Exploring the Potential of Apple Face ID as a Drag, Queer and Trans Technology Design Tool

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ABSTRACT

This pictorial is the result of a long-term research project focused on finding opportunities to use Apple Face ID software and infrastructure to build new hybrid identities, exploring its potential as a drag, queer and trans technology design tool. The aim of the project is to validate new paradigms for identity ambiguity, multiplicity and fluidity, using biometric artificial intelligence systems and technologies of control as tools for free identity expression, definition and personal proclamation. To do that, we present our motivation, methodology, approach to exploration, workshop results and validated outputs, and analyse the physical and digital implications of the research. The prostheses shown in this paper are functional, and allow users to train Apple Face ID software to design their own identities connected to their name, Apple ID Number, bank account, social networks, and any other data or on-line activity digitally associated to this persona.

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Authors Keywords

Apple Face ID; Drag; Queer; Trans Technology; Facial Recognition; Biometric Artificial Intelligence; Identity; Gender; Race; Digital Identity; Identity Expression; Multiple Identities.

CSS Concepts

•Human-centered computing~Interaction design~Interaction design process and methods~User centered design

1 INTRODUCTION

Biometric artificial intelligence, as a parametric indicator, is confronting the traditional meaning of the face as the universal human representative. That our “biological” face is the most influential physical feature in validating identities rings true intuitively. It is not surprising to think that facial recognition is the most influential, functional and widely established resource used to define who we are. What is surprising is that through new technologies, this most basic aspect of identity formation is becoming transformative, in radically problematic ways. Now, more than ever.

Face-tracking technologies, like all biometric artificial intelligence, only exist in relation to bodily surveillance. Military purposes, scientific research, individual and mass observation, epidemic monitoring, and public, private, social and political pursuits, have resulted in new and complex biometric control technologies and

software [1]. These systems are designed not only to see, but to confer advantage: to detect, to verify, to identify, to recognize, to define, to classify. But to recognize what? (see Figure 1)

Figure 1: Apple Face ID setting up a new identity.

By recognizing someone under pre-established social, cultural and institutional systems of sex and gender identity, these technologies and softwares are potentially discriminatory for transgender (shortened to “trans” for the remainder of this paper) and non-binary individuals and communities [2, 3], as well as black and other marginalized races and ethnicities [4, 5]. They also are limiting, non-inclusive technologies for the expressions of drag and queer stances, transfeminist positions and other activist viewpoints [6, 7, 8].

Trans and non-binary individuals and communities have been fighting against cisgender paradigms of identity misclassification for years, in their struggles for physical acceptance and for social, cultural and institutional recognition. Now, on top of that, global systems of biometric artificial intelligence, such as face-tracking technologies, are again threatening their freedom of expression of identity through automatic gender recognition software [9, 10]. Artificial intelligence is pathologizing, misgendering and excluding individuals and communities throughout its normative parameters of gender, race and class [11], fuelling machine-learning software that is learning the wrong way because it is being taught the wrong way.

Nevertheless, biometric artificial intelligence also provides an amazing opportunity as a powerful design tool for the expression of identity. Following drag and queer methods and methodologies [12, 13] by using our bodies as tools for identity expression, definition and personal proclamation, we seek to pervert surveillance [14] and its embodied data [15] as site of opportunity, disruption and resistance. Additionally, employing Oliver Haimson’s research for defining and designing trans technologies [16, 17], we have explored the potential of Apple Face ID as a trans technology design tool.

Our approach is based on the following: before the appearance of biometric artificial intelligence, we could only explore and express our physical identities, and consequently confront its limited, non-inclusive and discriminatory classifications. Now, with the appearance of these technologies led by Apple

Face ID, we can also explore, express and design our digital identities under our own parameters – not only a singular identity, in fact, but multiple ones.

Apple Face ID represents a powerful example, but regarding identity, we found plenty of other biometric artificial intelligences [18] that will always open up new opportunities and scenarios due to the fact that they exist. If a company, state or service creates or needs a technology for any identity-control related activity, that means that they will need to see, to detect, to generate and validate an identity. The act of analysing someone in order to extract information and generate an identification requires a system that, with time and knowledge, can be controlled, amplified and overexposed, exploiting its potential and benefiting from its provided opportunities, designing justice [19] even if it was never intended to help us in that way. In relation to biometric artificial technologies it seems clear that every effort to spy, surveil and control the human body can turn out into a new method or tool to design and express our own identities and, by doing so, establish new challenges, paradigms, interactions, values, solutions and expressions of digital individuals and virtual communities.

