**AI and the AI Art School/Harmonising the Arts with Technology**

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TRANSCRIPT

0:00Thank you so much to the CHEAD conference committee and for MMU to for inviting and hosting me. It’s a pleasure to return to Manchester. My journey actually began here as an audiovisual technician at the University of Salford back in 2000 during what was then the analogue to digital transition.

0:18 These formative years really shaped my academic interests and practice-based research approaches. I had a non-traditional pathway to become a professor at a now a Russell group university, completing my PhD starting at Salford part-time while still working full-time as a technician and starting a family.

0:37 Before working at King’s, I was a Deputy Head of School of Art, Design and Media, overseeing digital transformation initiatives and since then, I’ve been both a Head of the department and Vice Dean at King’s College London. So I bring a multi-faceted vantage point to this discussion.

0:52 I’ve always situated my research on periods of change and transition. The moment that new technology emerges, specifically where art intersects with technology, which leads me to the central theme of this talk: AI and the Art School, Harmonising the Arts with Technology.

1:10 And standing before you, the very people who have been harmonising arts and technology throughout your careers, is both humbling and inspiring. As Stephen Hawking said of artificial intelligence in 2016, it’s either the best or the worst thing ever to happen to humanity.

1:26 As you all know AI has been advancing at an incredible and overwhelming pace since chat GPT was released in 2022. We’re experiencing a perfect storm of three ingredients: sophisticated AI algorithms that can process, learn and behave intelligently, access to vast resources of data that are generated and captured and masses and masses of processing power. This quote exemplifies the polarisation and oppositional attitudes with which AI is received and articulated. Positioned as either an existential threat or something to be evangelised and celebrated.

2:00 We see this playing out in our own domains of the arts where copyright has become a battleground between creatives and corporations. On one side AI will both revolutionise and democratise artistic creativity, but on the other, it threatens human creativity and livelihoods in the creative sectors.

2:20 Another polarisation. On the one hand the UK Creative Industries are celebrated, named as one of the nine growth-driving sectors underpinned by significant government investment, but on the other, as we know, arts and humanities education faces cut upon cut.

2:38 I can’t think of a more challenging time to be a leader in arts education. But my job is not to dwell in this negative space but to inspire and energise you and I really want to focus on ways you can lead and protect creativity, curiosity, agency, consciousness, awe and wonder.

2:56 These are the key distinctions between human and machine learning and they are valuable assets in the inevitable AI economy and the ways in which you can build resilience and opportunity to dynamically respond to this shifting landscape.

3:09 First, I want to step back into my own journey. My PhD which I began in the early 00s on interactive storytelling was influenced by women visionaries and innovators including as many of you will recognise, Lynn Hershman Leeson, Tony Dove, Char Davies and Laurie Anderson.

3:30 All were making ground-breaking, immersive, interactive artworks at the cutting-edges and as a student at that time I didn't really perceive a shortage of women representation in these sectors. This leads me to my most recent research project funded by an AHRC fellowship which had leadership development in creative technologies as a core consideration.

3:50 The question of what leadership looks like in emerging technological spaces is critical in this changing landscape. According to Google images it looks like this. But as we know these aren't necessarily the lived realities. So with my collaborator, Vicki Callahan, we examined moments of innovation during the emergence of new media forms.

4:10 Over 6 years we interviewed 140 women, trans and non-binary individuals working in transmedia, virtual reality and immersive technologies. It included some of those individuals I looked at in my PhD studies, including Dove, Hersman, Lees and Davies. People who had initially inspired me and who I had held in very high regard.

4:30 As the interview progressed, my frustration increased as we unearthed the rich contributions to technology that were unknown, sidelined and ignored. There was a total lack of recognition for what these individuals had achieved. 4:45 They’d been written out of history or overwritten by narratives of discovery and investment. This pattern is set to continue to repeat unfortunately as we see what has been happening recently. It is highly likely to become ever more pronounced and challenging.

5:01 This diagram shows the cyclical erasure of women's contributions or gender diverse contributions, which can be charted right back to cinema’s birth. It tells an undeniably gendered story. Technological innovation begins with content experimentation, but when the technology itself is commercialised the early innovators are pushed out as the story of discovery is told.

5:23 And that which is commercialised, not that created is written into history and in many cases the technology then becomes subsequently gendered. Here are some key examples. In the 1910s and 20s, women made significant contributions to early film editing. They dominated the workforce bringing skills from industrial scale machine sewing.

