IVE: Australian Research Centre for Interactive and Virtual Environments

Positively influence the world through changing people's realities

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Who is IVE?

IVE is a leader in AR/VR Research

University of South Australia has published more research papers in AR than any university or research organisation.

Prof Billinghurst is ranked #1 for published Augmented Reality papers.

Prof Thomas is ranked #4 for published Augmented Reality papers.

Scopus rankings for AR (Top 160 People)

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IVE Leadership Team

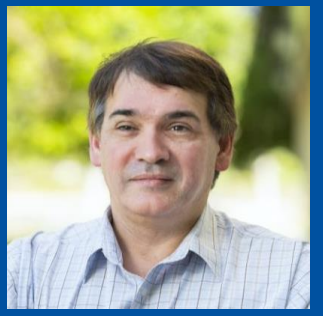
Professor Bruce Thomas Director

Professor Mark Billinghurst Deputy-Director

Professor Ning Gu Deputy-Director

Professor Ian Gwilt

Professor Simon Biggs



Professor Javaan Singh Chahl

A/Professor Ross Smith

Dr. Peter Schumacher

Dr. Joanne Zucco

Dr. Gun Lee

6 Professors
14 Academics
10 Research fellows
6 Professional Staff
30 PhD students
2 Masters students
4 Adjunct faculty

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Capabilities & Technologies

Human Computing Interaction

Explores and develops solutions that address the interaction between humans and computer

Empathic Computing

Develops computer systems that recognizes and shares emotions and help people better understand one another

Wearable Computing

Explores wearable computers, augmented reality and virtual reality, embedding of electronic devices into textiles and clothing

Industrial Design

Investigates the form and function of products people use every day considering elements such as aesthetics, function, usability and social significance

Sensor Systems

Encompasses sensors as devices and algorithms, as well as technologies required in sensing applications, including remote sensing, surveillance systems, dedicated sensor platforms and networks

Digital Transformations

Explores how culture is transformed by information and communication technologies and their implications for our future

Creative Computing Studio

Investigates what it is to be human in a technologized world and to what extent we are already technologically hybridized.

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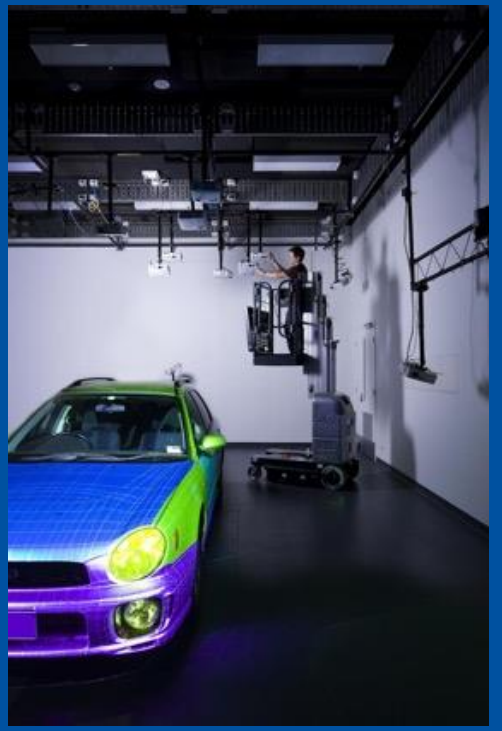
Facilities

A suite of mixed reality visualisation environments enabling up to full scale simulation