2 WHO AM I? FROM FACIAL RECOGNITION TO IDENTITY EXPRESSION

I get up in the morning and I take a shower. I choose my clothes and I get dressed. I do my hair and my makeup. Besides my innate features I have certain tools and daily procedures, from fashion to makeup, even some morning pushups, that allow me to inform my physical identity. The physical side of our identity is one that we can partially control. Then I grab my iPhone, and Apple Face ID asks for access. Wait. Who am I facing? Who is looking at me, who am I looking for? I want to make a good impression. Will it notice my brand new lipstick? [20] Is my hair right?. It’s strange that someone or something is asking me to present myself and ask permission to be me. I see my face on the screen, captured by a camera, hoping to be told that yes, I am who I say that I am; that I am myself.

Weird.

User-friendly software such as Face ID, developed by Apple Inc., are very present in our daily lives. They are invisible technologies that lie behind lines of code and clean interfaces, and we hardly realize how sophisticated they are. When iPhone X was first presented by Apple in 2017, Face ID was sold as the new compact and more secure “service” everybody needed on their smartphone. To gain people’s trust, Apple hired some artists to reproduce hyper-realistic human faces to try to unlock the iPhone X. The simulations failed – and that was all the buyers needed: the demonstration that no one was capable of reproducing your own face, impersonating your identity and hacking the system. It was an amazing commercial auto-counteroffensive strategy with the aim of giving more value and a new service and technology without a history.

Facial recognition is not a new technology. From the invention of the RAND tablet [21], created by Woodrow Bledsoe in the 60s using GRAIL (Graphic Input Language), to present-day Apple Face ID software alongside thousands of other face-centred biometric technologies, facial recognition systems have made gigantic advances [22], thanks to the innovation, evolution and progression of graphics, algorithms and artificial intelligence. While other biometric technologies such as fingerprint recognition or iris recognition systems have higher accuracy facial recognition is widely employed thanks to its non-invasive surveillance process. After important qualitative advances during the 90s, automatic recognition during the 00s, and artificial intelligence and machine-learning implementations during the last decade, facial recognition systems are nowadays the most powerful and valuable parametric indicator of today’s monitoring society, and our faces are its most wanted resource.

Biometric artificial intelligence works across a bigger spectrum than we can imagine and it comprises hundreds of technologies, software and systems, completely customized by its required performance. There are

three main functions in which we can categorize facial recognition technologies: search, identification and verification. More than functional aspects of a certain technology, it is important to understand these categories as anthropological strategies of monitoring our behaviour as individuals within society. As proposed during this paper, by understanding their performance, we can exploit the tool of the oppressor for our own expression. In considering where to start there are three main components to consider:

Search: Looking for an individual within the multitude. This is the most complex part of the system, as it needs to detect all present faces and send them through the system to be matched by facial recognition algorithms that try to associate an identity to each of the captured faces.

Identification: Looking for a specific individual whose identity we already know, trying to match their image with multiple faces within a crowd.

Verification: Confirming that a person is connected to an individual identity. The software has someone's data whose identity can be checked, verifying that the face captured by the software matches the given image of the individual.

Apple Face ID is built upon verification systems, although it embraces multiple technologies and devices to support the software as strongly as possible: a 12mm wide-angle and telephoto frontal camera, with features such as portrait lighting with dual optical image stabilization, backside illumination sensors and body and face detection, among others. Furthermore, it integrates a TrueDepth 7mm infrared camera projecting 30,000 invisible tracking dots into users' faces, building a three-dimensional face map that is transferred live to an artificial neural network to create a faceprint of the user that is automatically matched with the database. This summarizes the process and technology used for an action that lasts less than 2 seconds, repeated approximately 120 times per day, in which we approach our iPhone to be told yes: luckily, we are who we say we are. Or not.

