



## ***INTER/her: An immersive journey inside the female body – Creative Processes, Reflections and Revelations***

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*INTER/her: Intimate Journey inside the Female Body* is an immersive installation and Virtual Reality artwork focussing on post-reproductive diseases that for women over 30 can often experience, including: endometriosis, fibroids, polyps, ovarian and other cysts, as well as more serious cervical, ovarian, uterine and endometrial cancers. The project is an intimate immersive exploration of the inner world of women's bodies and the reproductive diseases they can suffer. The focus of *INTER/her* is on female health intended to enable personal exploration, as a conversation starter, and as a community builder. This article discusses the creative methods, design process, and tools for making the multimodal interaction used in the *INTER/her* artwork, exploring their nature, value, and significance within the project, and what they implicate for future work and research in this area of art and design. It will discuss the making, expression and narrative elements used to represent, explore, and understand the emotional and bodily/sensorial experience designed for visitors, as well as the meaning making through metaphors used to represent different organs and ailments. It will cover the collaborative development of the team using various technologies and storytelling approaches guiding the making and communication during the 2nd lockdown of the COVID pandemic in the UK. This work was not initiated or made as a research project, but some of the outcomes have implications and potential impact on future virtual reality design and research, and hopefully policy changes for women's health.

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## Introduction and context

*INTER/her* focusses on the difficulties women face in diagnosis and treatment of the reproductive diseases they endure, motivated directly from my own experience of fighting (and winning) against ovarian cancer in 2016/17. This experience provided the personal imperative to make the artwork as a means to give back something meaningful to other women in the same circumstance. It is based on personal experience and my journey through the UK healthcare system, but also uses my art practice as the frame from which to communicate the experiences, emanating from inconsistent or lacking information, a male-focussed healthcare system, and varying medical support for women's health concerns. It is also inspired by the stories I heard from friends and family on their reproductive disease experiences and treatment, which were hidden or kept to themselves, due to the sense of stigma or resignation to this 'female burden', until the topic was raised.

The project was not initiated as a research project, but instead made purely as a socially engaged artwork, and thus, it began with no driving research question or research methodology, but was made in an instinctive and iterative process, in collaboration with other artist/designers brought into the project at different stages. However, my main motivations were from the questions: 'how can I design and create an artwork that addresses and makes more visible, both the reproductive diseases that women face, and the lack of timely diagnosis and/or appropriate treatment?' and; 'how can I find way to open the conversation with the general public, in an accessible but intimate way, through my own practice in digital arts?' and; 'how can I initiate self-education of women on their bodies through the work?.'

The organisation of this paper includes the motivation, inspirational knowledge domain, the design process of the full project with collaborators, development of the in linear interaction design process that unfolded to enable maximum for audience experience and engagement, it also includes discussion of the post exhibition feedback from the visitors, especially the engagement in the narrative, ease of use of the virtual reality headset, controllers and navigation, the comfort and experience of the haptic belt, and the observations from and of visitors during and after the experience, as well as patterns that I observed after 5 exhibitions of the work in different locations and settings.

## Theory &/In Practice

At the heart of *INTER/her* are the concerns of female mortality, and the survivalist instinct to cleanse the body, to heal it that women may feel. It positions the physical body as a site to examine the psychological and socially constructed and upheld issues

of womanhood and female identity. Themes that emerged for me and that drove the work include: the sense of self, body image, loss of body parts, sexuality, confusion, pain, lack of reliable information in a still male-dominated medical institutions, as well as body betrayal, negative thinking, anger and frustration of not being taken seriously or ignored, the festering of untreated conditions, along with feelings of mortality, instigated and manifested by the ailments.

Initially, the project used an overtly techno-feminist inspired lens from Xenofeminism and Cyberfeminism writing, but overtime and while developing the practical and aesthetic design, with the primarily female collaborators, the intellectual/academic feminist perspective fell away to become more intimate, empathic, with a sense of sisterhood or camaraderie emanating from the stories themselves; ideology melted to friendship and mutual support. All the women on the team had faced the same reproductive health issues explored in the piece itself, from polyps, fibroids and endometriosis to menopause and hormone replacement therapy (HRT), ongoing blood testing, biopsies, and pain due to polyps etc., all with a personal imperative and stake in the project. In the end, the key inspiration came from two key authors, Caroline Criado Perez [2] and Natalie Angier [1]. Perez focusses on the unequal consideration of women's bodies leading to the lack of data, and thus, accommodation for them in the world. She explains in her book *Invisible Women: Exposing Data Bias in a World Designed for Men* (2020), that the male body is the standard body in almost every context throughout the world, while the female body is considered the 'other', an aberration.

