Faking It

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Channel Four surprised us with last year's *Alternative Christmas Message*: instead of hosting a speech by the likes of Doreen and Neville Lawrence, the Reverend Jesse Jackson or Quentin Crisp – all of whom have delivered messages since the channel initiated the strand in 1993 – this year the Queen herself graced the public with a very alternative message. But her description of 2020 as "a year when most of you, thanks to toilet roll shortages, have experienced what it's like to have a predicament on the throne" was deliberately startling, inviting viewers to look closely at the images. This was, in fact, a 'Deepfake' of Elizabeth II, in which the face of the monarch had been digitally swapped onto that of actress Debra Stephenson.

The intentions of the film's director, William Bartlett, and Framestore, the VFX company where he produced the short sequence, was to draw attention to a leap forward in how digital technologies can manipulate the moving image. Filmgoers are already accustomed to some extraordinary examples of Digital Face Replacement (DFR), with examples such as the resurrection of Peter Cushing to reprise his role as Grand Moff Tarkin in Gareth Edwards' *Rogue One A Star Wars Story* (2016), which swapped the deceased actor's head onto the body of actor Guy Henry. These were achieved at huge expense using similar VFX processes that were earlier used to adapt human performance into popular CGI characters, including the Andy Serkis-based characters, Gollum and King Kong. Deepfakes change the landscape for DFR, offering a cheaper and more accessible process, meaning that a phenomenon that has until now been a cinematic wonder, restricted to the spectacle of major studio productions, could now enter the mainstream.

Deepfakes use 'machine learning', an Artificial Intelligence process that mimics the neural networks of the human brain in order to learn from video images fed into it. The Deepfaker provides it with source video (in the *Christmas Message* case, Debra Stephenson) and target video (the Queen). In simple terms, the machine learning first watches and learns, then uses its knowledge to duplicate the facial movements of the actor onto the target face. A similar process can be used with audio: the machine learning can listen to voice recordings of a person and then reproduce those speech characteristics in lines scripted for it by the filmmaker.

Deepfakes first emerged in 2017, when a Reddit user employed the method to replace faces in pornographic films with those of his favourite stars, including Gal Gadot and Maisie Williams. The resulting controversy stimulated important debates about abuse, gender, and image rights in the online film industry. Those DF videos had very poor image quality, but because they came from the world of user-generated, open source IT development, the machine learning techniques were shared widely. Rapid progress was made to the point where, today, users can easily make simple deepfakes using applications such as Faceswap and DeepFaceLab.

Separate from the malign world of 'Morph Porn', the origins of Deepfakes as a screen subculture has led to the creation of two clear strands of video output.

Artist Provocateurs

Bill Posters is the pseudonym of Barnaby Francis, an artist, activist and writer whose intention is to create viral deepfake artworks 'to subvert the power of the Digital Influence industry'. Together with Daniel Howe, he created *Spectre*, an installation film artwork that featured at the 2019 Sheffield Doc/Fest. The work became internationally renowned for its deepfake Mark Zuckerberg (see box),

proving how controversies over digital face replacement can be used to highlight cultural and political issues. The deepfakers uploaded their film to the Facebook-owned platform, Instagram, issuing a freedom-of-speech challenge to Zuckerberg. This was well-timed, coming soon after Instagram refused to remove a manipulated video of Nancy Pelosi that portrayed her as alcoholic. Bill Posters has worked on further deepfakes that critique celebrity culture, in which Kim Kardashian, Morgan Freeman and others declare their devotion to a fictitious data control organisation, Spectre.

Francesca Panetta sees her project *In Event of Moon Disaster* (2020 – see box) as not just a provocation, but as a civic project to raise awareness of the developments in moving image manipulation. An immersive artist in documentary and journalism, Panetta's work is experimental and at the forefront of research - she produced the film while working at MIT's Centre for Advanced Virtuality. Her interest is in how new technologies such as deepfakes enable the manipulation of the film and television archive, but sees the technique as part of bigger developments in moving image culture.

