



DOREEN: A Game of Provocations Creating New Ambitions for Equity in Computing through Intertextual Design

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Figure 1: DOREEN octahedron die with provocations

ABSTRACT

We introduce DOREEN, a norm-critical story-telling game of provocations that displays women’s invisible experiences in computing to challenge barriers to inclusion. Following the principles of intertextual design, we collected empirical narratives from the past experiences of everyday women in computing and embedded these within

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the mechanics of role-playing storytelling games. With DOREEN we propose a playful way of exploring how gender roles, assumptions about computing, and social dynamics shape the experience of students – to reflect on the past with the aim of changing the future. DOREEN makes intertextual referencing to *The Unbeatable SQUIRREL Girl* aka Doreen Green, a computer science college student and a Marvel superhero who finds unorthodox ways (using wit and humor) to overcome barriers. DOREEN is a game to enjoy while engaging in critical reflection on belonging and well-being within computing. DOREEN is centered around an octahedron die and an adventure sheet inspired by tabletop role-playing gaming, emphasizing story-telling as a strategy for challenging norms and creating alternative narratives. The die design invites the players to reflect on how the probability of encountering limiting narratives and structural barriers can be higher or lower for different social groups. Finally, DOREEN is designed as the embodiment of all the people whose experiences, agency, and perspectives should be included in the journey of broadening participation in computing.

CCS CONCEPTS

• **CCS CONCEPTS**; • **Human-Centered Computing, Social and Professional Topics**;

KEYWORDS

computer science, gender stereotypes, research-through-design, role-playing, critical design artefact, norm-critical play, feminism

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1 INTRODUCTION

With this critique and accompanying critical artefact: the game DOREEN we want to acknowledge and display the everyday invisible experiences of women within computer science. In the years between 2010 and 2015, only 81 students out of 874 students at our Department of Computer Science were women – and the first author of this critique was one of them. As a student, the first author left the master’s program in early 2016 for a successful job in the IT industry - and she was not the only one who ended up leaving. Since 2015, the department has initiated and implemented several different strategies, structures, and activities to increase gender diversity - and has been successful in this effort: approximately 20% of new incoming bachelor students since 2016 are women, while the number was around 8% prior to 2016 [9] [22]. However, opening up institutions to those who have been historically excluded from them is not just about improving representation; it is also crucially about reflecting on how we can establish and maintain inclusive culture and needed structural change [12].

To fully comprehend current social dynamics and how they support or hinder conditions for equity, we need to reflect upon past experiences, with the aim of creating discussions and conversations in the present to impact future narratives about computing and to promote inclusivity [2] [25]. To gain insights into the past, the first author interviewed 10 women students. The students interviewed are former and current Computer Science students who started their education at our department in the years between 2010 and 2015 (prior to the introduction of the new diversity initiatives). These ten women make up more than 12 % of the women who started in the Computer Science Bachelor Program during this time frame. All interviews have been recorded and fully transcribed. From the analysis of the empirical material three sets of narratives about computing and gender emerged, which together provide insights into the ordinary, personal experiences of the very few women in a computer science program. Whereas all the students in our interview sample identify as cisgender women, many of the cultural and structural barriers described in this essay also affect the lives of other gender minorities and historically underrepresented groups in computing. We would like to stress that bringing attention and critical reflection upon students’ experiences requires institutions to be proactive, accountable, and willing to become vulnerable in the process of learning to make a change. We are currently

based at such an institution, and we hope other computer science organizations with similar backgrounds will join us so that together we can acknowledge, transform and redefine current norms and create more inclusive environments.

