach its full potential (Brundage et al. 2020).

One of the primary ethical concerns expressed by our interviewees is that GenAI often does not create genuinely new products but rather assimilates and homogenises pre-existing works, which is then re-integrated within AI modelling, creating a self-reinforcing homogenising effect in terms of both production and consumption practices (Laak et al. 2024; Zhu et al. 2024). Some participants acknowledged the homogenising, generic effect such practices might have on sound and audio design:

everything's so perfect, pitch perfect and beat perfect ... I don't understand what most people are listening to, and I don't understand why they're listening to it ... people seem to really like easy, accessible and disposable ... So, I think most people wouldn't even notice that the robots had taken over and would just grab it. Cause I mean, people are just looking for sound bites to put over videos nowadays and like little samples. (GAS-007)

My main feeling is that of resignation at the moment. So, I should be feeling hopeful and happy because anything that improves our skills is a good thing. It's just that I've seen ... you're probably well aware that when

you use the large language models, you're getting what's at the top of the web, you're getting the most popular answers ... it is important for us all to be the same page and understand each other but it does lose you lose your individuality and your creativity. (NAS-001)

This process can amount to what many consider theft or copyright infringement (Susarla 2024).

It is evident from our interviews that economic pressures and a culture of crunch in the games sector, both locally and internationally, are driving a rapid uptake of GenAI and automation, offering solutions to productivity and turnaround challenges. However, this shift brings with it a set of complex issues, including the devaluation of work and concerns about job security and industry sustainability. As the sector navigates these changes, it will be crucial to balance the benefits of technology with the need to maintain quality, innovation and ethical standards in game development.

Authenticity, creativity and GenAI

Interviewees widely perceived bespoke, human creation to be more authentic and of higher quality than outputs generated by AI. Specifically, our interviewees emphasised that AI tends to produce 'quick and cheap' results that often lack the depth, nuance and originality that characterise human-created works. This perception underscores a fundamental distinction between AI-generated content and human creativity, with the latter being valued for its personal touch, attention to detail and emotional resonance (Mazzone & Elgammal 2019).

This preference for human-centred, 'hand-made' work stems from the belief that such creations embody the artist's unique perspective, skill and creativity. Human creators draw from their own experiences, emotions and cultural contexts, infusing their work with a level of authenticity and individuality that GenAI, which relies on pre-existing data and patterns, struggles to replicate. This authenticity is not just a matter of artistic quality but also an ethical consideration, as it honours the effort and creativity of individual artists, and their cultural, socio-economic and ethnic backgrounds. Our research participants consistently expressed a preference for this kind of authentic work, suggesting that the personal investment and narrative behind human-created art holds significant value.

Furthermore, participants raised concerns regarding whether audiences would connect with work primarily produced by GenAI. Participants framed the role of the artist as central to creating a point of connection and empathy with audiences. Human-created

work, imbued with the artist's personal touch and emotional depth, can resonate on a deeper level with viewers or listeners. This connection is integral to the appreciation and interpretation of art, as audiences often seek to understand the intentions and experiences of the creator and are often invested in authors and creators as objects themselves. In contrast, audiences may struggle to establish the same emotional and empathetic bonds with AI-generated content.

The preference for human-authored work amongst our participants highlights broader aesthetic values that prioritise originality, authenticity and emotional engagement, despite extensive scholarly debate as to what qualifies as 'authentic' (Newman & Smith 2016). These values are not easily replicated by AI, which, despite its ability to produce a high volume of content quickly, often falls short in delivering the nuanced and contextually rich outputs that human artists/creatives provide. This is particularly relevant in fields such as literature, music and visual arts, where the emotional and intellectual engagement of the audience is paramount. The scepticism about GenAI's ability to generate meaningful connections with audiences suggests that, while AI may serve as a tool to assist in creative processes, the human element remains irreplaceable (Marcus & Davis 2019).

In addressing these concerns, it is crucial for developers and users of GenAI to recognise the limitations of these technologies and to focus on complementing rather than replacing human creativity. This approach involves leveraging GenAI to handle repetitive and mundane tasks, thereby freeing up human creators to focus on the more intricate and expressive aspects of their work. Such an approach was consistently supported by our interviewees. By positioning AI as a supportive tool rather than a substitute for human talent, the creative industries, and the games and audio sectors alongside them, can harness the benefits of technology while preserving the authenticity and quality that audiences value (Newman & Smith 2016).

The differing perceptions of established automation versus GenAI also raises important questions about the boundaries between these technologies. Where should the line be drawn between acceptable automation and the encroachment of AI on creative and decision-making processes? Established automation is typically seen as a tool that extends human capabilities without replacing the unique elements of creativity and critical thinking. In contrast, GenAI's ability to generate content, ideas and solutions autonomously challenges the notion of human authorship and originality (Floridi & Chiriatti 2020). This blurring of lines prompts a re-evaluation of the roles that humans and AI should play in various professional domains, especially creative industries such as games and audio.

Generative AI also holds significant potential to enhance resources and productivity. Over half of our participants indicated that AI and automation have the potential to allow them more time to dedicate towards creative tasks by automating the more tedious and repetitive aspects of their workflows. By offloading mundane tasks to AI and other automated systems, workers can focus on higher-order problem-solving and strategic thinking, ultimately leading to more innovative outcomes and a more engaging work experience (Bessen 2019; Brynjolfsson & McAfee 2014).

Many participants, even those who were initially hesitant about using GenAI, recognise its value in scenarios where time or budget constraints are significant. In such circumstances, the ability of GenAI to rapidly generate solutions, content and insights becomes a crucial asset. For instance, in fast-paced industries like marketing or content creation, GenAI can quickly produce drafts, outlines and even polished pieces, allowing human workers to refine and perfect the output rather than starting from scratch. Such advances in ideation have obvious appeal for the games sector, as this not only speeds up the production process but also ensures that projects can be completed within tight deadlines and limited budgets, improving feasibility (Shestakofsky 2017).

GenAI's capacity to enhance productivity is also evident in its ability to enable teams and individuals to deliver more than would be feasible without assistance. This was a common point of commentary amongst our interviewees. By leveraging GenAI, organisations can scale their operations without a corresponding increase in human labour costs. This is particularly beneficial for small and medium-sized enterprises – such as small, independent game studios – that may lack the resources to hire additional staff but still aim to compete with larger companies and projects with larger budgets. This not only improves client satisfaction but also maximises the productivity of the existing workforce (Huang & Rust 2018).

The transformative potential of GenAI extends beyond mere productivity gains; it also paves the way for new business models and opportunities. For instance, AI-driven data analysis can uncover trends and insights that inform strategic decisions, leading to more targeted marketing campaigns and optimised resource allocation. By harnessing the power of GenAI, game and audio firms can not only streamline their operations but also innovate and adapt in a rapidly changing market landscape (Agrawal, Gans & Goldfarb 2018). While there has been widespread and well-founded initial reluctance to adopt GenAI, the benefits such systems potentially offer in terms of enhancing productivity, expanding creative potential and enabling more efficient resource utilisation are difficult to deny. The key lies in striking a balance where GenAI is seen as an empowering tool that complements human capabilities, rather than a replacement, thereby fostering an environment of innovation and growth (Bessen 2019; Brynjolfsson & McAfee 2014).