3 QUESTIONING IDENTITY: DRAG, QUEER AND TRANS TECHNOLOGIES

During recent years, multiple projects have emerged trying to fight facial recognition systems or its consequences [23, 24]. All of them highlight the issues of privacy and surveillance in such massive, advanced and yet imperfect systems, software and technologies. By impersonating another individual [25] (printing a pair of eyeglass frames), hacking [26] (using makeup), fooling [27] (wearing hyperrealistic resin masks) or canceling [28] (wearing infrared light-absorbing sunglasses), citizens have empowered themselves as active actors in the now imperative conversation about the ethics, legal connotations and unlimited potential of these biometric technologies and artificial intelligences.

At this point, it is clear that facial tracking systems represent a threat for some individuals who are fighting against it by preserving their identity [29] – physical and digital – with their face acting as either the emitter or the receiver in the conversation. Yet we have more options to confront these identification systems and infrastructures than just hiding ourselves from them. Individuals, collectives and communities, past and present, have expressed themselves against pre-established and obsolete social, cultural and institutional systems of sex, gender, race and class identification [30, 31, 32], using their bodies as tools for identity expression, definition and personal proclamation. Employing drag and queer positionings [33], embracing parasitical resistance [34] tactics of complicity that effect subversion from within hegemonic structures or exploring the arts of resistance [35] by discussing the public roles played by the powerful and the powerless. Reproducing some of these practices, we can “face” those technologies, software, systems and tools, by using their own potential for alternative opportunities. By setting our own parameters and purposes we are more in control of our identity's functionality, connotations, aesthetics, power and definition. While applying drag and queer methods that mobilize the possibilities of Apple Face ID and approaching trans-competent interaction design [36], we also explored the software as a potential trans technology

design tool. Technological discrimination at individual and institutional levels regarding gender, race, class or age, can lead to transphobic, homophobic, misogynist and racist behavior [37, 38, 39]. By demonstrating how technology can provide valuable tools for trans and non-binary digital expression and experience, we show how Apple Face ID can be put to work against constrictive paradigms and oppressive social structures.

The process of embodied gender affirmation varies widely across individuals, but could include surgeries, hormone therapy and voice training, among others. By sharing our practical research experience, we aim to expose a design and technology tool that can be functional for trans and non-binary individuals and communities who want to explore a powerful resource for expression of their digital identities.

Haimson et al. [16, 17] defined trans technology as technology that “allow[s] trans users the changeability, network separation, and identity realness, along with the queer aspects of multiplicity, fluidity, and ambiguity, needed for gender transition” and presented their range of possible implementation from “online spaces like social media sites to wearable technologies, physical technologies, or even form-altering technologies”. Haimson's previous research explored Tumblr as a case study for how social technologies can meet the needs of trans communities [16], and the results of its participatory design workshops [17] provide great examples of defining the challenges of and envisioning community-centred solutions to designing trans technologies as indicated by Haimson's workshops, one of the biggest challenges faced by trans and non-binary people is their “Online identity (e.g., difficulty of expressing trans identity online, privacy and anonymity challenges, “real name” policies, sites that do not allow name changes)”.

That directly points us to the opportunity of exploring the digital expressions of our online identity through technology. A concept (technology) that in Sandy Stone's words [40, 41] can also be understood as “prostheses”. Something powerful enough to expand an individual self.

Figure 2: Prostheses training, Apple Face ID set up.

It is at this point where we frame our understanding of the potential of Apple Face ID as a trans technology, as it can relate to online expressions of gender transition or status. Haimson's usually envisions trans technologies as a mechanism of experimenting with one's desired future body (or bodies), establishing or imagining desired forms. In addition to that, our approach aims to explore the opportunities of destabilizing the ontological premises of surveillance systems and its biometric notions of identity and gender as a potential tools for free identity expression, definition, and personal proclamation. Even if we consider Apple Face ID as a constrained tool, it can still be a functional technology for changeability, identity realness, multiplicity, fluidity and ambiguity, among other important parameters for gender transition.

By experimenting for months and conducting a series of design explorations, we developed ways to successfully train the system by create new identities, partly hiding the original ones through wearing prostheses with the facial features of other people. By mixing different facial prostheses, we were able to design a non-physical existent individual who can be trained as a new human by the facial recognition software, connected to our personal

data and any other activities related or associated with it. The present explorations, methodology, workshop results and project outputs aim to be a first step for future open-source scenarios exploring new opportunities for biometric facial recognition systems as identity expression tools. We are not trying by any means to define a common or final purpose for the use of this research methodology, but rather empowering individual exploration of an established and unlimited global system, widely employed and very present in our daily lives.

