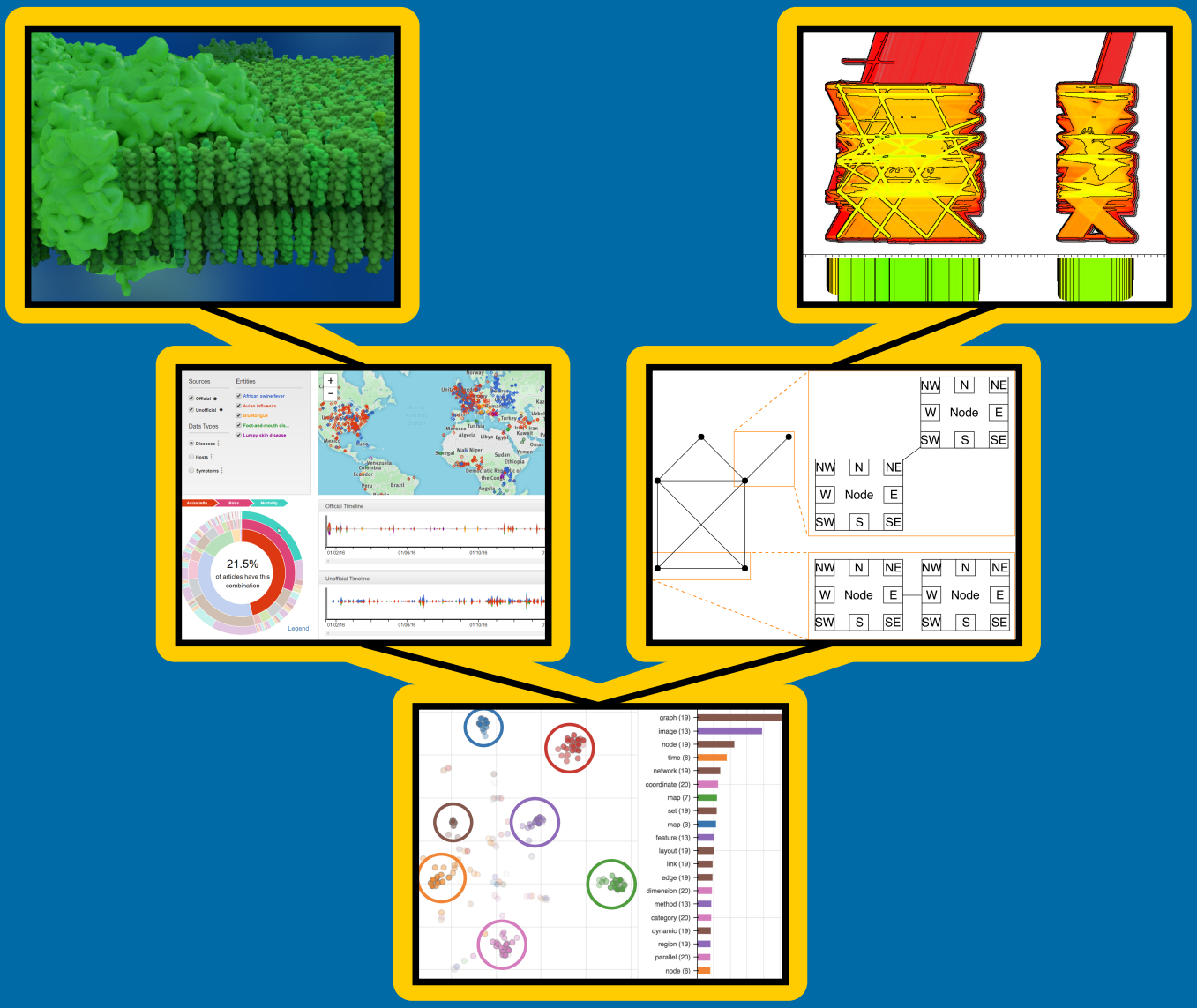
# VINCI 2018

## The 11th International Symposium on Visual Information Communication and Interaction

Växjö, Sweden
August 13–15, 2018




Edited by Karsten Klein, Yi-Na Li and Andreas Kerren

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General Chair: Andreas Kerren

Program Chairs: Karsten Klein
Yi-Na Li

Sponsor: Linnaeus University


**The Association for Computing Machinery**
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# Preface

Welcome to the **11th International Symposium on Visual Information Communication and Interaction (VINCI 2018)** held in Växjö, Sweden from August 13th to 15th, 2018. The objective of this symposium series is to provide a forum for researchers, artists, designers and industrial practitioners to discuss the state of the art in visual communication theories, designs and applications. As in past years, the papers in these proceedings represent the most interesting and exciting recent research in the area of visual communication.

The conference this year received 34 submissions in total (i.e., 26 full paper, 3 short paper and 5 poster submissions) from the international research community, each of which was carefully reviewed by at least 3 Program Committee members. Based on these reviews, we accepted 11 full papers finally (42.3% acceptance rate). In addition, because of the high quality of submissions, we selected 3 from the full/short paper submissions to be presented as short papers. We also accepted 9 submissions as posters from the poster and remaining paper submissions. The 11 full papers, 3 short papers and 9 posters presented here cover a broad range of visual communication topics, ranging from visualization, to designs, theories and applications.

Moreover, we are proud to have two fascinating plenary keynote talks included into the program, given by internationally distinguished researchers: Min Chen (University of Oxford, UK) and Jon McCormack (Monash University, Australia). They contribute with their expertise and experience to provide a deeper understanding of the conference scope and topics.