Furthermore, the ethical implications of GenAI's deployment remain a contentious issue. The potential for bias in AI algorithms, the lack of transparency in decision-making processes, and the possibility of job displacement raise questions about whether the benefits of GenAI truly outweigh the drawbacks. It is crucial to approach the adoption of GenAI with a balanced perspective, ensuring that its implementation is guided by ethical considerations and a commitment to preserving human agency and creativity (Floridi et al. 2021).

Findings: Equity, access and inclusion

Fair compensation and intellectual property

GenAI systems are typically trained on vast datasets that include copyrighted material, which is then used to generate new outputs. The creators of the original content often do not receive recognition or compensation for their contributions, highlighting the potential for GenAI to undermine the intellectual property rights of creators, further exacerbating preexisting issues of exploitation and unfair practices within the creative industries (Brook, O'Brien & Taylor 2020; Hesmondhalgh 2018). Games and audio professionals invest considerable time and resources into creating high-quality content that drive the success of their projects. When AI systems are trained on this copyrighted material, they benefit from the cumulative knowledge and creativity of these individuals. Therefore, it is only fair that the original creators receive appropriate remuneration for their contributions. This approach not only acknowledges their work but also incentivises continued innovation and creativity within the industry.

Fair compensation for creators whose work is used to train AI datasets is a widely accepted principle in the Australian games and audio sectors, according to our participants. This consensus stems from recognition of the significant effort, creativity and expertise that goes into producing original content. As AI technologies, particularly GenAI, become more integrated into these industries, ensuring that creators are fairly compensated is crucial to maintain the sustainability and ethical integrity of the creative ecosystem (Sadowski 2019).

The call for fair compensation is also driven by concerns about the potential for systemic exploitation. Without proper compensation and licensing mechanisms in place, there is a risk that AI companies could profit disproportionately from the labour of individual creators. This scenario could lead to a concentration of wealth and power in the hands of a few technology firms, exacerbating existing inequalities (Brook, O'Brien & Taylor 2020; Hesmondhalgh 2018). Ensuring fair compensation helps to mitigate these risks by redistributing the economic benefits of AI more equitably across all stakeholders (Crawford & Joler 2018; Zuboff 2019). Moreover, fair compensation is essential for fostering trust between creators and AI developers.

Transparency regarding how AI systems are trained and how the resulting profits are shared will also build confidence among

creators that their work will not be used unfairly. This trust is crucial for encouraging collaboration and for the continued development of GenAI technologies that respect the rights and contributions of all involved parties. As creators see that their work is valued and fairly compensated, they will be more likely to engage with AI technologies and contribute to their development (Gillespie 2018; Pasquale 2015). Further, the extractive nature of the most popular GenAIs – systems trained on vast amounts of data often collected without explicit consent – raises ethical red flags. In January, OpenAI allegedly said that it is '"Impossible" to create AI tools' without training them on copyrighted data (Milmo 2024). Workers worry that their creative outputs could be used without proper attribution or compensation, thus eroding the value of their work. This concern is particularly acute for freelance and independent creators, who may lack the resources to protect their intellectual property against unauthorised use by AI systems.

To implement fair compensation, the industry must establish clear guidelines and frameworks. These could include licensing agreements that specify the terms under which creators' works can be used, as well as royalty systems that ensure ongoing payments based on the usage of the AI systems trained on their work. Additionally, there should be mechanisms for monitoring and enforcing these agreements to prevent misuse and ensure compliance. Industry-wide standards, potentially supported by legislative measures, could provide a robust foundation for these frameworks (MEAA 2024).

Fair compensation for creators whose work is used to train AI datasets is not just an ethical imperative but also a practical necessity for continued growth and innovation in the games and audio sectors. Some GenAI audio firms and companies have already developed compensatory licensing and profit-sharing arrangements with contributing artists, such as Voice-Swap's artist agreements, which redirect 50% of pro-rata gross subscription income and 80% gross on licence income to the artists whose voices they use for training (Voice-Swap 2024). By valuing and rewarding the contributions of creators, the industry can ensure a more equitable distribution of the benefits of AI technology, fostering a more sustainable and collaborative creative ecosystem.

The need to support workers to reskill

The rapid pace of technological advancement, particularly in the realm of GenAI, has left many workers feeling overwhelmed and struggling to keep up. This sentiment was common amongst our research participants, who stated that the continuous emergence of new tools and systems demands constant adaptation and reskilling. The pressure to stay current and up to date with these technological changes can be daunting, especially for those who

have established expertise and now face the challenge of learning entirely new skill sets (Brynjolfsson & McAfee 2014; Frey & Osborne 2017).

Adapting to new technologies is not merely a matter of learning new software or tools; it often requires a fundamental shift in how work is approached and executed. Many games professionals, developers and studios have developed unique workflows and production pipelines tailored to their specific needs, creative processes, platforms and products. These bespoke systems are integral to their productivity and quality control, making any change or integration of new technologies potentially disruptive. As a result, there is a natural resistance to adopting GenAI, as it can necessitate significant alterations to established practices and processes. The fear of disrupting proven workflows and uncertainty regarding the efficiency and reliability of new technologies contribute to this reluctance, and many participants expressed similar concerns.

Furthermore, the integration of GenAI and other advanced technologies into work roles poses a particular challenge for workers with low technological or critical literacies. These individuals may find GenAI unapproachable, creating a barrier to entry in sectors increasingly reliant on such technologies. Workers and professionals who lack the necessary skills and knowledge may find themselves excluded from new opportunities, leading to inequality and reduced career mobility within the industry (Eynon & Geniets, 2016, van Dijk, 2017).

Providing training programs and resources to help workers reskill and upskill is essential in easing the transition to new technologies. Additionally, involving employees in the process of integrating new technologies can help mitigate resistance, as they feel more in control and better prepared for such changes. Although most – but not all – games audio professionals are freelancers who may lack the institutional support needed for formal professional development and on-the-job training programs, what these freelancers do have control over is their client lists. Many research participants expressed a preference for clients who demonstrated respect for bespoke work, which provoked these freelance professionals to carefully consider when to use or otherwise engage with GenAI and other automotive technologies. Such transparent communication between clients and freelancers regarding the benefits and potential impacts of GenAI can also alleviate fears and build trust within the workforce (Bessen 2019).

The rapid pace of technological change presents significant challenges for workers in adapting and reskilling, particularly in industries with unique workflows and production pipelines. The integration of GenAI and other advanced technologies must be approached thoughtfully to ensure inclusivity and to address the digital divide. By prioritising continuous learning,

transparent communication and involving employees in the transition process, organisations can better navigate the complexities of technological advancement while preserving the value of human expertise and creativity.

Bias, misrepresentation and appropriation of marginalised identities

Most of our participants expressed apprehension as to whether AI systems were ethically trained, reflecting broader concerns about data privacy, bias and the potential misuse of AI. The opaque nature of GenAI algorithms and datasets has left many of our participants feeling uncertain about the sources of data used for training and whether these datasets are representative and free from biases. This lack of transparency can lead to distrust and fear that the widespread adoption of GenAI might perpetuate existing inequalities or introduce new forms of exploitation (Crawford 2021; Floridi 2023).