5:46 Margaret Booth, the first to be given the title of Film Editor and Dede Allen, dubbed the Film Editing Doctor, established conventional narrative techniques in Hollywood. And in Soviet cinema, Esfir Shub and Elizaveta Svilova, pioneered experimental forms.

6:01 Schubb invented the compilation documentary, whilst Svivola developed rapid montage which was often then attributed to her husband, Dziga Vertov. And then editing latterly becomes framed as a male profession. In the 1930s and 40s at Disney women animators made key contributions to classics like Fantasia, Dumbo and Bambi.

6:22 Walt Disney's war-time recruitment of women enabled their participation yet their work was latterly overshadowed by accounts glorifying Disney’s nine old men. In the 1940s and 60s, six women were central to developing the first ever programmable, electronic, general purpose digital computer. This history has gained wider recognition through the 2016 film, Hidden Figures, highlighting NASA’s super computers.

6:48 Pioneers like Grace Hopper, Jean Sammet and Fran Allen, created early programming languages and the numbers of women encoding actually then dropped off to near absent levels in the 1980s with the commercialisation of the home computer targeted at boys which meant that they were more likely than girls to be exposed to computing technologies.

7:09 In the 1970s and 80s women's contributions to electronic music have only recently come to light through the 2020 documentary Sisters with Transistors. These innovators shaped the field, but their stories were lost as electronic music became mainstream, again commercialised and dominated the male DJ figure. In the 1980s as consumer virtual reality first emerged, Char Davis led, in immersive sensory art, but at the same time Nintendo's Virtual Boy console and its high-profile marketing campaign portrayed VR as a technology for boys.

7:49 Common to all of this is we often hear these stories about their contributions after the fact, through the retrospective work often years later by academics and documentarians. We really need to recognise these innovations sooner to provide the role models and representations so critically and now desperately needed now more than ever. I want to dig a bit deeper into one of the interviews included in the book.

8:14 Char Davies whom I initially admired for her work in digital arts actually revealed an alternate version of her story during our interview. During that first commercial wave of virtual reality in the nineteen nineties, Davies created the first ever immersive artwork for a VR stereoscopic head-mounted display. This was in 1995, with a piece entitled Osmose. It used motion tracking breath and balance sensors through a sensor vest and spacialised sound.

8:41Davies pioneered the creation of semi-transparent textures enabling the viewer to navigate through luminous digital forest landscapes. Her use of sensor-based interactivity was, at the time, groundbreaking. But prior to that, in a lesser known story, is tha in the 1980s Davies co-founded Softimage, developing intuitive 3-D software that revolutionised the industry by making it accessible to creatives, not just engineers.

9:09 The impact on the wider industry was profound. She said, “It made the technology much more accessible, that is why the company was important at the time. For example, the software was used by industrial light and magic for Jurassic Park. All the scenes with running raptors were animated using Softimage. None of that could have happened without the software.

9:29 The company essentially reconfigured the industry.” Softimage received a technological and scientific academy award for innovation in its implementation of inverse kinematics, for character animation and that was used for Terminator 2. That was a film that also won an Academy Award for best visual effects.

9:47 Softimage successfully transcended the boundaries between the film and game production domains and created accessible design of 3D creative systems that are still used today, driving forward innovation in VFX and paving the way for the most recent technological innovation in the screen industries known as virtual production.

10:06 Even though Davies played an instrumental role in the early years of this company she never received public acknowledgement or recognition whereas her then partner Daniel Langlois was showered with awards. “I was never even thanked”, she remembered, “Yes, I received the stock options, but I was essentially written out of the history of the company.” She revealed very troubling experiences.

10:28 “In 1987, I was not allowed to attend the first meeting for potential investors because it was held at a private men's club where women were not permitted, even though the first contact for such investment had come though me. In 1992 instead of being handed a bottle of Scotch by the investment bankers at the celebratory dinner, I was presented with a pair of black shorts.

10:50 Even though I had worked alongside them on all the offering documents. I always wore pants or trousers, so I assumed this was their way of saying they wanted to see my legs.” The book captures many individual voices such as these through this verbatim testimony, ensuring their experiences are heard firsthand.

11:07 Onto a more positive note. The book laid the foundations for the Fellowship. The Glow exhibition which I created, staged and brought these stories to a much wider audience. Through Glow I curated these historical contributions but also commissioned brand new artworks, each using technology innovatively through a gender focused lens.