Playful satirists

Messing with the online archive of film classics is a favourite pursuit of deepfakers, in particular the swapping of the faces of stars in their favourite films. Users of FakeApp have a predilection for recasting Nicholas Cage, who appears on Youtube in multiple roles including Lois Lane and Indiana Jones; in similar vein, Mr Bean takes over from Anthony Hopkins as Hannibal Lecter. These face replacements extend the fan culture surrounding mainstream movies, demonstrating the makers' love for Hollywood cinema even as they lampoon it. Their deepfakes are far from convincing, the makers seeming to exult in the rough-and-ready amateur quality. But other producers have begun to professionalise this playful subculture. In Los Angeles, the company Corridor Crew use high-end computer processors to show-off the potential of deepfakes, with online videos in the form of highly-engaging 'Making Of' productions that describe and celebrate the team's geeky DF virtuosity. In 'We Made the Best Deepfake on the Internet', they show how they create a mock video featuring a surprise visit by Tom Cruise to their studio. Their highly successful mockumentary with Keanu Reeves (see box) cleverly adopts a camera style that hides the technical imperfections of deepfakery. This film's 14 million Youtube views demonstrate the Corridor Crew's ability to monetise their DF work through comedies that engage their audience's love of cinema.

Impact on the film industry

Deepfakes are seen by those close to the studio film industry as a means of doing more VFX, cheaper and faster. In Los Angeles, Corridor Crew's Niko Pueringer declares that "it represents a fundamental shift in how visual effects are going to be done in the industry. We've reached a point where AI and machine learning can potentially let anyone create a shot that before then has been impossible." But this technological exuberance has opened the door for movie industry chancers who underestimate our complex reactions to deepfakes. In November 2019, Anton Ernst and Tati Golykh stirred a huge controversy over their casting of a deepfake James Dean for their movie project, *Finding Jack:* "We searched high and low for the perfect character to portray the role ... after months of research, we decided on James Dean." The reaction of critics and fans was disgust. Slated for release in 2020, the project sank and today gets no mention on Ernst and Golykh's company website, Magic City Films. But they had effectively run a deepfake up the flagpole to gauge public and critical reaction to the possibility of film star resurrection.

Others see a more wide-ranging cultural impact that opens new possibilities for the role of the moving image. Francesca Panetta describes her work as exploring "the ambiguity between reality

and non-reality, and how truth and fiction blur". Discussing her alternative, tragic version of the Apollo 11 mission presented in her deepfake video, she muses that "it's documentary-like, almost magical realism; it's speculative histories/futures." For Panetta, the new technologies of image manipulation could allow us to represent alternatives to traditional historical narratives - the moving image equivalent of replacing the statue of Bristol's slave trader, Edward Colston, with forgotten figures from that period of history.

Ethics and the law

The creation of deepfakes exposes major ethical dilemmas for filmmakers, as well as challenges to the law. Experimental projects such as *Virtual Maggie*, a sequence that seeks to digitally resurrect Margaret Thatcher for a new period movie set in 1989, deliberately focus attention on the need to protect reputations. While living film stars and celebrities can use defamation law to protect against the abuses of deepfakers, the UK has no legal protection for an individual's image after their death, so deepfakes of the deceased are an ethical and legal No Man's Land. Copyright protection for the owners of film footage manipulated by deepfakers is a further problem. The machine learning process does not involve the copying of faces from existing film – instead, the AI watches and learns from thousands of frames – so current copyright law cannot protect rights holders.

The film industry has only recently begun addressing the ethical and policy issues raised by deepfakes, with a new network of Film and TV industry stakeholders, screen academics and lawyers assembling this year to debate the problems. The BFI's research department, led by its director Dr Barry Dixon, has committed as a partner to the venture. The context may be a dangerous one for filmmakers. A deepfake 'moral panic' has convulsed the political world, following DF videos of politicians delivering speeches that they never made. Severe legal restrictions on deepfakes are already being mooted. The issue is whether new laws can avoid stifling the positive creative potential of deepfakes while protecting individuals from abuse.