

# CREATIVE MACHINE

## Selected Abstracts

**ROBERT PEPPEREL**

### **The Birth of Intelligent Images**

Images have traditionally been regarded as inert objects without awareness of themselves or those who look at them. But recent technological developments suggest that images are evolving into dynamic systems with the potential to acquire intelligence, memory, creativity, and even sentience. Informed by recent research into the computational modelling of human vision, I consider the prospects for the emergence of intelligent images.

**MICK GRIERSON**

### **Ethical Dimensions of Machine Learning in the Creative Industries**

To most observers, contemporary AI is as opaque as it is powerful, and this in itself is the root of a number of significant problems. For example, it is still the case that many people, including prominent academics, conflate progress in AI and Machine Learning with the creation of artificial conscious beings that have intention, accountability and even deserve legal rights. However, to many others, it appears that no such technology exists, and many experts in the field predict that even if such a thing were possible, it could not happen using computational technology of the kinds we currently have. In this talk I will argue that whatever the truth of this, the idea of an AI that can be considered responsible for its actions is masking significant ethical dilemmas impacting society, including that although modern AI and ML systems have considerable power, this power comes from its capability to represent human experience. I will also present a selection of projects by staff and students working in and around the Creative Computing Institute to illustrate how human-centred AI and ML approaches present challenges and solutions in this context.

## **YASMIN MORGAN**

### **Curating AI Panel Discussion**

Curating the digital is not just about putting the work in the space, but exploring the tensions of the underlying technology to the public. AI and VR Art often means the audience is no longer just an observer, but interacts and thinks through the works.

- What are the challenges of presenting these mediums to a broad audience?

I'm interested in some of the innovative forms of digital galleries you have curated and set up. I feel that curating VR and XR art is about defining the experience of space:

- The potential of virtual environments/3D world for experiencing an exhibition - what are the benefits and the drawbacks?

Experiencing AR Art happens largely through the phone today - a world within a screen, is it a barrier or an intimate interface?

- The potential of site-specific installations of AR Art, making works fit within architecture, like a cityscape or a gallery space. Where do you see this experience evolving into?
- How has the rise of NFTs changed the way you think about curating and producing exhibitions?

## **GABRIEL BROSTOW**

### **LookOut! Two Cases of Digital Assistance for Artists**

Casual users of AI are often seen as recipients of new technologies. But what happens when the recipient is trying to be creative, adapting and even changing their mind in the middle of a project? This talk focuses on two case studies where leading computer vision research was developed in concert with the interfaces that would make the technology useful. The first, led by Mohamed Sayed, is a digital assistant that helps a solo film-maker to follow and frame their actors on-set and in the wild. The second, led by Gizem Unlu, helps sketch artists of any skill level to draw and pose the limbs of 3D human mannequins.

## **ANTONIA HAMILTON**

### **Brains in Theatre and Theatre in Brains**

How can research in neuroscience understand the unique experience of performing a play? This talk will describe recent studies at the intersection of theatre, neuroscience and engineering where we use wearable technologies to track behaviour and brain activity on stage. We can use motion sensors to track how autistic children engage with actors in an interactive performance, and can use fNIRS brain imaging to capture how the act of taking on a new role in the theatre changes brain activity patterns linked to the sense of self. These results open the way to new studies of the intersection of performance and neuroscience.

## **IFI MAVRIDOU**

### **Emotion sensing, smart wearables & the future in creating XR experiences**

Immersive experiences drive emotion (or affect), and emotion drives behaviour. Through many years of research, today we witness the development of wearable biometric solutions with multi-modal sensing capabilities. We are able to apply intelligence in computing systems to detect, interpret and respond to the user's state, in XR but also in the real world. Smart sensing systems, powered by artificial intelligence and machine learning, can provide useful insights on the player's state, performance, provide actionable feedback to the user, and even medical assessment. Our team at Emteq Labs, developed affect-aware systems for XR, with selected examples of use in projects and case-studies in training, research, healthcare, and entertainment to be presented in this talk.

## **FAHIM KAWSAR**

### **Can Earables Revolutionise Continuous Vital Sign Monitoring?**

Abstract: Do you know that someone has a heart attack by the time you finish reading this abstract? Indeed, every 40 seconds, a heart attack occurs, and a heart attack fatality occurs about every minute. For long, medical science has established that frequent monitoring of heart rate and blood pressure is the key to mitigating significant risks for stroke, heart failure and coronary artery disease. Current gold-standard vital sign monitoring devices are invasive, cause discomfort and interfere with users' activities. We challenge this status quo and ask - can your next earable be the secret weapon to manage your cardiovascular health? We aren't talking PopSci here but the remarkable capabilities of a sensory earable ushering a new pathway to a healthy heart. However, ensuring the accuracy and robustness of in-ear vital sign measurements is the most complex challenge in this vision. This talk will reflect on the algorithms and their systematic characterisations to address this challenge in continuously measuring the five most critical vital signs in our ear - Heart Rate (and Heart Rate Variability), SPO2, Respiration Rate, Temperature and Blood Pressure. Finally, I will demonstrate how cardiac-aware music instrumentation with earables can dramatically enhance our abilities to maintain a healthy heart.

## **RUARI GLYNN**

### **Lively Artefacts: Experiments in Interactive Architecture**

We've been witnessing rapid progress in robotics promising driverless cars, autonomous aerial vehicles, and seemingly endless other forms of intelligent kinetics to soon co-habit our built environment. The talk will look at how these technologies are expanding design and architecture's aesthetics to increasingly encompass concerns of behaviour. In particular an uncanny sense of life, or animacy, found—often accidentally—in the objects and spaces we design to have their own agency. It will be illustrated by my art installation projects, commercial architectural projects and the research of Bartlett's Interactive Architecture Lab.

**SZU HUNG LEE**

**Creativities in AI: from technology to product and business**

Talk about the journey of Emotech from 2015, from a robot to multilingual AI avatar solutions, to illustrate that creativity is not only about technology innovation, but also about product design and commercialisation. As one of the first tech startups in multimodal AI, Emotech has experienced the good time and bad time of AI, the innovations in Emotech have made impacts beyond academia, and extended globally. Especially now to work on the world's first AI ambassador for the middle east, Emotech trying to overcome the barriers of languages and cultures.

**PIOTR MIROWSKI**

**Improvised theatre and comedy with chatbots, robots and avatars**

Theatre and AI can be a mutually beneficial relationship, which I investigate using the case study of Improbatics: a science-theatre show where human actors operate and perform alongside AI-powered chatbots, robots and avatars. Because of the spontaneous and live artist interaction with AI, we call that setup "artist-in-the-loop". The development and performance of the show represent the creative loop encompassing both artist and machine.

The artists-in-the-loop performing in Improbatics curate content generated by the chatbot and anthropomorphise their robotic stage partners for imagined storytelling. Actors are driven by the high stakes of a live performance for diverse audiences and take responsibility for their AI stage partner. This live human-machine interaction, where content is generated, curated, and performed in the same moment, is more tightly coupled than typical interactions that involve AI systems used for dialogue.

I will describe several ways that artistic co-creation with AI-powered systems supports scientific research on storytelling, and cover our most recent work on tele-immersive improvisation using custom augmented reality tools and avatars. With Improbatics as our case study, I argue that the collaborative practice of live theatre augmented by AI is an ideal testbed for scientific research on human-machine interactions.

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