In particular, the rise of GenAI technologies has profound implications for the representation of marginalised identities, highlighting the urgent need for specific and targeted research in this area. One critical concern is the potential misrepresentation and erasure of First Nations workers, professionals and artists. GenAI systems, which are often trained on large datasets predominantly composed of mainstream, Western-centric content, risk perpetuating existing biases and overlooking the rich cultural heritage and unique perspectives of Indigenous communities. This lack of representation can lead to the production of AI-generated content that fails to accurately or respectfully reflect the identities and contributions of First Nations people (Lewis 2020; Noble 2018).

Moreover, the use of GenAI in creative fields poses significant ethical questions regarding the ownership and attribution of cultural expressions. First Nations artists and creators have long struggled with issues of cultural appropriation and the unauthorised use of their cultural symbols and knowledge. GenAI, if not carefully managed, could exacerbate these issues by generating works that mimic Indigenous art and cultural artifacts without proper acknowledgment or compensation to the communities from which these cultural elements originate. Our participants also acknowledged cultural sensitivities around access to cultural resources and their use:

'working with, like, on First Nations Country and stuff, you need to get permission to actually go out on Country and find those sounds' (GAS-009).

This raises critical concerns about intellectual property rights and the need for frameworks that protect the cultural heritage and intellectual contributions of marginalised communities (Hudson et al. 2023; Smith 2021).

Similarly, the perspectives of professionals in rural communities regarding GenAI warrant careful consideration in future research. Rural professionals often face unique challenges, including limited access to technological infrastructure, fewer opportunities for training and reskilling, and economic dependencies on industries that may be significantly impacted by automation and AI. Rural interviewees also expressed feelings of professional isolation and disconnectedness:

> **out in the regions, because we don't have, you know, someone that we can just go and ask, like in Adelaide, we can just find the gang and be like, 'Hey, you did gaming, let's talk about it here.' We don't really have that. And so it's a lot harder as well to be, like, you know, am I allowed to still do this or do that? (GAS-009)**

Understanding the thoughts, feelings and experiences of these professionals is crucial for developing inclusive AI policies and strategies that do not exacerbate existing inequalities. Rural communities may have different needs and priorities, and these must be considered to ensure that the benefits of GenAI are equitably distributed (Philip et al., 2017; Salemink, Strijker & Bosworth, 2017).

The integration of GenAI in rural areas also presents opportunities and challenges distinct from urban settings. On one hand, AI technologies could help bridge some of the gaps in service delivery, health care and education, providing rural communities with access to resources that were previously out of reach. On the other hand, there is a risk that without adequate support and tailored solutions, the digital divide could widen, leaving rural populations further behind. Ensuring that GenAI technologies are adaptable and sensitive to the specific contexts of rural and regional life is essential for promoting inclusivity and reducing disparities (Robinson et al. 2020; van Dijk 2017). Furthermore, the ethical and social implications of GenAI must be scrutinised to prevent the reinforcement of stereotypes and biases that further marginalise otherwise disadvantaged communities. AI systems, if not carefully designed and implemented, can inadvertently perpetuate harmful narratives and exclude diverse voices. This underscores the need for inclusive design practices that involve marginalised groups in the development and deployment of AI technologies. By actively engaging these communities and prioritising their needs and perspectives, developers can create more equitable and culturally sensitive AI systems (Costanza-Chock 2020; Whittaker et al. 2019).

The implications of GenAI for the representation of marginalised identities, particularly First Nations workers, professionals and artists, as well as other communities, highlights the need for targeted and inclusive research. Addressing these issues requires a concerted effort to ensure that AI technologies are developed and deployed in ways that respect and reflect the diversity of human experiences and cultures. By prioritising inclusivity, transparency and ethical considerations, we can harness the potential of GenAI to benefit all communities, fostering a more equitable and just technological future (Lewis 2020; Noble 2018).

Perceptions and concerns in the games audio sector

Pessimism and optimism among games professionals

The advent of GenAI has stirred a spectrum of emotional responses among workers in the Australian games industry. The disparity of opinions is particularly pronounced when comparing audio professionals to their non-audio counterparts. While some of our participants – primarily non-audio games professionals – view GenAI as a powerful tool that can enhance productivity and efficiency, others see it as a potentially extractive and exploitative force that could disrupt established practices and job security. This sentiment was particularly pronounced amongst our games audio professional participants.

Audio worker participants, including composers, sound designers and voice artists, generally expressed more pessimism about GenAI than other professionals in the games sector. Their concerns stem from the fear that GenAI could undermine the unique creative processes and skills that define their work:

I would say negative, and the general feeling being probably fear and anxiety, specifically around job security. Yeah, yeah, and being replaced. (GAS-003)

why do we finally, you know, invent robots and, and they, they get to be artists and poets, uh, you know, uh ... Like, there's something I think, like, socio-politically. I think that it's very troubling to me that AI is essentially the tool of, you know, big business. Like, everything that exists that has this amount of development put into it and resources put into it is to make somebody somewhere financial gain. (GAS-001)

there's always gonna be people that try to exploit other people just by using AI tools. I suppose my speculation, or sorry, my stress of it is more just from, I suppose, specific subsets of people who use it. So, like tech bro type people who look at it as a money-making opportunity rather than a technological innovation. (GAS-002)

The thing that I think troubles me is how it might create less work for beginners. That's where it really worries me because the kind of people who've got very little budget and they're like, oh, look, you know, we could, you know, pay a beginner with, you know, we give them some rev share or something, or we could ... it's quite tricky searching for sounds, right? Still involves some expertise. And so, then I think that those people will likely turn to some, just yeah, generate me this sound. And that will sort of replace those sort of absolute beginner gigs for people. (GAS-001)

For these professionals, the composition of music and soundscapes and creating characters through voice acting is a deeply personal and complex process, involving a level of artistry they fear may not be replicable by AI or that GenAI may otherwise compromise. Their anxiety is that GenAI may produce or encourage generic, homogenised outputs that lack the emotional depth and original characteristics of human-created audio, sound and/or voice acting. This concern is compounded by the possibility of GenAI devaluing their original contributions, as automated tools may lead to a reduction in demand for human audio professionals (Acemoglu & Restrepo 2018).

Further anxieties have been raised as to the way in which GenAI is trained on data generated through extractive data-harvesting practices that are not properly acknowledged or remunerated. However, some games audio professionals expressed excitement regarding the creative capacities of new AI technologies, including interviewee GAS-013, who commented:

I used AI to alter my own voice. So, then it sounded like it was two different singers, and that guy's voice was really good. I was like, I think he, even though it was [mine], I saw it just like the tone of his voice. I almost liked it more than my own voice. (GAS-013)

Other participants adopted a more optimistic outlook on the potential of GenAI:

I'm personally quite optimistic. Like, yeah, I'm a bit anxious as well, just because of, um, not just the ethics around it, because I think that that's a different discussion from the technology existing. (GAS-011)

I think the act of creation is more important to me. I think that, for creative people, that sort of the pursuit

of creativity is the thing that makes us who we are. It doesn't matter how we express it. And I think AI can be a great way to express creativity. (NAS-005)

I feel excited for it because I feel there's been a stagnation. I feel that if you look from the 60s to the 70s, there was forward movement. You can hear a difference. If you look from the 70s to the 80s, there's a difference. 80s to 90s, there's a difference. 90s to 2000s, a difference in style. But suddenly the actual like forward progression to sonics starts to plateau out a bit … late 2000s to now, you could almost even interchange the songs and not hear a difference. Because I just don't think sonically there has been much of a change. I think AI is needed to push us in a direction that is actually forward so that we don't just end up with 50 years' worth of music that all just kind of sounds the same. (GAS-005)

The integration of automated processes and software that streamlines various workflows has been met with widespread acceptance across the Australian games sector, particularly in composition and sound design. Such processes include: quantisation of off-time notes to shift them on-beat; arpeggiators which cycle through the keys you are holding down on a keyboard using a pre-set pattern; and user-designed automation envelopes to slowly fade volume or other audio effects. This is in stark contrast to the reception of GenAI, which has generally been approached with hesitancy and a degree of suspicion by games and audio workers.