DOREEN is a critical design artefact [21] created to spark change in computing by creating new sustainable futures through reflection, dialogue, and interventions. We are using DOREEN to initiate and facilitate conversation on social norms, narratives, and social dynamics in computing environments. Notions about gender/sex shape computer science in particular ways. Stereotypes and gender norms influence access and participation in computing activities as well as impact people’s sense of belonging – whether they are in education, research, or industry settings. Biased social norms and social dynamics, if left unchecked, also affect how technology is shaped. Feminist Science and Technologist scholars have long emphasized how biased understandings and articulation of “users”, for instance, influence research and technology development, and reduce and constrain the access and use of technology [23] [24]. With DOREEN we propose a playful way of exploring how gender roles, assumptions about computing, and social dynamics shape the experience of students – to reflect on the past with the aim of changing the future.

Our game, DOREEN, is centered around a thought-provoking story-telling game die. The die is an octahedron, on each side of which players can read empirical quotes from our qualitative interviews or critical questions based on our own experience as researchers facing complex dynamics in the classroom. This way, we display both the invisible experiences of the women, and invite reflection on the complexity of what can be done to challenge harmful stereotypes. Besides capturing the marginalized narratives that organize value judgements in computing around gender/sex – like male/female binaries, we also display the marginalizing narratives in computing research subdomains concerning what is considered soft or hard in computing, as well as the different perceptions between technical contra human-centered approaches. With DOREEN we engage people in reflection on how marginalizing narratives are deeply ingrained within computing, and their consequences.

Applying intertextual design [10] we blend references to pop culture - like tabletop role-playing games (RPGs) and the Marvel superhero Squirrel Girl - with quotes and prompts about experiences within computing to engage people in playful critical reflection, with the intention to broaden the conversation on equity in computing. The fundamental questions we seek to discuss based on the provocations displayed in the game are: *What dynamics are caused by preconceived assumptions about gender and computing? How do these impact the experience of women (and other gender minorities) in computing? How can we challenge assumptions in our work as researchers, teachers, managers, administrators, or students?* We invite NORDICHI participants to play DOREEN at the conference and discuss, share, and engage with everyday stories displaying the experiences of underrepresented groups within computing, with the purpose of collaboratively creating new ambitions for where we want computing to be in the future.

DOREEN uses the same mechanics underlying the configuration of byte patterns: This way we emphasize that the experiences of students are multiple, diverse, and – not least - re-configurable. We reference 8-bits computing, inviting participants to configure and

reconfigure 256 (0-255) byte patterns of the students' lived experiences. By repurposing the polyhedron dice shape from role-playing games, we create a playful environment allowing participants to reflect on current challenges to collaboratively envision a better future.

The rest of this essay is divided into two main parts: In the first part we explore Collected Narratives and in the second we explain The Design of DOREEN. The Collected Narratives section briefly documents our empirical data and highlights three main empirical narratives. The Design of DOREEN section introduces the game, tokens, and rules, as well as the material design, form, and interactivity designed to allow players to reconfigure the future ambition of computing by reflecting on the past.

2 COLLECTED NARRATIVES

Our data collection centers the voices and experiences of women in computing higher education. In approaching this theme, we are inspired by the work of feminist scholar Sara Ahmed, who has long examined issues of sexism and racism in universities. Ahmed invites us to reflect on how neoliberal agendas tend to make feminism about the resilience of individuals, rather than focusing on the importance of collectively examining (and challenging) how sexism is produced and reproduced [1]. Sexism, Ahmed notes, is often reproduced by not being noticed (*ibid*). In this essay and in our game DOREEN we explore the experience of 10 women students of computer science, explicitly centering limiting narratives that have been rendered invisible and normalized and invite people to discuss them, explore them, challenge them, and propose ways to counter them.