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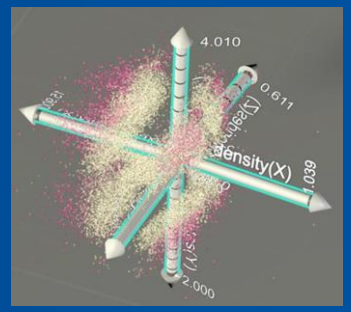
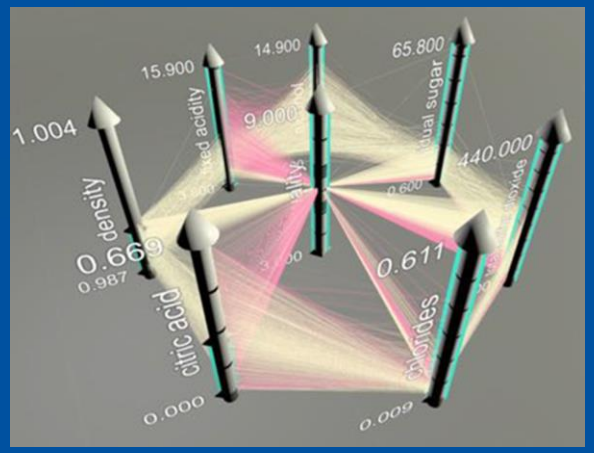
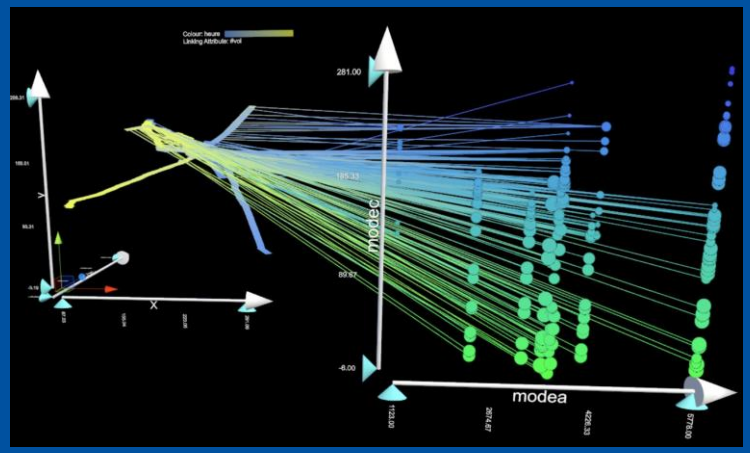
Immersive Analytics

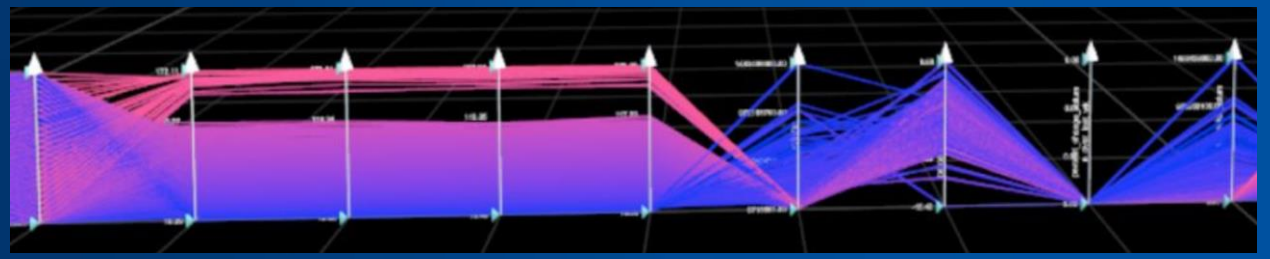
Intuitively exploring complex data relationships through immersive visualization techniques

- Directly touch and manipulate data to gain understanding
- Combine complex data sources
- Dynamically manipulate data axes
- Combine axes to create complex visualisations
- Visualisations expose the relationships between the data
- Exceed the limits of a desktop monitor to see all the data in-situ









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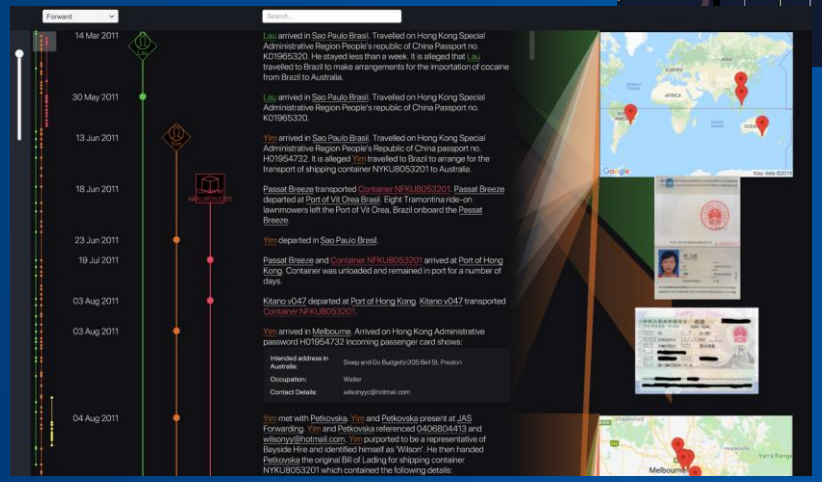
Narrative Visualisation