Participants perceived non-GenAI automated processes, tools and workflows as enhancements that support and empower creativity rather than hindering it. These technologies streamline repetitive tasks, allowing workers to focus on more complex and creative aspects of their jobs. Beyond the games, audio and creative industries broadly, studies show that automation technologies have been instrumental in boosting productivity and efficiency in industries such as manufacturing, health care and finance (McKinsey Global Institute 2017). The overall sentiment among our participants was that many of these automated systems are indispensable, integrating into their daily workflows and significantly boosting productivity.

In contrast, GenAI faces considerable scepticism and hesitancy from workers and professionals. Unlike traditional automation, which is often transparent in its functioning, GenAI is perceived as a 'black box' (Bearman & Ajjawi 2023):

automation is something that I use a decent amount because, well, I guess, cause I'm a programmer as well as an audio person. So, it just seems to sort of make sense. There's a lot of stuff in sound and music that we do that's really repetitive, busy work. And especially instead of just running a business, there's a whole lot of very repetitive, busy work … [whereas] my understanding of AI is that it's sort of, it's a bit of a black box. (GAS-001)

I think AI in my perception of things is a system that can analyse and recognise patterns and reproduce them in a way. So, any system that can basically be used to process large amounts of data, identify it … Automation is, to me, would be just the concept of … reducing the manual labour of processing something. (SDE-001)

Research participants used the term 'black box' to imply a lack of understanding and visibility into how GenAI systems operate and make decisions. Research indicates that the complexity and opacity of GenAI algorithms contribute to a sense of mistrust, as users are uncertain about the underlying mechanisms and potential biases that may influence the outcomes generated by these systems (Brennen, Howard & Nielsen 2018). This was reflected in our research:

the mass data ingest and the black box nature of AI is what makes it sort of funky to me as a creative tool because it's taking something that is just taking the end result, like the output, as opposed to the process that gets you there. (GAS-008)

Such hesitation sat in contrast to the use of other, non-GenAI automated tools, with the same participant stating: 'I know what all of my [automation] chains and things do … I know what the end result is going to be' (GAS-008).

Our interviewees' apprehension around GenAI was also compounded by concerns about job displacement and the possible erosion of human creativity and intuition within the Australian games/audio sector. However, some participants also expressed doubts regarding current fears surrounding the application of GenAI in creative practice:

I was thinking about this, like, ages ago when all these ideas of, like, okay, AI is just creating, you know, it's

creating its own music. There won't be jobs for creatives and things. And I was wondering like, were the same conversations happening when, like, synthesisers had arpeggiators in there or something? It's like, oh, piano players, they're not gonna exist anymore. (NAS-007)

One is that I think it's a little bit overhyped, so I get a little bit frustrated at that. When they tell me that I'm gonna lose my job because AI will do it for me, I'm like, no it won't. I've seen what it does. No, it won't. (NAS-002)

I think with this kind of technology or really like any significant technology, we've been proved time and time again that speculation is often incorrect, and stuff does not unfold in the way that we anticipate. So, until I see problems or being, impacting me negatively, I'll have a hard time believing that that's really gonna happen. (GAS-013)

As the adoption of GenAI continues to grow, it will be crucial to address these concerns through increased transparency, education and ethical considerations. Ensuring that GenAI systems are understandable, and that their decision-making processes are explainable, will help build trust among users (European Commission 2020). Additionally, emphasising the collaborative potential of GenAI – where it acts as an assistant rather than a replacement – will alleviate fears of redundancy and reinforce the value of human creativity (IBM Watson 2021). Ultimately, the successful integration of GenAI will depend on striking a balance that respects and preserves the unique contributions of human professionals while leveraging the transformative potential of advanced AI technologies.

Taboos and potential ostracism

The integration of GenAI into the games and audio sectors has introduced new technological possibilities, but it has also brought about a range of social challenges. Some audio professionals, specifically voice actors but also composers and sound designers, who are interested in exploring the potential of GenAI feel constrained by an environment wherein discussing such interests openly is frowned upon:

there's a lot of people who are so deeply against [GenAI] within the VO [voice-over] community. (GAS-014)

I suppose the industry is quite tight knit. So, most people in [our state] know each other to some degree, or they know someone who knows someone. So I feel like everyone's sort of two people separated at most. So, in terms of community there, I feel like people who are completely anti-AI will definitely pass along information that you use AI art or something in your own game dev. (GAS-002)

This sense of taboo can create a stifling atmosphere where innovation and curiosity are suppressed due to fear of ostracism:

there's like this feeling of like dread and despair, just like completely swirling around our entire creative field of people. And it's just like, but it doesn't need to be like that. We just need to have the right discussions, and we can't have the right discussions if everyone's hair is on fire. (GAS-011)

Several participants indicated that speaking openly about GenAI within their professional communities might lead to exclusion or professional marginalisation:

If I talked about some of the projects that I've done, even though they were safely and ethically, and the contracts were great, and I'm looked after and I feel perfectly fine about it, if I were to even mention those to some people in my community, I would probably be dead to them. Yeah, that's how strongly people feel about this because they simply don't understand … I had a conversation with a colleague recently who is kind of in the same boat as me. We didn't realise that we felt the same because we felt like we couldn't talk about it. Because we didn't know who we could talk about it to. (GAS-011)

This reluctance to engage in open dialogue about GenAI stems from a variety of factors. For certain creatives, there is a concern that embracing AI technologies might be seen as a betrayal of their traditional creative skills. The audio and digital games sectors, like many other creative fields, place a high value on human skill, creativity and the artisanal quality of work produced by professionals. The use of GenAI can be perceived as undermining these values, reducing the role of creativity and replacing it with automated processes. This perception can create a polarised environment where advocates for GenAI are viewed as undermining the foundation of the craft. Furthermore, there is a fear that GenAI could lead to job displacement, which adds to stigma

surrounding the technology. Many audio and games professionals are concerned that GenAI could render their skills obsolete, leading to a loss of livelihood. This anxiety can foster a culture of resistance against GenAI, where even discussing its potential benefits is seen as threatening. In such a climate, professionals who are curious about or supportive of GenAI may find themselves at odds with their peers, risking social and professional isolation.

Taboos surrounding GenAI also impede constructive discussions and knowledge sharing that are essential for technological advancement and ethical considerations. When professionals feel they cannot speak openly about GenAI, it limits opportunities for collaborative exploration of such technologies. This lack of dialogue can hinder the development of best practices and ethical guidelines for integrating GenAI into the audio and digital games sectors. Without open conversations, misconceptions and fears about the technology remain unchallenged, potentially slowing down its responsible adoption (Turkle 2017; van Dijck, Poell & de Waal 2018).