Feminist HCI researchers have in the last decade increasingly critically brought in and centered the experience of marginalized identities in computing [3] [6] [10] [16] [17] [22] [25] [26] and developed approaches to promote inclusivity, accountability and reflexivity in HCI education and in computing [13] [14] [8]. Aligned with this work, we focus on the experiences of women in computing as they articulate their own experiences with mechanisms of marginalization and exclusion, in order to bring awareness about how values and assumptions related to gender and technology shape computing environments. Madeline E. Heilman defined stereotypes as generalizations about groups in which have two properties: a descriptive and a prescriptive [19]. Descriptive gender stereotypes are binary constructs depicting what women and men are *like* whereas prescriptive gender stereotypes are directed at how women and men *ought to be* (*ibid*, p. 114). She continues by stating that the “descriptive stereotypes promote negative expectations about a women’s performance by creating a perceived ‘lack of fit’ between the attributes women are thought to possess and the attributes thought necessary for success in traditionally male positions” (*ibid*, pp. 114-115). It is important for us not to frame the experience of women and other marginalized genders in computing in terms of deficit (a lack of resilience, a lack of skill). Women are not ‘missing something’ or ‘lacking something’ which makes them ‘less inclined’ to be technically successful in computing [7]. Women and other underrepresented minorities have agency and the perceived ‘lack of fit’ is shaped by social norms and institutional conditions – their agency is constrained or supported by socio-cultural factors. Thus,

to make change, the computing community needs to carefully examine, acknowledge, and challenge barriers to participation and inclusion. Following others [5], our agenda is not to change women, but to change institutions allowing women and other underrepresented gender minorities to pursue their own agendas and impact the computing agenda of the future.

To spark critical reflection, we wanted the narratives and stories on the DOREEN octahedron game die to be grounded in the real-life experiences of the women interviewed for this work. When analyzing the data material, we traced both descriptive and prescriptive gender stereotypes which clearly impacted the experiences of the women. For the purpose of critical reflection, we present three sets of narratives that merged in the interviews and that we used in the design of DOREEN. These three sets of themes were: 1) Normative stereotypes about gender and technology; 2) How attitudes toward human-centered disciplines shape the nature of socially oriented work within Computer Science; and 3) How the transformative role of creative expression and spaces for social belonging were essential ingredients for wellbeing. For each of these themes, we identified and selected key quotations from the women’s experiences.

2.1 Normative stereotypes about gender and technology

All interviewees pointed to the existence of a descriptive stereotypical belief that men are naturally more technically well-versed and that women’s technical abilities are inferior. This stereotyped narrative was embedded in jokes or occasional comments and social interactions on and outside campus, which negatively affected the students and their sense of belonging. Sexist remarks like the one quoted below are a good example of the descriptive stereotyped narrative linking gender and supposedly innate technical skills:

“I heard comments outside of my university, like “You code well for a woman.”

Some students discussed the uncomfortable feeling of being in the spotlight, which added another layer of pressure. As one woman said:

“It was a little intimidating to start, because I was very aware that I was one of the few women, and you get a lot of attention, and everyone quickly knows your name even if you don’t know them”

Being aware of the negative stereotype negatively impacted many aspects of the students’ learning experience. Many of the women for instance reported not feeling comfortable openly asking for help. As representatives of a small minority on campus, they felt it was hard to ask questions in class. Self-confidence was affected too. Some women reported that, if they got a bad grade, they would start questioning whether it was because of their gender - rather than objectively evaluating their personal situation:

“If you were bad at something, was it because you were a woman or was it a difficult course?”

“Failing a course was really tough. You felt that you were that girl who didn’t know how to do anything. It was only in a few courses where 70% of the students failed and where everyone knew that it was a deeply

unfair exam and not your lack of skills, where it was okay [to fail]”

The women felt extra pressure not only to prove themselves as good students – countering the descriptive stereotype - but also to positively represent their gender, as the quote below shows:

“I didn’t want to live up to the stereotype. You feel like you represent your whole gender. If you failed at something, your entire gender failed.”

The experiences we document demonstrate how normative gender expectations risk producing *stereotype threat* [4] [27]. Stereotype threat is a concept that describes “being at risk of confirming, as self-characteristic, a negative stereotype about one’s group” [22: p.797]. Stereotype threat has been shown to affect the wellbeing, performance, and participation of gender minorities in computing, and thus risk countering initiatives for diversity and inclusivity within institutions [15]. Research on stereotype threat and race have documented how simply experiencing or becoming aware of the stereotype can impact performance. Thus, to make change within computing, we need to acknowledge and critically reflect upon descriptive gender stereotypes to find ways to counter them within organizations.