Ironically, Face ID can now become, more than a security tool, service or surveillance system, a paradigm of free expression for digital identities, giving users the opportunity to design not only their own identity, but as many identities as they want. It represents the opportunity to manage who I am and how I look, while building my digital representation, just as my makeup or clothes help me do with my physical one. By modifying my physical identity, I can be in charge of designing my digital one, and that is a new powerful and unlimited tool. In creating a new identity, rather than trying to impersonate another to access their data, I might just unlink my "real" face from my digital actions and footprints. Perhaps I just want to

modify a part of my face, because I don't like my nose; or I just want to look different for some aesthetic preference or personal trauma [42]. I can manage my identity ambiguity, multiplicity and fluidity or its definition. What about having 20 different identities, adding a purpose to each of them? Perhaps I need to create a new identity because I fear that a hacker will use my real identity from Apple Face ID to access my own data. Although there are limitless possibilities and motivations, the important thing is that now, paradoxically, Face ID provides an opportunity for such expressions.

5 RECONSIDERING MY IDENTITY: THE FACE AS THE INTERFACE

Two research through design explorations and a workshop were conducted during the evolution of the project. The aim of the explorations was not only to study prostheses iterations and gather results, but to discuss physical and digital connotations, empowering individuals to understand the workings of biometric artificial intelligence the complex systems behind face-tracking technology, as well as the opportunities they afford.

No.D	ESCRPTION	FIGURE	OBSERVATIONS		RLT
No. 09	Forehead and eyebrows (David) Beige Plaster		COLOUR	Beige plaster seems great, maybe because there is less contrast	●
			SUBJECTION	Difficult to stand. Could work w/ some skin stickers	
			DETECTION	Everything fine	
No. 10	Chin (David) Beige Plaster		COLOUR	Beige plaster seems great, maybe because there is less contrast	●
			SUBJECTION	Difficult to hang it with plaster. Could work but ugly	
			DETECTION	Worked with and without prosthesis	
No. 11	Cheekbone (David) Black Plaster		COLOUR	Black plaster this time didn't give problems	●
			SUBJECTION	Standing with the glasses but might be hanged by the nose-hole	
			DETECTION	Some problems firstly at training, but succeed! (work harder in this)	
No. 12	Nose and cheekbone (Sael) Printed plaster		COLOUR	Tie dye plaster worked. (interesting to do some printed prosthesis)	●
			SUBJECTION	Nose-hole subjection works pretty well	
			DETECTION	Everything fine	
No. 13	Nose and cheekbones (Sael) White resin with fibers (1,8mm)		COLOUR	White didn't give problems	●
			SUBJECTION	Nose-hole subjection works pretty well	
			DETECTION	Everything fine	
No. 14	Nose (Sael) Blue resin with fibers (1,2mm)		COLOUR	Blue didn't give problems	●
			SUBJECTION	Nose-hole subjection works pretty well	
			DETECTION	Everything fine	
No. 15	Eye (Sael) Blue resin with fibers (1,2mm)		COLOUR	Blue doesn't seem to give problems, but didn't work	●
			SUBJECTION	Nose-hole subjection works pretty well	
			DETECTION	Face Obst. in some mmnts of training but eyes are not likely to work	

