FACE FRACKING

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FIG. 1
BERTOLT BRECHT
PHOTO: PAUL HAMANN

> *"God hath given you one face and you make yourselves another."*
> *Shakespeare,* Hamlet

Imagine you wake up after a bad night with little sleep, facing shortly ahead an extremely important video conference. The mirror tells you that this is not a winner's look, you have to do something about it.

Imagine you recall last Sunday's face you recorded, when you were in best of moods, well rested and with persuading looks. A semicircle with your phone-camera around the happy visage was perfectly enough, and now the registered mesh fits fine for the upcoming meeting. Nobody will notice any fake since you are speaking in real time with not a split second of delay. Your opposite will never remark any difference, even with the best will in the world. The screened face comes in perfectly true appearance with an original voice and live reactions. Bright smile, perfect performance and a convincing presentation of yourself.

> *Berowne: "Now fair befall your mask!"*
> *Rosaline: "Fair fall the face it covers!"*
> *Shakespeare,* Love's Labours's Lost

The face marks identity and variability of the same. What we project into a face is often our idea of what might hide behind it—or, more generally and seen from both sides of the surface: what we presume lies on the other side of the mask. Just as the Greek term "pros-opon" for face stands for the seen face, the visage open to my eyes, while the Roman "per-sona" means the sounding through the mask, referring to the source behind it (Belting 2013: 65). So what happens when digital transformation can manipulate our perception? When faces on screens, be it computer, TV or smartphone, just like synchronized voices, can be assigned to any person's head? (Castillo, Legde, Cunningham 2018).

In 2019, we planned to develop a method for producing and deciphering facial recognition. For this purpose, we proposed to join the expertise of the two most competent types of "facial counterfeiter": actors and programmers. We called the project "Face Fracking" and wanted to produce paradigmatic mediated faces in order to device a set of features that create a sense of and for authenticity. We wanted to investigate in the variations of actability (Bespielbarkeit) of others and make digital transformations of human faces recognizable

and trustworthy. Actors and programmers in a combined expertise to explore how false appearances could be revealed as false appearances, criteria for the transparency of digitally transformed faciality.

Given the ubiquitous presence of mediated faces one may rightly ask oneself to what degree the portrait *(Das Konterfei)* may be a counterfeit *(Fälschung)*. The digital mediation of appearance on screens such as monitors and digital displays makes it possible nowadays to cheat and to replace any face with any other or by an avatar, an Animoji (Zell, Aliaga, Jarabo, Zibrek, Gutierrez, McDonnell, Botsch 2015). This is no longer limited to still images but is also possible in real time for video conferences, skype and zoom and other meetings, WhatsApp chats etc. We no longer have any certainty of who is there on the other side of our display. Sixty years ago, Erving Goffman began his groundbreaking publication *The Presentation of Self in Everyday Life* with Chapter One *PERFORMANCES. Belief in the Part One is Playing* (Goffman 1959). Today we have strong reasons to treat any digitally mediated likeness with suspicion. Even familiar faces are no longer trustworthy.

On the other side, when Benedict Cumberbatch is performing MoCap as Smaug for the film *The Hobbit,* when Andy Serkis performs Gollum for *The Lord of the Rings* trilogy (Jackson [director] 2001–3, 2012–14), the digital characters are instantly recognizable as avatars of the actors. Why? How does one detect this uniqueness? Are there any objective criteria? To what degree is there a singularity distillable? (With/Kaiser/Wehrle 2011)

> ***That's all one; you shall play it in a mask, and you may speak as small as you will.***
> *Shakespeare,* A Midsummer Night's Dream

"What's the best method for determining whether or not someone is trustworthy? Given the choice, should we trust a thorough background check, a polygraph, or a simple gut-check?", asked the Intelligence Advanced Research Projects Activity (IARPA) in "an era when the trustworthiness of the media, public figures and more is increasingly fraught".[1] A recent study by Perdikis et al. indicates that our brain processes unnatural, yet biologically plausible, facial emotional expressions (FEE) with different neuronal mechanisms than natural, human FEEs (Perdikis 2017). The E3 Lab in Geneva declares the need to study expression production and perception in a single paradigm using the tripartite emotion expression and perception model (TEEP) on the basis of clear theoretical predictions (Scherer/Morillar/Maru 2015, Mehu/Mortillaro/Bänziger/Scherer 2012). A framework is required that allows us to focus on the nature of the production mechanisms and the underlying determinants.