Exposing the narratives within a story embedded inside complex data sources

- Rapidly identify the narratives within the data
- Combine known facts with implicit knowledge to expose the relationships between the actors
- Visually manipulate the actors within the data to explore the narratives within the story
- Present data as a narrative supporting the development of mental models



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Health and Medical

Augmenting health and enhancing medical procedures through applying mixed reality technologies

AR to help with Post Traumatic Stress

Cognitive Psychology and Neuroscience Inspired AR

VR Active Rehab Physiotherapy

Enhancing medical devices with AR

Investigating Motion Sickness desensitization with VR

VR Exercise

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Empathic Collaboration

Using AR/VR/MR technology to develop systems that support real-time understanding

Sharing empathy in VR with physiological sensors

Adaptive Avatar Multi-scale AR-VR Remote Collaboration and Shared Experience

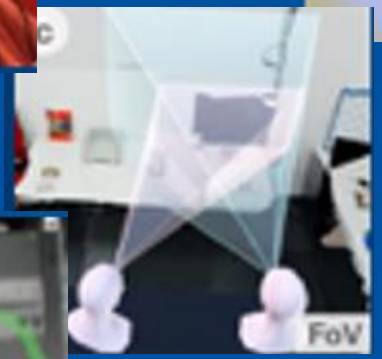
360 MR Teleconferencing

AR First-Person View Video Instructions

EEG Hyper-scanning for MR Collaboration

Empathy Glasses

Adaptive Avatar



AR-VR Shared Experience

360° MR Teleconference

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Architecture and Built Environment

Applying computational visualization to support contemporary design, building and planning studies

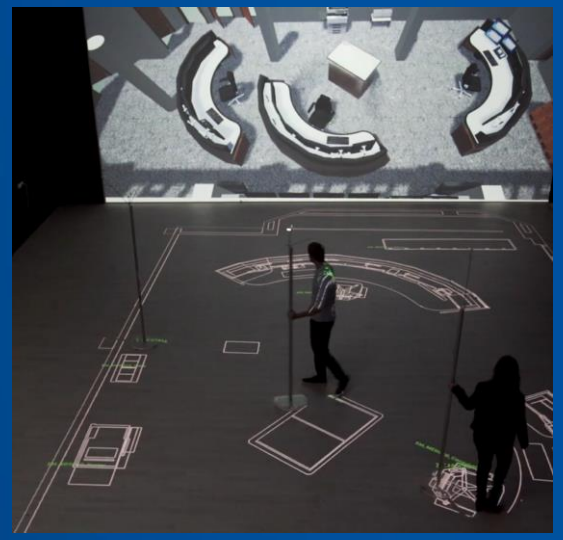
Building Information Modelling (BIM) and City Information Modelling (CIM)