To address these issues, it is crucial to foster an inclusive and open-minded environment where discussions about GenAI can take place without fear of judgment or exclusion. Industry leaders and organisations can play a pivotal role in facilitating these conversations by organising forums, workshops and panels that encourage dialogue about the benefits, challenges and ethical considerations of GenAI. Creating safe spaces for discussion can help demystify the technology and reduce the stigma associated with it, allowing professionals to explore its potential without fear of backlash (Edmondson, 2012; Elving 2005). Moreover, promoting education and awareness about GenAI can help bridge the gap between traditional audio practices and emerging technologies. By providing training and resources that highlight how GenAI can complement and enhance human creativity, rather than replace it, the industry can alleviate some of the fears associated with AI. Emphasising the collaborative potential of GenAI, where human ingenuity and AI capabilities may work in tandem, can help shift the narrative from one of threat to one of opportunity (Goldin & Katz 2008; Westerman, Bonnet & McAfee 2014).

Taboos surrounding GenAI in the audio and digital games sectors highlight the social challenges that accompany technological advancements. Overcoming these taboos requires fostering open dialogue, providing education and promoting a collaborative approach to technology integration. By addressing the fears and misconceptions associated with GenAI, the audio industry can create an environment where innovation thrives and professionals feel empowered to explore new technological frontiers without fear of ostracism.

Concerns about job security

A significant point of apprehension amongst our participants is the potential for GenAI to replace key roles and professions within the industry. While GenAI can enhance productivity and creativity, there is an underlying fear that it might render certain jobs obsolete. This concern is particularly pronounced in fields where human creativity and intuition are highly valued, as there is a perceived risk that over-reliance on AI could diminish the role of human input and expertise (Shestakofsky 2017).

The belief that AI will replace jobs was a pervasive concern among our interviewees. This trend is particularly troubling in industries that rely heavily on creative and personalised work, such as voice acting, writing and design. While some argue that AI will create new opportunities and roles, the transitional period may be fraught with challenges, including economic displacement and the need for extensive retraining and upskilling.

Rapid advancements in GenAI have introduced significant ethical dilemmas and concerns about job security in the Australian games sector, particularly in professions like voice acting. AI systems can now generate human-like voices with remarkable accuracy, reducing the need for human voice actors. The automation of voice-over work by AI technologies therefore poses a serious and genuine threat to the livelihoods of these artists. This automation trend not only jeopardises individual careers but also raises broader questions about the future of creative professions and the ethical implications of replacing human talent with machines (Crawford 2021).

The growing reliance on GenAI also raises questions about the future of creative roles within the sector. As roles are streamlined via automation and the integration of more powerful forms of GenAI, there will be an inevitable shift in the landscape of the games industry, with some roles becoming obsolete while new ones emerge. This transition necessitates a strategic approach to workforce development, ensuring that professionals are equipped with the skills needed to adapt to an increasingly automated environment.

A reluctance to adopt new technologies is also fuelled by concerns about the implications of these changes for professional identity. As GenAI and automation become more prevalent, workers fear that their roles may be rendered obsolete or devalued. This fear is particularly acute in creative fields, where the human touch and personal creativity are highly prized. The notion that AI could replace human creativity and intuition can be demoralising, leading to resistance not just on a practical level but also on an emotional and psychological one. This was reflected in our participants' responses:

[some companies may say:] 'We're letting our artists go because we've had, you know, financial concerns, we won't be replacing our mid-level 2D artists, but then we use AI to work off their drawings, their drawings as data. And then we haven't hired anybody, but we've had them replaced.' (NAS-007)

To address these challenges, it is crucial for organisations and industry leaders to foster a culture of continuous learning and adaptation.

Loss of collaboration and community

The increasing prevalence of GenAI technologies in various industries has sparked concerns about the potential loss of community and collaboration among professionals. Several participants articulated fears that the widespread adoption of GenAI could lead to a reduction in collaborative efforts across the sector. This reduction in collaboration may undermine the sense of professional community and identity that is crucial for fostering innovation, knowledge sharing and collective problem solving. The communal aspect of work, particularly in creative industries such as digital games, musical composition and sound design, plays a significant role in maintaining a vibrant and supportive professional environment (Hinds & Mortensen 2005; Sawyer 2017).

Collaboration is often the bedrock of creativity and innovation. In sectors like game design, creative writing and music production, the process of bouncing ideas off one another, providing constructive feedback and co-creating projects is essential for producing high-quality and original work. The integration of GenAI, which can automate and streamline many aspects of these creative processes, might inadvertently reduce the opportunities for such interactions. This was reflected in this participant's comment:

I really like working with people. Um, so, you know, it's, it's hard to say it's an ego thing. Cause it's not like I want to have, I don't want to do all the music. I don't want to do all the art, but I like working with people who do that stuff. And handing that over to a machine, like, I can't be friends with the machine … I want to work with someone who's going to come in and completely shake up the way, you know, our project works. (NAS-006)

As AI systems take on more tasks that previously required teamwork, the need for human collaboration could diminish, leading to a more isolated and fragmented work environment (Sawyer 2017).

This shift could also result in the erosion of institutional knowledge and specific creative skills that are typically passed down through mentorship and collaborative work. Institutional knowledge, which includes the unique practices, techniques and cultural norms of an organisation, is often shared and preserved through interpersonal interactions and collective experiences. Some participants had already observed the rise in such issues:

> I've been hearing a lot of horror stories of people who, you know, end up working with someone who says they got all these skills and then they get there, and they get in the room together and next minute they're relying on the AI-like program to do it for them … I had a situation where they had like an open night and [one team was presenting] their game, but the person couldn't really explain their concept without having [ChatGPT] do it for them. (GAS-009)

As GenAI reduces the need for collaborative work, there is a risk that this valuable knowledge may not be adequately transferred to new or less experienced members of the community. The loss of these informal but critical learning opportunities could weaken the overall skill set within the sector and hinder the development of new talent (Brown & Duguid 2001). Furthermore, the potential decline in collaboration could impact the sense of belonging and professional identity among workers.

A strong sense of community within a profession fosters mutual support, shared goals and a collective identity. This communal bond not only enhances job satisfaction but also contributes to the resilience and adaptability of the workforce. If GenAI leads to more isolated working conditions, professionals may feel less connected to their peers, reducing the overall cohesion and solidarity within the sector. This can have broader implications for morale and motivation, potentially leading to higher turnover rates and a decline in job satisfaction (Baumeister & Leary 1995; Wenger 1998).

The specific creative skills that are honed through collaboration, such as brainstorming, critical feedback and adaptive problem solving, may also suffer. These skills are essential for pushing the boundaries of what is creatively possible and for maintaining a high standard of work. As GenAI systems handle more of the routine and technical aspects of creative production, there is a danger that professionals may become overly reliant on technology, leading to a decline in their ability to perform these critical collaborative functions independently (Sennett 2008).

In addressing these concerns, it is crucial for organisations to find a balance between leveraging the efficiencies of GenAI and preserving the collaborative spirit that drives innovation and

community. Encouraging hybrid work models that integrate AI while promoting team-based projects and regular peer interactions can help maintain a healthy balance. Additionally, investing in training and development programs that emphasise the importance of collaboration and community building can mitigate some of the potentially negative impacts of GenAI on professional relationships and institutional knowledge (Edmondson 2012; Isaacs 1999). Unionisation may also promote solidarity and collective identity in a sector that has traditionally and until recently been under-unionised (Keogh & Abraham 2024; Woodcock 2020).