11:29 The exhibition showcased the resilience and persistence of women in technology who had continually innovated despite the systemic barriers that they had faced. Situated in a central London location across multiple sites, in an area called Strand Aldwych, which is London’s busiest road, a location with over 14 million annual visitors, it spanned 6 weeks last year, launching on International Women's Day and included a programme of events, talks and opportunities to engage in immersive experiences.

12:78 The sites included The Curiosity Cabinet positioned at 171 The Strand, where I showcased an alternative historical timeline of immersive technology development, in a highly visible shopfront window enabling an exhibition to the seen by passers-by 24 hours a day. Some of the artefacts within The Curiosity Cabinet related to Tamiko Thiel, who is now a prolific digital artist.

12:21Tomiko was part of the group responsible for designing the physical and visual form of the connection machine, at Thinking Machine’s corporation in the 1980s. The connection machine was was the first-ever massively parallel supercomputer, an AI project led by Danny Hillis, who was a PhD student at the MIT AI lab.

12:40 The conceptual design of the supercomputer’s form drew on the Nobel physicist pictured there, Richard Feynman’s design for an internal routing network in the form of a 12 dimensional hyper cube as best exemplified by the logo Tamiko Thiel depicted on the T-shirts that you see being worn here by myself and one in which we included in The Curiosity Cabinet. On the right you can see Tomiko sitting before the computer she designed which is now installed in the Museum of Modern Art.

13:13 On the left Tomiko stands in front of the poster for the infamous Apple Think Different campaign and in it you see Richard Feynman wearing the T-shirt that Tomiko designed. In her interview with me, Tomiko revealed the significant impact this design later had. Joanna Hoffman who she refers to, who is pictured here on the bottom left and on the right you see Kate Winslet playing Joanna Hoffman in the 2015 film Steve Jobs.

13:40 She was friends with Tomiko. Joanna told me a few years after I had left Thinking Machines, when the connection machine came out she was working directly with Steve Jobs at Next. He saw a photo of the machine and said bring me that designer, I want them to design my next cube. And Joanna said I'm sorry, Tamiko went to Europe to become an art student and has no email and I’ve no idea where she is.

14:03 All of this was true, says Tamiko, but now, at least 30 years later, it was confirmed the machine had influenced Steve Jobs' sense of design. You can see that here, on the left we can see Steve Jobs with computers he designed prior to that exchange with Hoffman and then afterwards standing next to the Next black cube which you cannot fail to see has a striking similarity to Tomiko’s original design.

14:27 Someone else we exhibited was Nonny de la Peña, a journalist. She created a seminal VR piece called Hunger in LA based on real-world audio from an incident at a food bank in Los Angeles. A diabetic man was waiting in a queue and he collapsed when his blood sugar level dropped and an ambulance had to be called. De la Peña who coined the term immersive journalism, recreated this event in VR using animated figures to represent the participants.

14:57 Hunger in LA premiered at Sundance Film Festival in 2012 as part of the new frontier program, where these headsets were used to show this piece and enabled to walk around virtual reality for the first time. Chris Milk who you may have heard of, is founder of the VR company Within, and his much-touted 2015 Ted talk on VR as the ultimate empathy machine, he first experienced virtually reality three year’s prior, with this project.

15:25 Using a mobile phone in a headset enabled the viewer to move around freely and to be more responsive to the piece and the characters. The headset used to show the piece was built by a team at the University of Southern California which included de la Peña’s then intern, Palmer Luckey. This was the first iteration of what would become the Oculus Rift. Oculus Rift was sold to Facebook, now Meta, in 2014 for $2 billion from which de la Peña would not have financially benefitted.

15:53 We showed these original headsets as prototypes in The Curiosity Cabinet. And in the same part of the cabinet, you can Rebecca Allen’s 2003 project, Miophone, using subtle muscle contractions monitored by electromyographic sensor, the Miophone can answer and respond to calls without disrupting the activities of the wearer. So, an early form of augmented reality. Incoming calls flashed discreetly in one’s peripheral vision and the caller identities are displayed on the lens of the glasses for the user to see.

16:24 In that 8D picture there, you can just about see Larry Page and Sergey Brin who are the founders of Google. Brin is wearing the eyeglass display during Allen’s demonstration in 2003 and this later sparked their interest in thinking about eye glasses which led to the invention of Google Glass, something for which Allen wouldn’t have been publicly credited.

16:46 These interactive animated portraits, entitled Lip sync, were created by 1981 by Peggy Weil, a member of the MIT media lab. The installation which we featured in the Glow exhibition reprises this work using a keyboard text and joystick for interaction. These demonstrations in 1981 were the first of their kind, giving the computer a real-time talking expressing face utilising a voice synthesiser and eye tracking.