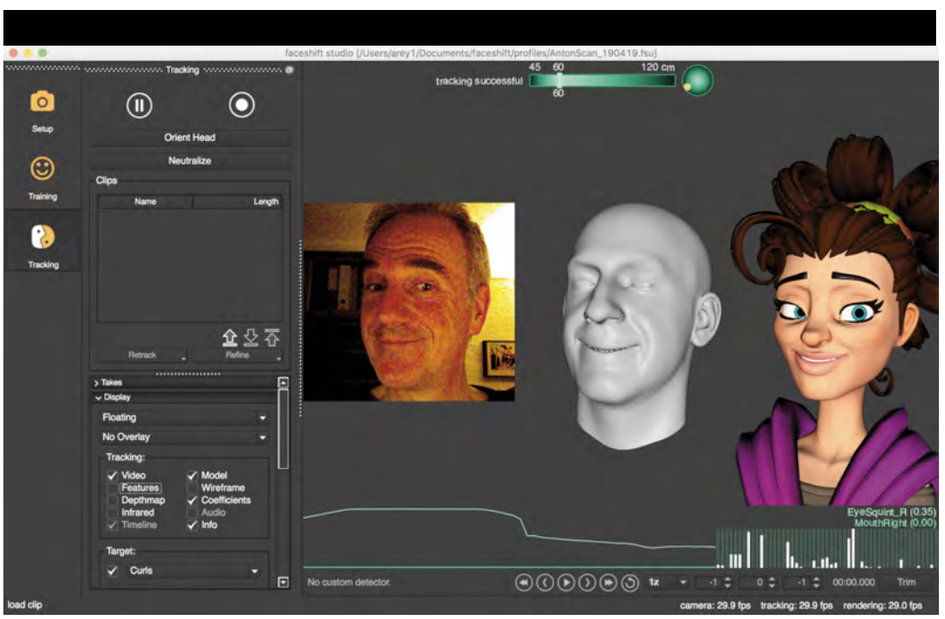

FIG. 2
SCREENSHOT OF ANTON FACE-SHIFTED IN REAL TIME TO 2 AVATAR VARIANTS

This corresponds perfectly to the question of authenticity. If nothing is "behind" anymore, if the mask cannot be torn off, if the surface itself becomes "authentic", then criteria for the differentiability between fake and non-fake can only be derived from scanning the surface. Differences result from nuances in the surface; differentiation becomes a forensic

1 See https://www.iarpa.gov/index.php/newsroom/iarpa-in-the-news, last 16.2.2019

search for tiny signs, markings that can reveal the fake, the seams, sutures, hems, the pixels. IARPA is developing a novel biometric screening method to be used for "trustworthiness assessment techniques (like a gut-check) and technologies (like a polygraph)" (Caeppellet-Lanier 2019). This Credibility Assessment Standard Evaluation (CASE) will determine credibility and trustworthiness through algorithms.

But what we proposed was an approach to the "mask" from the other side. Not the detection, rather the production's page of a faked face. To our knowledge face swapping, face masking, facial performing etc. have not been investigated from the producer's point of view, i.e. the artists and programmers; as it were from behind the screen, from inside the monitor. Facial expressions and their communicative value have traditionally been studied by observing either static photographs, films or videos. The standard method is to assess the results, not the production of these artefacts. The novelty here lay in manufacturing a series of adequate avatars in order to investigate the relation between performance and the perception of facial appearance. For this, the programmer and avatar-designer indeed needs the feedback and instructions of the artist, just like a good mask maker needs the experience of the actor (or a saddler needs the horseman, as Plato would say). We outlined a long-term survey by a reciprocally inspired team drawn from two disciplines, systematically developing tools for experiencing, verifying and deliberately falsifying facial expressions on screens. The physical appearance of emotional expressions including tears, blushing, and others, would be systematically reconsidered and compared to the existing literature (Nowak, Fox 2018).

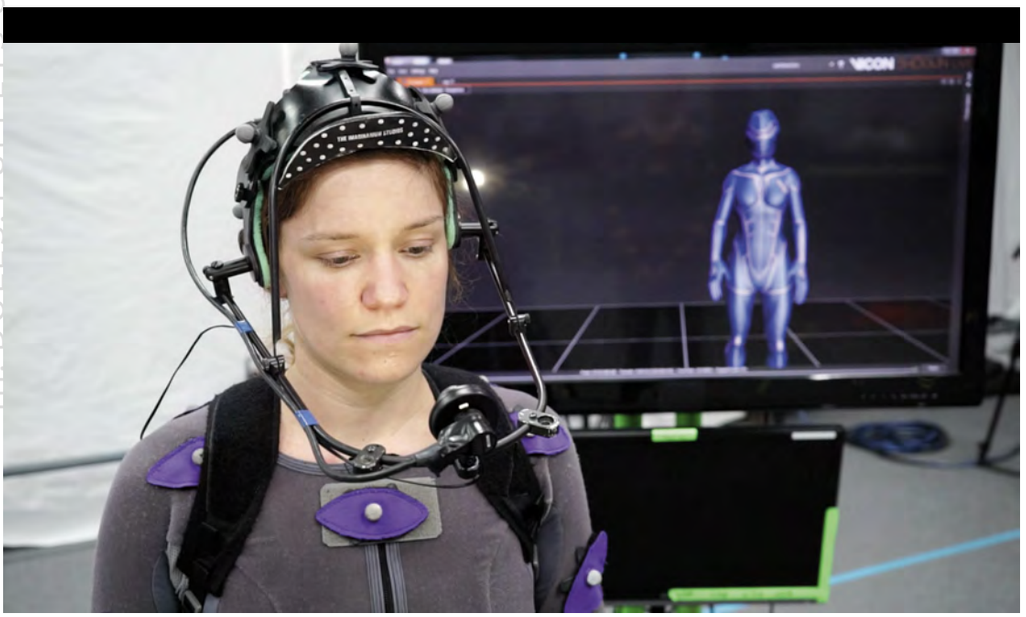

FIG. 3
STILL FROM A SERIES OF TESTS WITH AVATARIZED ACTING STUDENTS, 2017 ©IPF/ZHDK

We demonstrated that using different acting techniques can put forth an expertise in characterizing a virtual avatar. The common desideratum was usually the missing software expertise from a computer scientist. By combining computational and artistical, digital and analog approaches, if the two sides of the term techné could be merged and the common gaps between the disciplinary categories of art and technology united—thus, the screen's surface would become a perfect research platform.