While GenAI offers significant benefits in terms of efficiency and productivity, its widespread adoption poses risks to the collaborative culture and sense of community within the digital games sector. By proactively addressing these challenges and fostering environments that value both technological advancements and human connections, game firms and studios, alongside freelancers, can ensure that the benefits of GenAI are realised without compromising the essential elements of collaboration and community that underpin professional success and innovation in this sector.

Confusion: 'AI is a marketing term'

The term 'artificial intelligence' (AI) has become a pervasive marketing buzzword in the games and audio industries, leading to significant confusion among professionals regarding what GenAI actually is, and how it impacts their workflows:

> Look, the only thing for me is, like, everyone's calling everything AI, right, these days. It's like the buzzword. I think it's good to have a definition here because, like, I mean, there's so many tools and things, like, it's, it's almost a marketing term sometimes. (GAS-012)

> The industry as a whole, I think, has overused the term. The audio industry as a whole has overused the term AI for a lot of different components and products. There's a lot of things that say this is AI based. And I know based on both of our agreed definitions of AI, there's a lot of tools out there that are like AI based mixing that it's not. There's certain basic pattern recognition things that are happening, but it's not necessarily AI based, it's more automation based. And I think people are really slipping up on that a lot, usually intentionally though, usually it's a marketing thing. (SDE-001)

I do feel that's becoming harder and harder to do, especially given that, you know, most of these software companies are trying to integrate AI into their automation systems. Like I've heard new windows laptops have an AI keyboard button, which I'm sure is going to age terribly, but they're kind of going hard on it. (NAS-006)

This confusion stems from the broad and often indiscriminate use of the term 'AI' to describe a wide range of products, from basic automation tools to sophisticated AI-driven applications:

there's this thing in one of the iZotope multiband compressors that if you click it, it'll find the ideal crossover points for the different bands … Seem to recall on the top of the website. They throw the word AI around and I don't know if that's actually AI. (GAS-004)

I have some plugins that claim there's AI involved, which I am sceptical of, like some of the, um, [iZotope]. I don't know if they advertise it as that, but the AI mastering or things like that. I don't know if they really advertise like that anymore, but a few years ago, or machine learning, there were plugins saying, 'Oh, we're doing AI or machine learning.' (GAS-006)

As a result, many audio and games professionals find it challenging to discern the true capabilities and limitations of GenAI, which further hinders their ability to effectively integrate these technologies into their work processes.

One major issue contributing to this confusion is the lack of clear, consistent definitions and explanations provided by marketers and product developers. AI encompasses a vast array of technologies, including machine learning, neural networks, natural language processing and more. When companies use the term 'AI' without specifying which technologies are involved or how they function, it creates a knowledge gap for users. This gap can lead to unrealistic expectations or mistrust, as professionals may either overestimate the capabilities of AI tools or remain sceptical about their effectiveness (Marr 2018).

The ambiguity surrounding AI in the audio space is further compounded by the varying levels of technological literacy among professionals. Some may have a deep understanding of advanced AI concepts, while others might only have a rudimentary grasp. This disparity makes it difficult for industry-wide discussions and education on AI to be uniformly effective. The resulting confusion

can prevent audio professionals from fully leveraging GenAI tools, as they may not understand how these tools can be integrated into their workflows to enhance creativity and efficiency (Eynon & Malmberg 2021; Kaplan & Haenlein 2019). Moreover, the conflation of GenAI with other types of AI in marketing materials can obscure the unique characteristics and potential benefits of GenAI. Unlike traditional tools that focus on automation and data analysis, GenAI is specifically designed to generate new content. This distinction is crucial for audio and games professionals, as it directly impacts the creative process. Without clear differentiation, professionals may miss opportunities to use GenAI for tasks that it excels at, such as brainstorming new ideas, creating innovative soundscapes, or enhancing existing audio content with novel elements (Alaeddine & Tannoury 2021).

The confusion surrounding AI terminology also poses challenges for workflow integration. Audio professionals often rely on established workflows that have been honed over years of practice. Introducing new AI tools into these workflows requires a clear understanding of how the tools function and how they can complement existing processes. When the term 'AI' is used too broadly, it becomes difficult to identify which tools are genuinely beneficial and which might disrupt or complicate workflows. This uncertainty can lead to resistance to adopting new technologies, even when they have the potential to significantly improve productivity and creative output.

To address these issues, it is essential for marketers and developers to adopt more transparent and precise communication strategies. Clearly defining what specific AI technologies are being used, how they work, and what benefits they offer can help demystify AI for audio professionals. Additionally, providing educational resources and training can bridge the knowledge gap, enabling users to make informed decisions about integrating AI into their workflows. By fostering a better understanding of GenAI and its capabilities, the audio and games sectors can harness the full potential of these advanced tools to drive innovation and creativity.

Conclusion and recommendations

The creative industries broadly and the games, audio and sound design sectors specifically are reckoning with the advent of GenAI and other non-GenAI technologies of automation to differing degrees and with differing results. This broad range of diverse impacts was reflected in our research participants' responses. Meanwhile, these workers and professionals are also experiencing a range of complications arising from the integration of these new technologies into their workflows and processes. Many of our participants expressed doubts and concerns, especially those working in more creative fields such as composition and sound design, whereas other games professionals were optimistic about the impact of GenAI and other forms of automation. However, all agreed that these new technologies would have wide-ranging impacts on productivity, but also that many of these programs, software and tools were still in their early stages of development, and that many produced mixed or low-quality results.

Since we began this project in mid-2023, there have been significant developments in terms of the capacity and application of GenAI products across visual, musical and many other creative mediums. In just the last year, we have seen dozens of new AI companies and products enter the audio, sound design and music sectors, including the application of GenAI to composition and songwriting services; song-texting programs; sound and sample search engines; audio transcription services; audio, voice and speech synthesis; the use of AI for the editing of audio sources, mixing and mastering; and the integration of many other GenAI and other forms of non-GenAI automation applications into the production and composition of musical work (Goldmedia 2024, p. 16). Alongside this explosion of AI music products and services, we have also seen significant investment in these new technologies, especially as they apply to the production of creative work and the music industries (Goldmedia 2024, pp. 18–23).

Our research has engaged with practitioners, workers and professionals in the Australian games industry, primarily audio creators, sound designers and composers, but also other games professionals, to understand how they are approaching these new technologies, including the risks and possibilities to be considered. The responses were mixed, and these new technologies have generally been approached with scepticism, the acknowledgment that they may improve productivity, and the widespread belief that GenAI is both here to stay and will have wide-reaching implications for all sectors of work. Such implications are particularly pronounced in the creative and cultural industries in which the digital games, music and audio sectors are grounded.

Our participants agreed that the games industry, which is susceptible to 'crunch', increased turnarounds, and budget restraints, is incentivised to integrate GenAI and automation more readily and possibly without due diligence. The participants also agreed that fair compensation should be paid to creators and workers whose work is used to train AI. However, the interviewees also acknowledged that the application of these tools is still evolving and could be potentially revolutionary, with many expressing curiosities as to the depth and breadth of their potential application. The vast majority of our research participants also acknowledged that these new technologies will have significant impacts on productivity, but that the required learning curve and proper integration of these tools has yet to be properly addressed within the games and audio sectors.