2.2 Attitudes toward human-centered disciplines within Computer Science

Attitudes and norms about gender might overlap with preconceived notions about specific computing subdomains and might be reproduced through institutional practices. One of the stories we collected was related to the experience of selecting a computer science program. The event took place during an Open House event, as the woman explains:

“I went to an open house at [edited] with a female friend when we were picking our university. And we were met with some sexism, so we did just turn 180 degrees and left. They had a booth where you could hear more about the Software Development program. As soon as they spotted two girls approaching, they hid the Java book and said, “Listen, it’s about people”. Great, but you could please not assume? I want to code and learn theory.”

The students were stereotypically perceived as mostly interested in “people” rather than programming, which countered their actual interests. This experience points to the stereotypical assumption that masculinity is linked to hardness and technical domains, where femininity is linked to softness and people - even if there is no evidence that technical domains should be gendered. The existence of specific attitudes towards sub-areas of science matters for the perceptions of domains where some topics are “considered hard, and in the discourse, these are furthermore related to masculinity and given more merit, whereas others are regarded as soft, feminine and given less merit” [28]: p.519. The distinction between what is ‘hard’ and what is ‘soft’ within computing also emerged as a topic in our interviews. Perceptions about what is “real” Computer Science were largely linked with how much programming the course entailed. For example, a woman said:

“There was this idea that Computer Science only counted the programming heavy things whereas becoming a teacher, going into management or user interaction wasn’t real Computer Science.”

These assumptions also shaped, to some extent, the educational path of students. At the time the women interviewed attended their education, Human-Computer Interaction was not a mandatory part of the core curriculum, and some students regretted not choosing that optional course, and explain what informed their choice:

“In general, some courses were seen as less worthy than others. Meaning the programming-heavy courses were definitely the best ones. And that meant I never took Human-Computer Interaction because people said it was silly. But today I would have liked to have that theory with me.”

Another woman mentions that, in her view, this pressure and bias towards what was considered as “real” Computer Science compared to “not real” was embedded within the ways students talked and articulated the program, pointing to the important role of former students in shaping the assumptions about the topics.

“You get pressured a lot towards the tech-heavy courses rather than the more interdisciplinary ones, and I think this is a shame. I am also pretty sure it is coming from the students.”

Two other women further elaborate:

“It became almost elitist in some ways. The more programming work you do, the better it is, hence the more you are worth as a human, almost”.

“The more technical courses were put on a pedestal. I really enjoyed Human-Computer Interaction. But I had to listen to comments about how it did not have anything to do with IT. It was just easy ECTS. It was soft. Same with Project Management. If you were not programming, it didn’t matter”

Prioritizing sub-areas within a field above others matters for the experience of a field. Computing is a newer academic field compared to e.g., Physics and Math, as the field and practice only emerged during WW2, and the first Computer Science department in Denmark was not established until 1970. Digital technology develops at a rapid pace, and no one can predict where the field will be in just 5 years into the future. Human-centered topics and areas are important if we are to develop technology for people, which means that the limited understanding of the ‘real field of computing’ is counterproductive for the kind of skilled experts which are needed in society. Educational institutions and programs are shaped by the assumptions and tacit expectations co-produced by teachers and students. Whom the “implied student” is [28] matters for the experienced behavior and activities which participants encounter in formal and informal educational spaces within the program, and which are crucial factors shaping the wellbeing and attainment of students.