No.D	ESCRPTION	FIGURE	OBSERVATIONS		RLT
No. 18	Lower half of the face (David) Blue resin with fibers (1,2mm)		COLOUR	Blue doesn't seem to give problems but didn't work	●
			SUBJECTION	Bite gadget works pretty well	
			DETECTION	Face obstructed. Not even possible to train the sw	
No. 19	Lower half of the face 2.0 (David) Blue resin with fibers (1,2mm)		COLOUR	Blue doesn't seem to give problems but didn't work	●
			SUBJECTION	Bite gadget works pretty well	
			DETECTION	Face obstructed. Not even possible to train the sw	
No. 20	Lower half of the face 3.0 (David) Blue resin with fibers (1,2mm)		COLOUR	Blue is not the problem	●
			SUBJECTION	Bite gadget works well	
			DETECTION	Everything fine	
No. 21	Upper half of the face (David) Blue resin with fibers (1,2mm)		COLOUR	Blue doesn't seem to give problems but didn't work	●
			SUBJECTION	Thanks to glasses, but something better might be thought	
			DETECTION	Face obstructed. Couldn't even train the sw with the prosthesis	
No. 22	Upper half of the face 2.0 (David) Blue resin with fibers (1,2mm)		COLOUR	Blue doesn't seem to give problems but didn't work	●
			SUBJECTION	Thanks to glasses, but something better might be thought (nose-hole?)	
			DETECTION	Face Obst. Eyes are not a likely place to be modified	
No. 23	Upper half of the face 3.0 (David) Blue resin with fibers (1,2mm)		COLOUR	Blue doesn't seem to give problems but didn't work	●
			SUBJECTION	Thanks to glasses, but something better might be thought	
			DETECTION	Face Obst. Eyes are not a likely place to be modified	
No. 24	Upper half of the face w/o eyes (Sael) Blue resin with fibers (1,2mm)		COLOUR	Blue doesn't seem to give problems but didn't work	●
			SUBJECTION	Thanks to glasses, but nose-hole subjection would work	
			DETECTION	Face Obst. Too many facial area covered	

Figure 3: Content table for prostheses analysis such as feelings, shape and volume, functionality or detection accuracy.

Figure 4: Facial features and facial prostheses with higher acceptance results from Apple Face ID software.

As a last step, by working with LGBTQ+, non-binary and cis-gender volunteer participants for a workshop, we have been able to explore together approaches and positions toward those technologies as well as discuss together the potential of the systems as drag, queer, and trans technology tools for identity expression.

5.1 FACE AS THE INTERFACE: FIRST DESIGN EXPLORATION

The first design exploration was an attempt to understand how Apple Face ID works, from an intuitive and practical first-person perspective. We were three participants, all designers, combining non-binary, cis-gender and LGBTQ+ individuals. We took moulds from our faces and made plaster prostheses out of them. We exchanged the prostheses between the three of us, and started to test the software with them. We each worked with our own iPhone, using Apple Face ID as the main design and verification tool (see Figure 2). In order to extract information and compare results, the full process was documented by taking photos and videos for each accomplished or failed step.

Using a customized content table (see Figure 3), we also analysed different aspects of the prostheses, such as aesthetics and feelings, shape and volume, functionality and detection accuracy. Once we had each filled the table with images and prosthesis characteristics, we shared and compared our results. By the end of the exploration, each of us had tried more than 30 different prostheses and we ended up with five facial features and formal prostheses (see Figure 4 and 5) that had a higher acceptance from the Apple Face ID software.

5.2 FACE AS THE INTERFACE: SECOND DESIGN EXPLORATION

The second design exploration attempted to see if the results from the first exploration could be replicated with a wider range of faces. To do so, we asked for up to ten volunteers to come to the studio to create moulds of their faces. The same three participants (all designers, combining non-binary, cis-gender and LGBTQ+ individuals)

Figure 5: Facial features and facial areas with higher acceptance results from Apple Face ID software.

Figure 6: Taking moulds of volunteer faces to create PLA facial prostheses using a vacuum machine.

Figure 7: Some angles and volumes between different users' prostheses from the same facial features, had non-identical verification accuracy. On the left side, the ones with higher accuracy. On the right side, the ones with lower accuracy.

from the first exploration tried prostheses and facial features from ten more individuals. Using the face moulds from the volunteers, we created PLA (a polyactic acid bioplastic) face reproductions using a vacuum machine – an easier and faster production process to create prostheses than plaster moulding (see Figure 6). Using scissors, the three participants cut different fragments from the PLA face reproductions. We started with the five facial features that produced the highest functional detection results from the previous exploration, making some modifications to learn the accuracy limits of each. Once

again, each of us worked with our own iPhone, using Apple Face ID as the main design and verification tool. The full process was documented again by taking photos and videos for each accomplished or failed step. Following the methodology of the first exploration we used a customized content table, where we also analysed different aspects of the prostheses.