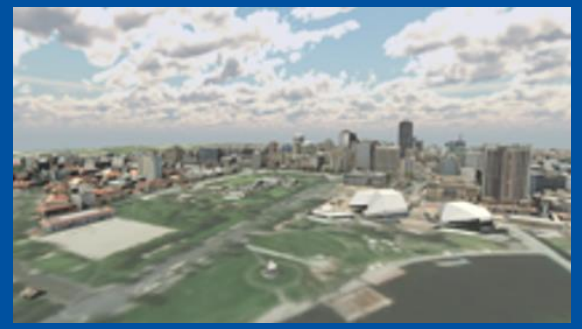
Computational design analysis

Simulation, urban analytics and smart cities

Digital humanities and heritage

Design collaboration and behavioral studies





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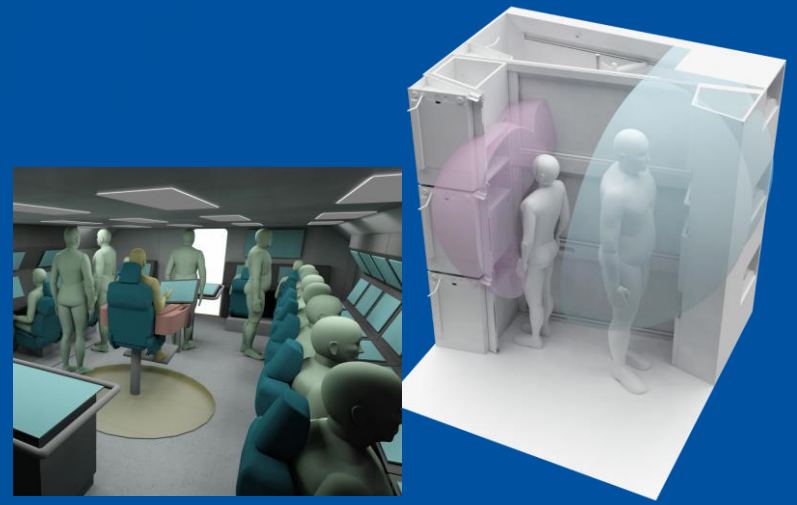
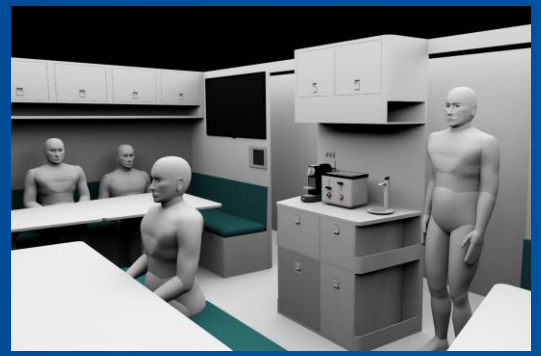
Complex Space Design

Applying human centered design approaches to the industrial design of habitable spaces



Submarine Design

- Command Desks
- Sleeping Quarters
- Food Preparation



Command and Control Rooms

Hospital Operating Theatre

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Creative Computing Studio

Interactive Performance Environments

Exploring artistic expression with interactive systems and machine learning

Developing novel interfaces for experiencing audio-visual information

Focus on human-machine co-creation and improvisation

Collaborating with artists (musicians, dancers, writers) and scientists (computing, neuroscience, anthropology)

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International Collaborations

Academia

KAIST

東京大学 THE UNIVERSITY OF TOKYO

Université de Montréal

TU Graz

ETRI

Keio University 1858 CALAMVS GLADIO FORTIOR

THE UNIVERSITY OF AUCKLAND NEW ZEALAND

IMT Atlantique Bretagne-Pays de la Loire École Mines-Télécom

TUM

Nara Institute of Science and Technology NAIST

UC UNIVERSITY OF CANTERBURY Te Whare Wānanga o Waitaha CHRISTCHURCH NEW ZEALAND

北京理工大学 BEIJING INSTITUTE OF TECHNOLOGY 1940

Industry

oculus

Google

SIEMENS

LOCKHEED MARTIN

Microsoft

amazon

htc

SAAB

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Our Researchers

University of South Australia

Australian Research Centre for Interactive and Virtual Environments

Professor Bruce Thomas

Professor Thomas is nationally and internationally recognised for his contributions to the scientific community and to the industry in the areas Wearable Computers, Tabletop Interactions, Augmented Reality, and User Interaction. His experience includes working at the School of Information Technology and Mathematical Sciences, the University of South Australia since 1990. He has run his own computer consultancy company. He was a Computer Scientist at the National Institute of Standards and Technology (A major US government laboratory for the Department of Commerce.) and a software engineer for the Computer Sciences Corporation and the General Electric Company.

Professor Mark Billinghurst

Mark Billinghurst is Professor of Human Computer Interaction at the University of South Australia in Adelaide, Australia. He earned a PhD in 2002 from the University of Washington and researches innovative computer interfaces that explore how virtual and real worlds can be merged, publishing over 300 papers in topics such as wearable computing, Augmented Reality and mobile interfaces.