17:13 Peggy Weil saw this work as a new form of puppetry allowing the viewer to directly manipulate the image in real time, and what is an early precursor to what are now referred to as deep fakes. As Peggy stated, a book was written about the media lab by Stewart Brand pictured here. There is an account of this to which you can just see the image there of Lip sync, but her name is nowhere mentioned. Which is in contrast to the other piece which is pictured there which the name of the male creators are cited.

17:40 Other pieces included the first virtual reality movie we exhibited in the cabinet, an interactive experience by Nicole Stanga and the first full haptic joystick by Margaret Minsky. Margaret Minsky’s research into haptic technologies provided the foundation for tactic feedback in virtual environments, today used in computer gaming and sensory immersive experiences. The importance of this work does actually feature in Howard Rheingold’s book.

18:08 This is Donna Cox pictured here who cocreated the first virtual reality camera choreography system, virtual director. It is the earliest realisation of today’s virtual production systems. Virtual director not only enabled the creation of real time 3D visualisations, it also the opportunity for remote collaboration. All of these examples underpin virtual production and immersive technologies that we see today and these are just a handful of the many contributions that have been made and are included in this book.

18:40 In all cases these individuals received inadequate recognition for their work as it was commercially exploited. The women undertook creative innovation while men received credit and profit. This now continues, unfortunately, with Silicon Valley's commercialisation of Artificial Intelligence.

18:58 But what was truly inspirational is how these innovations emerged through collaboration, with artists and technologists working together in teams using imagination and creativity, the exact skills needed for our future.

19:12 While illuminating the overlooked contributions of the past is crucial, Glow also aimed to shape the future through four brand new commissions. These pieces, each created by artists from diverse backgrounds explore critical contemporary issues through a gendered lens, presenting new and imagined futures that are gender-diverse, socially conscious and equitable.

19:33 The commissions include Violeta’s augmented reality installation with AI-generated portraits of her Andean imagined grandmothers and Lisa Jamhoury exploration of the human body in virtual space. Yarli Allison work was about the speculative biotech future addressing gender health caps. And Rebecca Smith's environmental data visualization illuminating the impact of climate change. All exemplify the harmonisation of arts with technology.

20:03 Glow now continues as a social venture to champion gender diversity and creative technology supporting essential skills and resilience in IP creation and protection, technology transfer and commercialization, the skills that all future artists are going to need. As arts institution leaders you understand what is at stake in this AI revolution. You recognize these patterns because many of you are actively countering them.

20:28 You’ve long championed technology integration with artistic practice, preserving human creativity. The stories of the women trailblazers that I’ve shared perhaps aren't necessarily revelations to you, they affirm what you already know, that genuine innovation emerges at the intersection of artistic vision and technological experimentation.

20:47 You are uniquely positioned at this critical juncture, while other institutions such as my own current institution are only recently attempting to incorporate creativity into their curricula, you have cultivated these approaches for decades.

21:02 The educational landscape will now turn to you for leadership and guidance. And despite the funding pressures that we must acknowledge, you have a powerful platform. Your institutions nurture qualities that AI can never replicate, deep creative thinking, empathy, ethical judgement and contextual intelligence, capabilities that are most valuable for our future. Many of you already make visible marginalised contributions, foster cross-disciplinary collaboration and develop a full spectrum of intelligence in your students.

21:33 So, continue with confidence, you're not following the trends, you’re going to be setting them. The window to shape AI’s impact remains open but not for long, so you hold significant influence. Be bold in asserting the values that underpin arts education, be vocal for creative practice as essential, not optional. 21:51 Your experience in nurturing human creativity is exactly what our technological future needs. Here in Manchester, the birthplace of both the Industrial Revolution and the computer, we are reminded technological revolutions need artistic and humanistic guidance.

22:06 While others may focus narrowly on tech capabilities, you understand the more important questions centre on human capabilities, how we create, connect and find meaning. The creative future is worth fighting for and you will be the most qualified champions. Your institutions will cultivate visionaries who will be critical to the sustainable and equitable growth of the Creative Industries who will harmonise technology with humanity.

22:31 So stand firm knowing that the arts are not peripheral to our technological future, they are central to ensuring it serves authentic human expression and potential. Thank you for your leadership, your vision and your unwavering commitment to creativity in all its forms. Thank you.