BUT WHY "FRACKING"?

> *To have no screen between this part he play'd / And him he play's it for*
> *Shakespeare,* The Tempest

"Fracking", also described as hydrofracturing or hydrofracking, is a stimulation technique in which a high-pressure injection is creating cracks in deep-rock formations in order to

extract natural gas, petroleum or brine. *Face Fracking* was far less savage. No liquid were to be injected in any faces or masks. Yet the metaphor of fracking fluid seemed adequate to describe the stimulation technique. Our approach should serve as a tangible example that could lead to insights by acting with computer-generated faces and to illustrate an appropriate acting theory to apply to common communication devices. Another potential outcome would be an epistemology and a handbook of acting with digitally produced faces. A guide for professional and amateur performers, how to screen yourself.

In a first movement of the experimental setting, we would experiment on how emotions are performed under the special conditions of live feedback. The simultaneity of mirroring and performance, the specific characteristic of different software would play a central role. Three experimental groups with different degrees of acting experience were tested with a various emotions and corresponding feedback loops. Laymen, acting students, and actors were asked to depict the feeling of fear/anger/joy/sadness within a period of 30 seconds and look at the screen.

With the following qualitative analysis, we will be able to define categories for emotional performance. The test persons are asked about their inner (cognitive and emotional) processes by video cued recall. Differences between the performance of emotions under different conditions will be worked out.

This material could also be used for neuropsychological research. In this case, the live animation plays a minor role and can also be used on existing material in postproduction. Variable avatarization become an independent variable in neurobehavioral experiments.

In a 2nd movement, consisting of practice based artistic research, we would then further develop the avatars according to the results from part one. This would explore different appearances and masks without being restricted to neutral masks, followed by comprehensive documentation!

The 3rd movement were to be the publishing and discussing of the core questions:

- How does the live feedback loop with the avatar (more precisely the digital mask) influence the performance of emotions?
- Can concepts and techniques of acting (mask theories, identification theories, role theories) help to describe and explain these processes?
- Can the specific practical knowledge of actors help to explain these processes?

> ***Why, I can smile, and murder whiles I smile, / And cry 'content' to that which grieves my heart, / And wet my cheeks with artificial tears, / And frame my face to all occasions.*** *Shakespeare,* Henry VI

In the 1970s, Jacques Copeau started to rigorously detach the act of performance from the "prison of self" (Copeau 2015: 81). The neutral mask became a way of understanding performance, not a way of performing (Ewans 2015). This has delivered groundbreaking insights for decades of acting students and professionals worldwide. Yet aside from the secluded Swiss start-up "Faceshift", hardly ever attempts had been made to develop a neutral mask as a digital reference point for understanding the developing phenomenon of face-swapping.

The NRP77 call for "Digital Transformation" used a picture with a crowd of people seen from behind, handling mobile devices to record a concert, performance or presentation. We found this a suitable placard to question the interrelationships and concrete effects of digital transformation and wanted to focus on how communicating with facial appearances could be used as tool like a costume, mask or means of concealment.

We promised a systematical analysis of how acting skills, developed for the needs for performing an avatar or alien face, combined with the development of a digital neutral prototype face,

FIG. 4
THE NRP77 CALL FOR "DIGITAL TRANSFORMATION"
HTTP://WWW.SNF.CH/EN/RESEARCHINFOCUS/NEWSROOM/PAGES/NEWS-200128-START-OF-NRP77-DIGITAL-TRANSFORMATION.ASPX; LAST 24.5.2021

adaptable to multiple applications, would produce methods for assessing recognizability through mediatized facial appearance. The use of avatars would be scrutinized within the actor's education system and also transferred to a wider set of usages, beneficial to the public. The knowledge outcome would hopefully be applicable to a range of communication tools like WhatsApp, Skype, Viber, Faceshift, Face2face, FaceApp, FaceSwap, MSQRD, FaceRig, MakeHuman and others.

We expected our results could also be picked up and furthered by researchers and affiliates, and that they could be of use to a wide range of non-scientific observers of global social change. Our results would contribute to the developing discussion on issues surrounding cyber-security and authenticity. Last but not least we strongly believed that the intellectual, practical and experimental intercourse, accompanied and supported by practical and mathematical education systems would provide innovative and relevant insights.

Yet the projects pre-proposal, not part of economy, labor market or education, but part of the Research Module "Ethics, trustworthiness and governance" of NRP 77 "Digital Transformation", was rejected.

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