2.3 The transformative role of creative expression and spaces for social belonging

Throughout the interviews, it became clear that joining social groups and extracurricular activities organized by the students were important ways to foster a sense of belonging and build community - and in some cases, these became spaces in which students challenged normative stereotypes. The revue (the university's own musical theatre) stood out as one of the social activities that played a positive role in the students' life, as 9 out of 10 women reported. The revue at our Computer Science Department was created in the early 70s and is a yearly event where students perform the sketches, songs and videos they have been laboring on during the previous year. It is a group open to everyone who has a relation to Computer Science, including teachers - who also often join on stage and in videos. The students create their own band every year, a tech-squad handling sound and light effects together with the videos. They create their own costumes and props, and they also work together with other student-run revues throughout the year. As the below quotes show, students who were actively participating in the revue saw it as a place in which they could be themselves, express their creativity, make friends, and not be judged:

“The revue was a place to be yourself. People didn't care if you drank, or you could code. You could just have a great experience with other people. It probably wasn't ideal that you had to take a week off from studying to do the revue itself, but it was really amazing.”

“I was in the revue, I was a mentor, I was in other social groups. The social part made a difference for how long you would last.”

“In my first year I was really focused on my studies, but I later joined more social groups. I really tried focusing on being social (. . .) The social aspect was really important and it definitely carried me through. I hope it's still like that. It's the only way to get through it. You need someone to talk to - people who relate to your studies and assure you that you are not alone.”

The revue was experienced as an open space for the women we interviewed, where students could be part of a group without having to worry about their gender, dislike for alcohol, or coding proficiency. One of the factors that could support this welcoming feeling was that the revue seemed very diverse. One woman mentions that it was probably one of the social groups at the department where most women were present and participating. Further, the revue was experienced as a place, event, and activity where people could unfold their characteristics without limitations and make new friends.

The material for the revue is usually a reflection about the students' everyday life with a twist of humor and a sense of irony. One of the songs from 2014, called 'Let It Grow', stands out in its ability to challenge normative stereotypes with humor. Based on a song from Disney's animated movie *Frozen*, called 'Let It Go', the satirical song ridicules the stereotype of the Computer Scientist as a bearded man and pushes back with humor against the idea that

women are not naturally technically inclined. The song was performed as a duet between two women Computer Science students - one who really wants to grow a beard in order to fit in and be a true Computer Scientist, and another one sharing how she can accomplish that by simply buying a beard from the local costume store. The song-writing process and the performances show how creative expression through the musical theatre provides a public space to talk about and counter these stereotypes in a clever way.

Is important to us that we included the lived experiences of the women as a feature of our norm-critical artefact. The goal is to critically examine the experience of marginalized students to understand which structures, activities, and practices we need to change and/or strategically prioritize. Increasing diversity is not about changing people to fit into existing structures but changing the structures to allow people to express themselves within the field. We offer the DOREEN game to help people critically reflect and develop future scenarios changing the narratives and practices of computing towards equity and inclusion.

3 THE DOREEN GAME

DOREEN is a norm-critical conversation game that allows participants to become aware of and discuss norms about gender and computing. The game helps players imagine how they can intervene to create a better future. The design of the game blends provocations, playfulness, and story-telling mechanics from tabletop role-playing-games (RPGs) such as polyhedron dice and adventure sheets. The *provocations* are snippets of the empirical quotes displaying the experiences of the 10 women we interviewed, combined with critical questions based on our own experiences as teachers. In total we include 16 empirical snippets, mimicking the 8-bits structure of computing memory in a bite allowing for in total 255 different combinations of story-telling elements across the provocations. Each provocation can be a singular entity for discussion and reflection as well as an element in a larger collective story that can combine several provocations.