The table structure was modified from the previous exploration to be more coherent with the second exploration analysis and expected output, mainly focused on

documenting the accuracy limits of each facial feature. By the end, each of us had tried more than 50 prostheses and we ended up validating the same five facial features and formal prostheses that had higher acceptance results from Apple Face ID in the previous exploration (see Figure 7). We also concluded that there were some angles and volumes between different users' prostheses from the same facial features, that had non-identical verification accuracy.

Figure 8: Documented dynamics, methodologies and experiences during the workshop.

5.3 FACE AS THE INTERFACE: WORKSHOP METHODOLOGY AND PARTICIPANTS

Conducting an open workshop with LGBTQ+, non-binary and cisgender individuals constituted the last step of the research process. It represented the opportunity to present our findings to a bigger audience than previous explorations, sharing our methodologies with them to

validate Apple Face ID as a potential tool for online identity expression. The aim of the workshop was to envision new opportunities for identity ambiguity, multiplicity and fluidity, with a special focus on trans and non-binary people and their inputs and experiences, to explore Apple Face ID as a drag, queer and trans technology design tool. We asked up to 20 people to take part in the work-

Figure 9: Participants free exploration of prosthesis. An example of validated and rejected new digital identities.

shop, recruited through our academic and design practice community. All the participants confirmed that they were regularly using Apple Face ID on their iPhones, gave permission to be photographed and for their photograph to be used for academic and research studies and publications. Among the participants 2 self-identified as trans women, 2 as trans men, 8 as non-binary White, 4 as non-

binary Black, 3 as non-binary Latin and 1 as non-binary Asian. The participants' age range went from 18 to 66. Participants were individually interviewed before and after the workshop. During the workshop and interviews, we collected video and audio data which were later transcribed. We also collected results extracted from the tables of content used by the participants to evaluate and validate their prostheses. Finally, we collected the PLA prostheses designed and worn by all the participants, which were also photographed and documented.

5.3.1 WORKSHOP DYNAMICS AND ACTIVITIES

The workshop started with a group presentation, where we introduced the research topic, methodology, workshop dynamics and proposed timings. The workshop was divided in two parts. The first worked as an introduction to the software and technology. We shared our previous research outputs to present the possibilities and opportunities of Apple Face ID as a tool for identity expression. In connection to our previous explorations, the 20 workshop participants worked with prostheses from the same 10 faces employed during the first and second explorations. Using scissors, they started by cutting different fragments from the PLA face reproductions. Again, they started from the five facial features with higher functional detection results in the previous explorations, making some modifications to learn the accuracy limits of each facial feature in relation to their own faces. Using the same design and verification tool, each of them worked with their own iPhones, using Apple Face ID software. The full process was documented as well, by taking photos and videos for each accomplished or failed step. Once again, following the methodology of the first and second explorations, participants used a customized table, where we also analysed different aspects of the prostheses such as aesthetics, feelings, shape and volume, functionality or detection accuracy (see Figure 8). At the end of the first part of the workshop, we had more than 200 prostheses to analyse. The results pointed to the same five facial features and formal prostheses that seemed to have higher acceptance results from Apple face ID software, coinciding with the results of the two previous explora-

tions. As with the second exploration, we also concluded that there were some angles and volumes between different users' prostheses from the same facial features, that had non-identical verification accuracy.

The second part of the workshop was planned to summarize participants' inputs, ideas, approaches and behaviour in relation to what they have discovered and experienced, according to their own motivations and objectives about the possibility of designing new digital identities. In order not to constrain their explorations, each participant was invited to select three out of the ten PLA face reproductions and freely explore the production of new prostheses, without any restriction or shape-limiting inputs. Using scissors, the participants cut and designed as many prostheses as they wanted. Again, each worked with their own iPhone, using Apple Face ID as the main design and verification tool (see Figure 9). In contrast to previous explorations, participants were not required to fulfil the content table with their results. In exchange, we asked them to present their selected prosthesis to the other participants, sharing their motivations to design them, as well as their results and experience of the process. These individual presentations led us to an understanding of their perspective on those technologies as well as the value of those methodologies as tools for identity expression. At the end of the workshop, participants were invited to keep their designed prosthesis, which were from then on connected to their new digital identities. For that reason, we ensured our participants that their real identities ("biological" faces and names), and their new identities (none of the prostheses shown in the paper are the final outputs) would remain confidential.