Ultimately, our research provides a picture of a sector in flux, with many freelance or otherwise precariously employed workers trying to make the most of another wave of technological disruption. Our interviewees seem to have one eye on the dubious ethics of using these products, and another on their potential productive value. The creative industries, and the music and audio sectors in particular, have often been the first and hardest hit by new technological developments. While these developments may provoke many negative or otherwise disruptive effects, creative workers have always adapted new technologies towards unforeseen or otherwise unintended creative ends. However, what is clear from our research is that workers in these sectors feel strongly that the value they produce should be properly remunerated, and that this applies to both the use of pre-existing work to train AI datasets and work that integrates AI processes to produce new creative products. A tension then arises between what counts as AI-generated work and what is simply AI-assisted production and, more importantly, who benefits from such new forms of production. Such a tension will be difficult to navigate for policymakers, industry stakeholders and creatives themselves as they strive to create a model that works for both workers and businesses alike.

Recommendations for the Australian games industry and policymakers

Recommendations for the Australian games industry, relevant stakeholders, policymakers, government, and non-government agencies include:

- **Transparency and licensing:** Workers and industry professionals should be mindful of whether their creative work is being licensed or mined for data that may be used to train AI models. Firms and businesses should have transparent and publicly available agreements regarding the use of content, including remuneration arrangements if content is

used for AI training. Source/s of data used to train AI should be publicly disclosed, and this should be enforced with legal obligations. The development of a transparency mechanism to promote and ensure transparency for copyright owners across the AI lifecycle should be a priority.

- **Funding and resources:** The Australian games industry is currently experiencing a period of significant contraction, which is constraining resources and increasing the prevalence of "crunch". This may increase reliance on GenAI and automation at the expense of appropriately reskilling the workforce. The federal and state governments should consider new and expanded funding arrangements for the digital games sector to mitigate the effects of this contraction. This should also involve the development of robust strategies to preserve essential skills development opportunities for creative industries trainees and apprentices more broadly.

- **Education and training:** GenAI and other forms of automation are rapidly changing the way we work, both in the games, creative and cultural industries, and beyond. Current vocational and tertiary training pathways need to be expanded to include and account for the impact of these new technologies, as well as to improve digital and critical literacies generally.

- **"AI Hype":** The ACCC and/or other relevant regulatory bodies should review the potential mislabelling of new applications, plugins, and products as AI, in a similar manner to that of the US Federal Trade Commission's recently announced 'Operation AI Comply'. This would provide both clarity for professionals and consumers, and act as a deterrent for companies leveraging "AI Hype" to market their products.

- **Consent and compensation:** The use of content to train generative AI models should be subject to consent and compensation. Creators data should only be used for training generative AI under an opt in basis.. An AI licensing framework that aligns with the consent, credit and compensation tenets of the existing copyright regime should be implemented.

- **Protections for creatives:** The right of creators to their image, voice, movement and likeness requires legislative protection.

- **Control:** Any creator, rights holder or person who consents to their voice, likeness or creative output being cloned using AI technology should be able to, if they so

wish, have control over how, by whom, where, and what content their work is used for. The terms of such contract should not be changed, nor should such a contract be upsold for profit or on-sold to another entity.

- **Copyrights for humans, not AI:** Copyright should not be extended to works predominantly or exclusively generated by AI.
- **Consultation:** Firms and businesses within the games industry should consult with their workforce regarding the adoption of new technologies of automation or those otherwise powered by GenAI.
- **Marginalised groups:** Further research is required to discern the impact of GenAI and other new technologies on the representation of marginalised groups within creative work.
- **First Nations cultural protections:** A regulatory framework to protect First Nations cultural and intellectual property should be developed and legislatively protected. Mitigation of the risk of cultural harms, with a particular focus on local Aboriginal and Torres Strait Islander (ATSI) creators, should be a priority.
- **Representation:** Workers' representatives should be included on any consultative committees convened specific to the use of AI. This includes workplace, industry, government and policy consultation.
- **Risks and harms:** The use of AI should be limited or curtailed based on the risk categories established within the EU AI Act (e.g. in the generation of explicit and harmful content).
- **Inquiry:** A parliamentary inquiry into the impact of AI on copyright and intellectual property should be established, with a view to informing legislation like the EU's AI Act.

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Appendix I: Interview questions

Definitions for the purposes of this survey:

Artificial Intelligence (AI): Software tools that become effective by being trained on very large data sets (e.g. ChatGPT, MidJourney, Recommendation Algorithms on YouTube, Amazon, Google, etc).

Automation (non-AI): Software tools that automatically conduct a specific and chosen series of actions (e.g. User created e-mail rules, quantizing music notes, sorting music notes to a scale, audio parameter modulation or automation, Spell-checker, other automatic workflow scripts).

Respondent Categories

Game-Audio-Specific Creators

- Game Composers
- Sound designers
- Voice artists

Non-audio-specific Creators

- Game Studios
- Individual Game Designers (working at Studios)
- Independent Game Developers

Software Developers

- Video game audio software developers (e.g. developers of FMOD, Wwise, etc)
- Video game engine developers (e.g. Unreal Engine, Unity)

Consumers

- Video Game Players

Other (but also tick which of the main 4 categories above you are closest to):_____

Note: Multiple choices will be allowed, however please indicate which you would like to be your Primary Category.

Questions

General (all Categories)

1. What is your role? (in regards to above categories)
2. What is your understanding of the difference between automation and AI?
3. Which video games have provided the most engaging or powerful audio experiences for you, and why?
4. Do you see automation as empowering or disempowering to creators?
5. If different, do you see AI as empowering or disempowering to creators?
6. How much of the creative process do you feel comfortable "handing over" to automation or AI?
7. What emotions do you feel about the potential future of AI, especially when considering your craft, industry, or own profession?
8. Have you found the current climate around AI in creative spaces affecting your motivation for making creative products? If so, please elaborate how.

Game-Audio-Specific Creators

1. What musical projects are you, or have you been involved in professionally over the last 5 years? (3-7 most important in your opinion)

2. What musical projects are you, or have you been involved in personally (not creating for payment by another party) over the last 5 years? (3-7 most important in your opinion)
3. Is there a certain genre of style of music you generally create?
4. What are the key instruments or sound generating tools that you use in this process?
5. How long would it take you (estimated average) to create a track of music (non-adaptive)?
6. How long would it take you (estimated average) to create a track of music (adaptive)?
7. Have you found any forms of automation or AI have made your workflow either more efficient, more effective, or both?

Non-Audio-Specific Creators

1. What types of video games do you tend to create?
2. Do you have a specific person, persons, or contracted party who produces music specifically for your products?
3. Do you have a specific person, persons, or contracted party who produces sound effects specifically for your products?
4. How would you describe the importance, or non-importance of music in your product?
5. How would you describe the importance, or non-importance of sound effects in your product?
6. How would you describe the importance, or non-importance of music being adaptive/reactive based on how the player or audience is interacting with your product?
7. How would you describe the importance, or non-importance of sound effects being adaptive/reactive based on how the player or audience is interacting with your product?