3.1 Story-telling and role-playing to create new narratives

The *story-telling mechanics* is inspired by the dice used in RPGs, such as *Dungeons & Dragons* (D&D). Since our intention is to get participants to critically reflect upon past narratives to create new ones, the story-telling element of RPGs is an excellent metaphor for how we want participants to engage with each other and create new stories of the future. Polyhedral dice sets are a core element in most RPGs, where the die throw brings in probability and fate to the story-telling activity [11]. The DOREEN game is centered on an octahedron die. Dice have been a historical part of ceremonial behavior and rituals in many cultures and societies worldwide (Ibid). Dice rolling in D&D is used to generate scores for various dimensions of a character. Role-playing games typically make use of a combination of differently shaped dice: The *Dungeons & Dragons* dice set includes a set of d4 dice (with four sides), d6 (six sides), d8 (8 sides), d12 (12 sides), and d20 (20 sides). Rolling dice determines the *ability score* of characters or the numeric representation of their physical and mental attributes. Biased assumptions of gender

have been embedded in D&D over the years. Scholar Antero Garcia notes:

“One of the places where the choice of a character’s sex does make a difference is in physical ability (. . .) females have lower strength than males. In a system where you can be an elf, cast powerful spells and barter with dragons, the notion that women could be as strong—if not stronger—than men was too preposterous to be developed within the system.” [18] p.238

The design of DOREEN die is a classic octahedron dice used in RPGs, the so-called “d8” or 8-sided dice. Dice, and the statistical probability connected with their use within the rules of the game system, play an important part in the way the adventure unfolds – and in some cases the gender of a character might specifically affect dice rolls and the statistics connected with them. In early versions of D&D, for instance, a female character’s strength was determined with a roll of one d8 and one d6 (i.e., with a range from 2-14) – instead of three d6 (i.e., with a range of 2-18) as was used for male characters, restricting the range of the possible outcome [20]. The system of possibilities in the early days of D&D was back then more open for strange magical creatures than imaginary female characters. However, things have evolved and changed, with more recent editions of the game being edited and refined with stronger attention toward equity and inclusivity - the role of gender and other social identities is now featured in the D&D Player’s Handbook, stating:

“Characters are defined by much more than their race and class. They’re individuals with their own stories, interests, connections, and capabilities beyond those that class and race define. (. . .) You can play a male or female character without gaining any special benefits or hindrances. Think about how your character does or does not conform to the broader culture’s expectations of sex, gender, and sexual behavior” [27, p.121].

The RPGs landscape has recently seen an influx of independent, women-authored role-playing games like *Savage Sisters* [29] that push the boundaries even further, by centering the actions of warrior women as the main characters of the game – and that articulate queer and feminist approaches to collaborative storytelling in the handbook – not least by humorously defying well-established norms like changing the classic acronym for the storyteller, the GM or “game master”, into the “GrandMother”. DOREEN brings the same feminist approach to collaborative storytelling within institutional settings.

3.2 Multiplicity, possibility and intertextuality

The intertextual design of DOREEN reflects two numerical systems that are foundational to computing: The binary (0/1) and the 8 bits that form the basic unit of digital information: The byte. We designed an octahedron die not only to reference the classic d8 in D&D, but also to reference the 8-bit architecture in computing. Each side of the triangle that composes the dice, side 0 and side 1 – refers to the binary standard in computing. All signals in a computer have two values: 0 (which can be thought of as *off*, or

false) and 1 (*on* or *true*). So, a byte - the unit composed of 8 bits - represents 2 to the power of 8 different values: 256 values (0-255). Variations of early 8-bit processors are still common in embedded systems today, and the first commercial 8-bit processor, created in 1972, was the Intel 8008.

