Cassandra Rousseau
Student ID: 40177594
cass201001@gmail.com

Critical Reflection —

Textile Game Controllers: Exploring Affordances of E-Textile Techniques as Applied to Alternative Game Controllers

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Elio Bidinost

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Textile Game Controllers: Exploring Affordances of E-Textile Techniques as Applied to Alternative Game Controllers is a paper that describes remote workshops that covered e-textile techniques by making alternative game controllers. The purpose was to prioritize creative exploration within marginalized makers, allowing diversity, equity, and inclusion within the game-making field. The main research goal was to explore and elucidate the overlap between e-textiles and experimental game making. The workshops served as a research method on embodied experience. Giving marginalized communities space to express themselves reduce the inequalities. However, there are still a lot of issues within the video game field. The game community and industry poorly recognize women in the community, give few spaces to people of colour, and games are poorly accessible to people with disabilities.

The workshops served to give space to women, which are not acknowledged in the field. In the industry, only 24% of workers are female.[1] This low percentage is due to being poorly represented in the game industry and the cultural issues within the community. Many women workers and gamers live harassment. Female protagonists' characters in video games represent only 5% and are often objectified or hypersexualized.[2] The gaming experience shifts towards men (e.g., violence, sex, competition, etc.) This environment makes women feel underappreciated and unrecognized. Some measures have been applied within the community. Some universities such as *UCA* (i.e., *University for the Creative Arts*) have used a 60/40 students' ratio.[3] Some created inclusive courses about game design. Many groups exist to give space to marginalized groups and promote intersectional practices such as *Dames Making Games* or *Women in Games*.[4] Their goal is to raise awareness regarding gender discrimination in the gaming field. Maker groups helped raise feminism in critical design in craft practices. One of the game jam objectives was to provide domain expertise to participants within an equity-seeking community. The do-it-yourself approach of the game jam gives a diverse and equitable space in technology making.

[1] Tomoko Yokoi, "Female Gamers Are On The Rise. Can The Gaming Industry Catch Up?," *Forbes*, March 4, 2021, https://www.forbes.com/sites/tomokoyokoi/2021/03/04/female-gamers-are-on-the-rise-can-the-gaming-industry-catch-up/?sh=4058655af9fe.

[2] "Female Gamers."

[3] Becca Caddy, "'I was always told I was unusual': why so few women design video games," *The Guardian*, February 17, 2020, https://www.theguardian.com/education/2020/feb/17/i-was-always-told-i-was-unusual-why-so-few-women-design-video-games.

[4] "Female Gamers."

Giving space to people of colour was also a goal during this game jam due to their poor exposure in the field. Only 2% of professionals in the game industry in the U.S. are black people.[5] 4% of workers worldwide in the game industry are people of colour.[6] Some measure has been taken. The *Big Five in Five* campaign wants to boost Black employment to 5% in the next five years.[7] Companies like *Electronic Arts* inserted programs to employ more Black workers.[8] Intersectionality was vital during the game jam. Organizers wanted workshops to enable material development and share skills and domain knowledge across participants. It offers a way to consider sustainability in research outcomes. The involvement of numerous cultures shows the importance of inclusion in game making. Intersectionality allows developing better creations due to various perspectives.

Accessibility was a strong theme in this game jam due to poor consideration regarding disabled people. The game industry has difficulty understanding how to do appropriately accessible games. Accessibility does not depend just on the difficulty of the levels in the game. Accessible features should complement the game. These options should not remove anything from the gaming experience but help those with disabilities to appreciate it even more. Some measures have been taken. Multiple companies now hire accessibility consultants and developers to make their games playable for disabled people.[9] UI and UX get more and more adapted to disabled people, users can customize controls, workspace becomes more inclusive regarding disabled workers.[10] Alternative controllers made during game jam allowed removing established conventions in games and design. The material play approach used during the jam is central to physical experiences of making, haptic and multi-sensory feedback core to learning and developing e-textile and wearable technology projects. Organizers used play, in which this mechanism for transmission involves the public in social spaces to extend the research to a broader audience. During the jam, five workshops were offered, focusing on creating alternative game controllers using textile sensors and microcontrollers. Each workshop explored different topics, materials, methods, and game types. It served

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[5]Karen Toulon and Bloomberg, "Black workers find little opportunity in growing video game industry," *Fortune*, March 16, 2021, https://fortune.com/2021/03/16/video-game-industry-lacks-diversity/.

[6] Chella Ramanan," The video game industry has a diversity problem – but it can be fixed," *The Guardian*, March 15, 2017, https://www.theguardian.com/technology/2017/mar/15/video-game-industry-diversity-problem-women-non-white-people.
[7] "Black workers."
[8] "Black workers."

[9] Grant Stoner, "How accessibility consultants are building a more inclusive video game industry behind the scenes," *The Washington Post*, February 25, 2020, https://www.washingtonpost.com/video-games/2020/02/25/how-accessibility-consultants-are-building-more-inclusive-video-game-industry-behind-scenes/.

[10] "How accessibility."

as an opportunity for iterative development. Controllers produced were used to control existing games. The first workshop, *Introduction to Textile Game Controllers*, introduced a selection of materials and prototyping methods to gauge interest in topics for future workshops. The game jam introduced three sensing methods: capacitive sensing, digital switches, and analog sensors, all made with conductive textiles. The used methods were connecting e-textiles on *Makey Makey* (i.e., prototyping board creating *DIY* interfaces for games) and using *Arduino Micro* board to enable textiles switches to control browser-based games on a *USB*-connected laptop. The second workshop, *Body-Centric Game Controllers,* dived into creating game controllers using analog sensors. Sensors are made with conductive fabric and resistive plastic sheeting. The workshop designs pressure-sensitive textile buttons for specific body parts. The third workshop, *Wearable Game Controllers*, focused on a more complex implementation of digital switches, introducing the idea of *social switches*. A piece of conductive fabric on another person's body part will close the switch and make an electrical connection. The fourth workshop, *Stitch and Stuff: Making Embroidered Games,* focused on creating capacitive sensors using embroidering techniques with conductive thread. Took a hardware-only approach to make a textile game controller; the game does not rely on a screen-based device. The last workshop, *Fun with Felting*, used the same sensing technique (i.e., capacitive) with a different crafting technique - felting. These explorations are steps that lead the industry to a more accessible space. However, these solutions will not solve every disability.

The game jam created an inclusive space where marginalized communities could feel welcomed. The intersectionality between different genders, cultures, and realities brought unique visions to change the game industry's narrowed mindset. However, it will take more actions than equity-seeking workshops about alternative game controllers to engage more significant changes for the communities in this field.

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