Game Software Developers

1. What types of software do you develop?
2. Who are the general audience(s) for your tools?
3. Do you build non-AI automation into any of the tools you have released?
4. Do you build AI into any of the tools you have released?
5. Do you use any non-AI automation to help with the process of building your tools?
    a. If yes, in what ways does it benefit your process or outcome?
6. Do you use any AI to help with the process of building your tools?
    a. If yes, in what ways does it benefit your process or outcome?

Consumers

1. Do you tend to turn off the music while playing video games? Why?
2. Do you tend to turn off the sound effects while playing video games? Why?
3. Which 3 video games provided the most positive audio experience for you? Why?

4. When playing a video game, do you actively think about the music that is playing?

If Yes

a. Do you actively think about whether the music adapts based on your gameplay? Please elaborate

b. Do you actively think about the melodies of the music being catchy, beautiful, or otherwise creating a positive experience? Please elaborate

c. Do you actively think about the sounds and instruments in the music and the atmosphere they create? Please elaborate

4. When playing a video game, do you actively think about the sound effects that are playing?

If Yes

a. Do you actively think about whether the sound effects adapt based on your gameplay?
b. Do you actively think about any other element of the sound effects?

Appendix II: Participant information sheet

University of South Australia

This project has been approved by the University of South Australia's Human Research Ethics Committee. If you have any ethical concerns about the project or questions about your rights as a participant please contact the Executive Officer of this Committee, Tel: +618 8302 6330; Email: humanethics@unisa.edu.au.

CONTACT AND PROJECT DETAILS	
Researcher's Full Name	Mr John Oestmann and Dr Sam Whiting
Contact Details	John.oestmann@unisa.edu.au, sam.whiting@unisa.edu.au
Project Number	205718
Project Title	*Musical Automation in the Australian Games Industry: A Comparative Study of Adaptive Audio and Generative Music in Game Development*

PARTICIPANT INFORMATION

Introduction

You are invited to participate in an interview discussing your practices, thoughts, and feelings regarding the use of automation and AI in the video game audio industry.

This project is run by the University of South Australia and funded by APRA AMCOS and The Australia Council for the Arts.

What does participation involve?

Participation will involve an interview in 2 parts, run through the online video call platform Riverside. The interview will be recorded for later analysis of answers.

The first part of the interview will follow pre-set questions based on which category you professionally identify with. You will be provided with these questions prior to the interview to help you decide which category to place yourself in.

What are the possible benefits of taking part?

While there are no immediate or direct benefits to taking part in this project, the results (along with the results of interviews with others) will be synthesised and analysed, and a final report published sharing our analysis and discussion.
This research will contribute to the public understanding of how Automation and AI are affecting the video game audio industry and the professionals inside.

What are the possible risks of taking part?

As no personally identifiable information will be shared in the final public report, there is no expectation of professional or personal risk. If you do find the interview to cause distress, you may choose to end the interview at any point. If you choose to do so, you may also choose that the partial interview is not included in the study.

Your Rights as a participant:
Participation is voluntary: Your involvement in this project is entirely up to you. You have:
• The right to withdraw from participation at any time.
• The right to request that any recording cease.
• The right to have any questions answered at any time.
• The right to have any unprocessed data withdrawn and destroyed, provided it can be reliably identified,
and provided that so doing does not increase the risk for the participant.

Will the information I provide remain private?
All records containing personal information will remain confidential and no information which could lead to identification of any individual will be released unless required by law. However, the researcher cannot guarantee the confidentiality or anonymity of material transferred by email or the internet.

How long will this data be stored?
The interviews and associated data will be stored on a password protected and secure UniSA Server and backed up on an external hard drive in a locked office. This data will be kept for 5 years in line with the UniSA guidelines. This data will not be labelled with your name or other personal information, but using a ID pertaining to your survey category and interview number.

Further information and who to contact:
The person you may need to contact will depend on the nature of your query. If you would like to receive a summary of the research findings, please contact the researcher [John Oestmann or Dr Sam Whiting]. If you want any further information concerning this project or if you have any problems which may be related to your involvement in the project, you can contact the researchers.

John Oestmann
John.oestmann@unisa.edu.au

Dr Sam Whiting
0422746340
sam.whiting@unisa.edu.au

If you have any complains about the project or how it is being run, you can contact the Reviewing HREC approving this research:
University of South Australia Human Research Ethics Committee
humanethics@unisa.edu.au

Appendix III: Consent form

University of South Australia | Research and Innovation Services

Human Research Ethics Committee
Consent Form

This project has been approved by the University of South Australia's Human Research Ethics Committee. If you have any ethical concerns about the project or questions about your rights as a participant please contact the Executive Officer of this Committee, Tel: +618 8302 6330; Email: humanethics@unisa.edu.au.

CONTACT AND PROJECT DETAILS	
Researcher's Full Name	Mr John Oestmann and Dr Sam Whiting
Contact Details	John.oestmann@unisa.edu.au, sam.whiting@unisa.edu.au
Project Number	205718
Project Title	*Musical Automation in the Australian Games Industry: A Comparative Study of Adaptive Audio and Generative Music in Game Development*

PARTICIPANT CERTIFICATION

In signing this form, I confirm that:

- I have read the Participant Information Sheet, and the nature and the purpose of the research project has been explained to me. I understand and agree to take part.
- I understand the nature of my involvement in the project.
- I understand that I may not directly benefit from taking part in the project.
- I understand that I can withdraw from the project at any stage and that this will not affect my status now or in the future.
- I confirm that I am over 18 years of age.
- I understand that the audio and video of our conversation will be recorded for this project.
- I understand that while information gained during the project may be published, I will not be identified and my recording will be labelled using a code number based on professional category and interview number.
- I understand that the recordings will be stored securely on the University server throughout the project. During data collection copies of working files will be temporarily stored on the Riverside platform, be stored on the researcher's password protected UniSA account and backed up onto an external hard drive kept in a locked office. This data will be stored securely on the UniSA Server for 5 years in line with the UniSA guidelines.

Participant's Signature	*Printed Name*	*Date*

SECTION 3: RESEARCHER CERTIFICATION

I have explained the study to the participant and consider that he/she understand what is involved.

Researcher Signature	*Printed Name*	*Date*

Creative People, Products and Places (CP3) is an internationally recognised interdisciplinary research centre based at the University of South Australia.

Director Professor: Susan Luckman
Associate Directors: Professor Justin O'Connor, Dr. Saige Walton and Dr. Stuart Richards

CP3 undertakes high quality humanities and creative practice research into culture and creativity. CP3 is concerned with the creative ecosystem of art, media, writing and culture, including its communities, economies, publics, institutions, festivals and values. CP3 focuses on the people who make and participate in art, media and culture, on how creative outputs are made and valued, and on the cultural spaces and communities in which this creative ecosystem takes place.

This Working Paper Series is intended to help engagement with the different interests and communities in the local creative ecosystem, providing research and ideas in an accessible way, drawn from CP3 researchers and collaborators from Australia and overseas.

For more information please contact us at **CP3@unisa.edu.au**

https://www.unisa.edu.au/research/creative-people-products-places/

ISBN 978-1-922016-92-8 Electronic Version

DOI: 10.25439/rmt.27289779

Published by the Creative People, Products and Places Research Centre (CP3), University of South Australia, Adelaide

Designed by Studio TunTun

University of South Australia | Creative People, Products and Places (CP3)


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