We thank the authors of all submissions, whose work and dedication made it possible to put together an exciting program of high technical quality. In particular, we would like to express our gratitude to the invited speakers for their invaluable contribution and sharing their vision in their keynote talks. Next, we would also deeply appreciate the International Program Committee members (including our auxiliary reviewers) for their responsive reviews of the submitted papers and posters. We are also grateful to all organizing committee members: the symposium and these proceedings would not have been possible without their assistance. Finally, we thank our conference sponsors for generously supporting the conference.

**Andreas Kerren**
*General Chair*

**Karsten Klein and Yi-Na Li**
*Program Chairs*

August 2018

# Conference Organization

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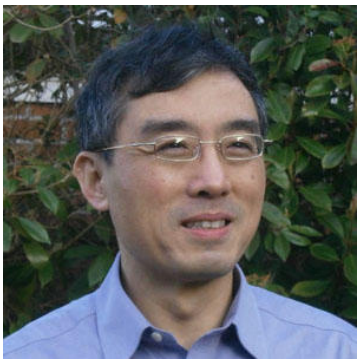
# Keynote Speakers

## Min Chen

**Title:** Is Visualization Underpinned by Communication Theory?



**Abstract**

Seven decades ago, Claude Shannon's landmark article "A Mathematical Theory of Communication" (1948) laid down the foundation of modern tele- and data communication, giving rise to information theory as an academic subject. In this talk, the speaker will describe the applications of information theory to visualization and demonstrate how information theory can explain numerous phenomena in visualization. In particular, the speaker will discuss an information-theoretic metric for analysing the cost-benefit of data intelligence workflows, elaborating the values of visualization in such workflows. The speaker will also outline conjectures that the metric may potentially have implications beyond data science.

**Biography**

Min Chen developed his academic career in Wales between 1984 and 2011. He is currently the professor of scientific visualization at Oxford University and a fellow of Pembroke College. His research interests include visualization, computer graphics, human-computer interaction, and aspects of computer vision. He has co-authored some 200 publications, including his recent contributions in areas such as theory of visualization, video visualization, visual analytics, and perception and cognition in visualization. He has worked on a broad spectrum of interdisciplinary research topics, ranging from the sciences to sports, and from digital humanities to cybersecurity. His services to the research community include papers co-chair of IEEE Visualization 2007 and 2008, Eurographics 2011, IEEE VAST 2014 and 2015; co-chair of Volume Graphics 1999 and 2006, EuroVis 2014; associate editor-in-chief of IEEE Transactions on Visualization and Computer Graphics; and co-director of Wales Research Institute of Visual Computing. He is currently an editor-in-chief of Computer Graphics Forum. He is a fellow of British Computer Society, European Computer Graphics Association, and Learned Society of Wales.

# Jon McCormack

**Title:** Design after Nature

**Abstract**
Nature has driven us in what and how we create for millennia. Biomimetic approaches to human design are inspired by natural forms, shapes and processes. In computing, nature-inspired algorithms mimic collective behaviour or biological evolution to solve hard problems in search, optimisation and learning. In this talk I'll show how I have developed a creative visual design practice informed by processes from biological development, the architecture of natural form, and evolutionary processes. My work began by devising advanced visual models of morphogenetic development in plants. Incorporating evolutionary processes allowed designs to emerge that would be difficult or impossible to discover independently, making them "beyond human design". In later work, I have experimented with evolutionary ecosystems and processes such as niche construction to encourage diversity in the visual style of works generated by algorithmic processes. My most recent work looks at translating from the virtual back to the real, using digital fabrication technologies driven by generative computational processes. The goal is to build dynamic, responsive, intelligent physical systems that interact directly with living organisms, symbiotically affecting their growth and development. This leads to the creation of bio-machine hybrids—bringing the biomimetic concept full circle—and heralding a new form of co-design where human, machine and nature all contribute to the design process.

**Biography**
Jon McCormack is an Australian-based artist and researcher in computing. He holds an Honours degree in Applied Mathematics and Computer Science from Monash University, a Graduate Diploma of Art (Film and Television) from Swinburne University and a PhD in Computer Science from Monash University. He is currently full Professor of Computer Science and director of sensiLab at Monash University in Melbourne, Australia. His research interests include generative art, design and music, evolutionary systems, computer creativity, visualisation, virtual reality, interaction design, physical computing, machine learning, L-systems and developmental models. Since the late 1980s McCormack has worked with computer code as a medium for creative expression. Inspired by the complexity and wonder of a diminishing natural world, his work is concerned with electronic "after natures"—alternate forms of artificial life that may one day replace the biological nature lost through human progress and development.
His artworks have been widely exhibited at leading galleries, museums and symposia, including the Museum of Modern Art (New York, USA), Tate Gallery (Liverpool, UK), ACM SIGGRAPH (USA), Prix Ars Electronica (Austria) and the Australian Centre for the Moving Image (Australia). He is the recipient of over 16 awards for new media art and computing research including prizes at Ars Electronica (Austria), Images du Futur (Canada), New Voices, New Visions (USA), Alias/Wavefront (USA), The John Lansdown Award for Interactive Media (Europe/UK), Nagoya Biennial (Japan), the 2012 Eureka Prize for Innovation in Computer Science and the 2016 Lumen Prize for digital art

(still images). The monograph, Impossible Nature: the art of Jon McCormack, was published by the Australian Centre for the Moving Image in 2005 documenting his creative achievements over the previous 15 years.

McCormack was an ARC Australian Research Fellow from 2010–2015, and has held visiting research positions at the University of Sussex, Goldsmiths (University of London) and the Ars Electronica Future Lab. The book Computers and Creativity (co-edited with Mark d'Inverno) was published in 2012 and described many new approaches to research in computational creativity.

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