The *playfulness* of DOREEN linking to RPGs is in line with the idea that characters (people in computing) are much more than their race, gender, and class. With this playfulness, we want to reflect the experience of some of the students who created new and alternative narratives about computer science, and gender. The theatre plays became a place for the interviewees to be themselves, express their perspectives and experiment with different roles, defying dated assumptions and stereotypes – so we wanted the game-play of DOREEN to be a playful, exciting, and fun experience. Here the intertextual referencing to the Marvel *Unbeatable Squirrel Girl* also introduces not only a *girl-squirrel* computer science student character (aka Doreen Green, the computer science college student), but also her wit and humor which together with her power (e.g., superhuman strengths and agility) and abilities (e.g., heightened reflexes also called ‘squirrelgility’, and ability to communicate with squirrels) create unorthodox solutions to overcome barriers. We see the stories related to the revue in our empirical material as an expression of how through wit and humor women critically talked about their experiences of being in computing and created alternative narratives. The revue performances thus become a new form of language - a new superpower - which can communicate lived experiences allowing others to understand them from the perspective of those at the margins. Similarly, the DOREEN game is about providing a vocabulary while producing an experience where participants are empowered to collectively create new stories about future ambitions in computing, including strengths (superpowers) to find unorthodox ways (using wit and humor) to highlight and challenge barriers. We chose to weave in the intertextual reference to Squirrel Girl/Doreen Green also because with it we want to highlight the recent change in the traditionally male-dominated superhero industry. Mainstream superhero comics, just like RPGs, have historically had issues with stereotypical and unequal depictions of gender and race, but recent years have seen an increase in awareness of these problems. Some large companies like Marvel (now Disney-owned), have started working on improving the way they represent and depict gender, ethnicity and sexuality in their comics and movies, following the general trends of raised awareness of the importance of fictional characters as role models. Other examples besides Squirrel Girl could be the comparatively new Ms Marvel series, featuring a young Muslim girl in the lead role, or Captain Marvel.

DOREEN displays and reflects the limiting narratives and roles emerging from our data as well as the *creation of new Adventures* inspired by the new characters and roles created in the theatrical play in the Computer Science Revy. Additionally, DOREEN brings in reflections on the societal pressures of “*role modeling*” when embodying a marginalized gender identity in computing, which was described as a burden by some of the women interviewed – restricting them from the possibility of “just being oneself”. DOREEN translates the tension between the constraining and empowering dynamics afforded by roles (gender roles, “role modeling”, fictional creative roles etc.) – while drawing references to subcultures close

to computing which are changing to become more inclusive (D&D and the Marvel superhero industry).

3.3 DOREEN game, rules, tokens, and players

The purpose of DOREEN is to create ambitions for the future of computing, including ideals, strengths, and barriers. The game will be exhibited the first time during the NordiCHI 2022 conference in Aarhus, Denmark, and conference attendants will be invited to play together. The players start by selecting and assembling the octahedron die, selecting from the possible triangles with provocations. When the die is assembled, participants receive an *Adventure sheet*, which they will fill out together as a small group during the game. The purpose of the game is to collect three different experiences (provocations), by rolling the die and use these as the foundation to propose one ambition for the future of computing. For each provocation, the participants discuss the experience and brainstorm possible ideals without limitations for the future of computing including barriers and strengths. When all the three provocations are collected, the participants evaluate and examine their ambition with related ideal, strengths, and barriers - and use this material to formulate a statement for the future.

The DOREEN game includes 16 provocation triangles, 1 DOREEN octahedron die structure, and 1 DOREEN Adventure sheet. The provocation triangles are 16 equilaterals (16 cm) acrylic laser-cut triangles, each inscribed with selected and cropped quotes from our empirical material. The provocation triangles can be assembled and reconfigured in any way or form on a 3D-printed structure with the use of small magnets. The DOREEN Adventure Sheet is based upon the D&D characters sheets. On it, players document their engagement, and formulate their statements for the future of computing.

The DOREEN game rules are as follows:

- 1: Roll die; discuss provocation; formulate Ideal
- 2: Roll die; discuss provocation; formulate Barriers
- 3: Roll die; discuss provocation; formulate Strengths
- 4: Based upon the above, finish the statement collaboratively:

Our Ambitions for *the Future of Computing*. . .

We want people to create their own customized DOREEN games, thus we share all the digital fabrication schemes and templates freely available online on the www.femtech.dk website, including our provocations. However, we invite others to customize the DOREEN game by adjusting it to document and display their own experiences, as well as sharing the resulting Adventure sheet online - so that we can acknowledge problematic narratives and find ways to create new futures together. If we are to achieve equity, increase diversity, and further inclusion in computing - it is a collective task to create spaces and environment which foster equity for all.

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