Professor Ning Gu

Ning Gu is Professor of Architecture in the School of Art, Architecture and Design at the University of South Australia. He has researched in the broad areas of Architectural Computing and Design Cognition, including topics such as Computational Design Analysis; Generative and Parametric Design Systems; Computer-supported Collaborative Design; Virtual Environments; Building Information Modelling; Intercultural Design and Communication; and Protocol Studies on designers' behaviour and cognition.

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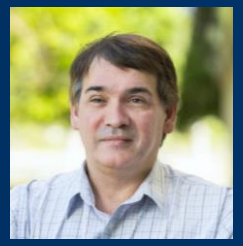
Professor Ian Gwilt

Academic/Researcher Designer/Digital Artist

Spheres of interest: design research, visual communication design in interdisciplinary projects, information/data design, design in healthcare, co-design, mixed and augmented reality in creative practice and creative applications of 3D printing.

Professor Simon Biggs

Simon Biggs is a new media artist, writer and curator with interests in digital poetics, interactive, auto-generative and affective systems, interdisciplinary research and co-creation across the creative arts, humanities and physical sciences. His work has been widely presented, including at the Tate (Britain, Modern and Liverpool), Institute of Contemporary Arts (London), Centre for Contemporary Art (Glasgow), Kettles Yard Cambridge), Pompidou (Paris), Academy de Kunste (Berlin), Kulturforum (Berlin), Rijksmuseum (Twenthe), Maxxi (Rome), Macau Arts Museum, San Francisco Cameraworks, Walker Art Center (Minneapolis) and the Art Gallery of New South Wales (Sydney). He has been keynote at many conferences and lectured internationally. Publications include Remediating the Social (2012), Autopoeisis (with James Leach, 2004), Great Wall of China (1999), Halo (1998), Magnet (1997) and Book of Shadows (1996).



Professor Javaan Singh Chahl

Javaan Chahl is DST Group Joint Chair of Sensor Systems and has been with UniSA since 2012. Prior to this, he served as the Professor of Aerospace (Unmanned Aerial Vehicles) at RMIT University in Melbourne. Prior to this role, he was at the Defence Science and Technology (DST) Group, with whom he still works closely. Professor Chahl earned his Ph.D. in Neuroscience & Robotics at the Australian National University. His research provides ample evidence of his breadth of research expertise including Avionics for UAVs, operations analysis, flight trials, space exploration, neuroscience, anatomy, manufacturing technology and behavioural biology.

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A/Professor Ross Smith

Ross Smith leads efforts in translating immersive technologies such as Augmented, Virtual, and Mixed reality technologies into health applications. He possesses a strong track record and wealth of experience in demonstrating the advantages of applying interdisciplinary collaborations in the areas of technology, health sciences, design, psychology and journalism to solve industry challenges through novel technology developments. Possessing an industry focus Ross brings value through his highly developed technical capability and excellent communication skills.

Dr. Peter Schumacher

Peter Schumacher is the Program Director of the Industrial Design programs at the University of South Australia. He has worked as a designer in Australia and internationally and has extensive experience in teaching the communication and interaction elements of industrial design. His PhD from the Australian National University was on the design of pictorial assembly instructions for use in developing countries and on methods of researching and codifying knowledge for human-technology interaction design.

Dr. Gun Lee

Gun Lee is a Senior Research Fellow at the University of South Australia (UniSA) investigating interaction and visualization methods for sharing virtual experiences in Augmented Reality (AR), Mixed Reality (MR), and immersive 3D environments. Recently, using AR and wearable interfaces to improve remote collaborative experience has been one of his main research themes. Extending this research into sharing richer communication cues and scaling up to a larger group of participants are the next steps he is working on.

Dr. Joanne Zucco

Jo Zucco is a lecturer in the School of Information Technology and Mathematical Sciences at the University of South Australia, whose area of interest is understanding how the affordances of Augmented Reality (AR) technology can be used to support and improve human abilities, health and well-being. Jo is interested in wearable human-computer interaction; specifically, the need to better understand user interaction with head-worn displays.

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Thank You

Headquarters
Australian Research Centre for Interactive and Virtual Environments
UniSA Mawson Lakes Campus
Mawson Lakes, South Australia 5095 Australia
IVECentre@unisa.edu.au

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