5.3.2 WORKSHOP RESULTS

Encouraged to follow interesting outputs from previous explorations, we organized a workshop with LGBTQ+, trans and cis-gender individuals. The aim of the workshop was to share our research findings for the use of Apple Face ID software as a tool for identity expression, while exploring its potential as a drag, queer and trans technology design tool.

Different attitudes emerged among the participants while trying to describe the performative intentions of drag and queer positionings. The complications were mainly connected to the relation between identity and performance, as elaborated by Judith Butler [43]. Besides their positionings and their understanding of gender construction and performance, all the participants agreed that the proposed methodology and design tool allowed them to digitally explore their own perspective. The same position was adopted by trans participants, which also validated the potential of Apple Face ID as a trans technology design tool for free expression. They acknowledged the opportunities of destabilizing the ontological premises of surveillance systems and its biometric notions of identity and gender, while recognizing its functionality for online expressions of gender transition or status. The workshop outputs allowed us to expand and validate previous findings as well as to envision more possibilities, opportunities, implications and connotations of its potential applications for the creation of new digital identities. Participants' inputs and experiences will lead us to our next research step, and gave us the motivation to keep researching the topic.

5.3.3 INTERVIEWS: INPUTS AND EXPERIENCES

At the beginning and end of the workshop, participants were interviewed. The aim of the pre-workshop interviews was to understand their relation to face-tracking technologies.

"Did you ever think about how your face is recognized or identified through these softwares? Can you try to explain it to me?" Ana (all participant names are pseudonyms) answered that "I suppose that the software measures distances between our facial features and knows who we are." In summary, words like dots, codes, mesh, distances or facial characteristics were the words most used to explain how the software "reads" our face. In this sense, all the participants were able to approach the topic, and make a more or less reasonable guess about its functionality. All of them confirmed they were using Apple Face ID, and so we asked them "Was this an au-

tomatic or considered decision?”. Participants’ answers helped us understand what took them to use this service on their smartphones. David answered: “Automatic, because it’s easy and fast, it represents a commodity”. Six of our participants also confirmed that the decision was automatic, as they directly understood Apple Face ID as a security tool protecting access to their iPhone and data. Mike, one of the participants who pointed to the security benefits of the software added: “People say that I am giving personal information. Of course I am giving personal information, it’s what allows me to be the only one accessing my phone, it is a customized service.” In a similar direction, thirteen other participants also gave security reasons for using Apple Face ID, although as a considered decision. On top of that, Andrea pointed out: “They [Apple and/or tech companies] already have all my data, so at least they make things easier for me.”

Post-workshop interviews provided an opportunity to evaluate how our research introduction and their practical experience during the workshop had impacted their perspective on these technologies and software. The end purpose of the questions was to understand if, as proposed, Apple Face ID could be validated as a drag, queer and trans technology design tool. We asked several questions: “Can you describe in your own words what you did

today? How did the experience you just had make you feel? Did you feel like a different person while wearing the masks?” Almost all the participants expressed surprise at being able to design their new digital identity. In Teo’s words: “It is crazy ‘cause you look at yourself in the camera and you know that this is not the face that you have, but then you train the software and it allows you to create an identity and you see your name attached to it, and it’s like, what?” Ana said: “I felt like myself, but a different self. I keep feeling like me, but I feel that my attitude changed with every prosthesis I wear.” On the decisions they took during their explorations, Teo expressed contrasting motivations: “I chose the first one because I liked its eyebrows. The second one because I thought the nose was similar to mine and I thought that maybe it would work. The third one I chose is the one I thought was the most different face to mine, to see what would happen”. The motivation to explore facial features that were really different from their own was explored by a majority of the participants, as addressed by Arnau: “I have been able to look for something that I like and I don’t have. I felt attracted by the most different faces.” Two cis-gender individuals also commented that they felt “disguised” wearing some of the prostheses. Eva pointed to a functional parameter for her decision: “I chose a big nose so it would allow me to breath under it.” In rela-

tion to the proposed exercise of creating their new digital identity, our main objective was to understand their attitudes towards the implications and connotations of biometric artificial intelligence as potential tools for identity expression, as well as to envision diverse motivations for the creation of new digital identities. Some of our questions were: “Are you going to use those prostheses? For what purpose would you use them? What other motivations do you think could lead people to design and use their own prostheses?” Bruno answered: “At first it felt as if I was supplanting someone’s identity, but actually you are generating a new one. You have your own face, you wear some facial features from another individual, and the mix creates a new one, a different one. That is me, but is someone else.” Kat envisioned expanding scenarios for use: “I would try it at work, as we have face identification systems to access the building.” Pol added: “I will also use it in the street, designing my physical identity. I will keep my real identity as my digital one. Does that make sense?”

To our proposal that Apple Face ID could be validated as a drag, queer and trans technology design tool, participant’s answers in the debriefing were positive. They contributed with interesting insights as well as new perspectives and challenges. Teo said: “I understand its po-

Figure 10: Mariona

Figure 11: Marta

Figure 12: Ignacio

tential for a long-term transition, but there is something powerful too about temporary prostheses. You can easily change, mutate, explore. It allows me to be digitally updated during my transition, creating prostheses that match the different phases of my transition.” An overwhelming majority of participants used the word “explore”. In Ana’s words, “I feel safe having the power to decide who I am. I will keep exploring that. Exploring it digitally, as I keep exploring it physically.” Almost the same percentage of participants highlighted the opportunity to “change”, “disconnect from” and “play with” the correlations between their face and its associated data. For Joan this was empowering: “As my online data is connected to what I was before, but that I now no longer am, the opportunity to design my new digital identity feels right.”

6 DESIGNING AND PRACTISING OUR HYBRID IDENTITIES

In order to exploit what we experienced and learned during the process, we decided to explore the possibilities and connotations of designing digital identities to the maximum of our abilities, and put them into practice during our daily lives and routines. For some months we have created multiple prostheses for ourselves, friends, relatives or individuals who have asked us for it. This has given us valuable information on the daily implications of using facial prostheses with new, single or multiple digital identities. Recently, we photographically documented these experiences. The following images represent a selection of those individuals, their prostheses and their new identities (see Figures 10, 11, 12). All participants gave permission to be photographed and for their photograph to be used for academic and research studies and publications. We ensured the individuals that their real identities (“biological” faces and names) would remain confidential.

7 DISCUSSION AND FUTURE RESEARCH

Our future research aims to consolidate Apple Face ID as a functional tool for identity expression as well as to encourage other individuals and communities to explore

its potential as a drag, queer and trans technology design tool. To do so, we have first to acknowledge some limitations during our research process, such as the majority of white participants in the workshop, and the necessity to own an iPhone to explore Apple Face ID software as an identity expression tool. These limitations can be discriminatory, as they exclude individuals and communities on some of the topics we have been exposing such as race, gender and class.

To work towards a more diverse scenario, we are developing an open-source online tool and DIY kit with the aim of facilitating people’s access to the knowledge and practice required to design their own digital identities using Apple Face ID software worldwide. In the same direction, towards a more inclusive experience into designing digital identities, we will explore other biometric artificial intelligence systems to find new technologies, software and tools that can validate new paradigms for identity ambiguity, multiplicity and fluidity, without having to pay for it, as now happens with Apple Face ID. We will keep exploring the possibilities of artificial intelligence as an inclusive design tool, pointing to its discriminatory behaviour and re-exploiting its potential.

8 CONCLUSION

We have explored the facial recognition technology and biometric artificial intelligence of Apple Face ID, the most widely used system worldwide, thanks to its non-invasive surveillance process. By implementing automatic gender recognition systems, facial-tracking technologies exclude trans and non-binary individuals and communities, causing risk, harm and oppression. This individual, social and institutional discrimination that can lead to transphobic, homophobic, misogynist and racist behaviour. Understanding its performance and functionality, we approached Apple Face ID as a potential drag, queer and trans technology design tool. Applying drag and queer methods that matched the software and its possibilities, and approaching trans-competent interaction design, we proposed Apple Face

ID as a new tool to design and express our own identities and, in doing so, establish new paradigms, interactions, values and expressions of digital individuals and virtual communities. Following a series of explorations and a workshop, we have presented and shared our methodology. As a result of the workshop, we have been able to envision more possibilities, opportunities, implications and connotations of its potential application towards the creation of new digital identities. We hope that our motivations and findings can lead other individuals and communities to explore biometric artificial intelligence systems and technologies of control, as tools for free expression.

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