Excerpts used from Perez's book were on the way that the health care system fails to diagnose or support women in pain and disease, which were added to the script of the VR stories and journey. What stood out from her discoveries was that unless the perspective of the female body – 51% of the world's population – is changed by society and medical, educational and governmental institutions alike and no longer considered as 'other', but also becomes another standard, then the medical, political, and social ignorance will persist, and women will continue to suffer needlessly. As has been shown in the media in recent years, women's bodies have not been researched nearly enough, nor considered important enough for UK GP's to be required to spend more than a thirty-minute, optional study module studying them or their ailments (McCall and Channel 4, June 2021), which explains the continual misdiagnosis that women face, and in the 21st century, this is frankly shocking. Once we understand the female body better, and the positive affect of female hormones on the brain, skin, bones, heart and whole body throughout a woman's life, as well as other aspects of the female experience of pain and diseases, we can better address reproductive issues experienced by a range of

different bodies around the world. We need to focus on preventative health, rather than the medical and healthcare system's current dysfunctional and wasteful approach that is single focus, curative, reactive, and based solely on male bodies. A better future is one where women's bodies are equally as important to men's and receive equal research, education, and treatment to men.

Natalie Angier's book *WOMAN: An Intimate Geography* (1999, revised 2014) was used for the biological/anatomy descriptive dimension, but also to explore concerns of mortality, treatment, surgery, etc. Angier was discovered on my own bookshelf while I was at home between surgeries. I realised how perfect her writing was to help understand what was happening to me and other women and could be used to describe the female biological processes and organs, and how they change over our lifetimes. What her accessible, playful, poetic and yet explicit and anatomically correct passages brought were vivid visual descriptions that stimulate the imagination and educate at same time. All girls and women would benefit from reading Angier's book to better understand their bodies at different stages of life. Excerpts from the book were threaded into the narrative along with actual women's voices of their experiences, and some inspired the imagery in the VR world. A sample excerpt:

The fallopian tubes, those gorgeous pink sea pens, follow the drama with their feather-duster tips. As the follicles grow, the tubes brush over the surface of the ovaries, firmly, insistently, seeking clues...The tubes are extraordinarily flexible. They are like the arms of an octopus, or vacuum cleaner hoses ... in a woman with endometriosis, for example, when one of her tubes is lashed down by a tangle of stray uterine tissues and cannot sample its seedpod. The opposite tube take up the task of monitoring and snuffling the surface of both ovaries.

(Angier, 2014: 230).

## **Methods and Design Process**

Early on, I found the creative technologist and media artist Maf'J Alvarez to explore the best way to design and communicate the stories of women with an immersive experience. The initial stage of the project entailed writing a concept underpinned by current and relevant knowledge, develop a working process with Alvarez, put out a call for stories, research women's stories on online forums, interview women who answered the call, obtain consent to use their stories, record the stories professionally, develop a script and develop the interaction design plan with Alvarez, start working on prototypes with her, then acquire funding for the next stage. Once funding was secured the next stage was to hire a few more team members to help develop the full project

in virtual reality, including the 3D design, haptic belt electronics design, have the tent designed and manufactured, purchase its furnishings, and develop the presentation plan for exhibitions.

The final work was developed in two stages: pre-production and prototyping in October 2019 to July 2020, and production and exhibition from October 2020 to June 2021. Alvarez and I started working together on a prototype, funded by University for the Creative Arts (UCA), this enabled me to perform the fundamental, primary research and development, to create the story/narrative/script, the interaction design, and other pre-production elements, to record some of the stories with women, and to conduct a form rapid prototyping in the widely available virtual reality app, VRChat. However, all work was done on a part-time basis due to the busy schedules of everyone on the team in both phases, and the limitations of the funding to undertake the actual production, although Alvarez was invested in the topic herself and put a lot of extra work into it for free.

The design process started with brainstorming the aesthetics and technical dimensions, and I showed Alvarez sketches and interaction maps that I had made and talking her through the issues. There were many discussions about the internal reproductive organs, and we viewed a lot of medical images; I ordered a medical model for my desk, but I decided that I did not wish to visualise actual diseases, but instead use metaphorical objects to representations of diseases. The technical options and possibilities using the software Unity 3D (the main game development software used), and the 3D modelling tools for designing the assets, as well as to create the prototype. Initially, I envisioned that it should be completely dark in the internal journey and completely led by the women's voices and stories and I searched for images of dark tunnels to visualise the vaginal canal and other tight spaces in the body. Alvarez guided me through a prototype she made in Unity 3D and loaded into VRChat, which she made for another project, and then she made a similar one for *INTER/her*, so that we could both move around inside the virtual representations of the organs, to envision and discuss what could be done in the final work, what type of interactions to include, what users/visitors could do to interact within and with the environment, and how to use the controllers with their bodies inside the virtual space. The VRChat prototype helped to shape the thinking about ways of making, the methods to reframe the problems, and enabled me to 'see from the inside' better. We then developed a solid plan for the final production stage.

During this first stage, I also began collecting women's stories to help shape the narrative before the full production stage started. One difficulty was getting women to contribute personal stories: many were interested and wanted to contribute but when it

came down to arranging recording the stories, they did not follow through, apart from a few could be voice-actor recorded. The stories were initially collected via social media calls, and some volunteered theirs once they found out about the project, and even serendipitously. The intention was to see those who contributed their story in person and record their voices. However, when the pandemic hit early in 2020, a new plan was implemented: to use a combination of real stories and recorded passages taken from the Perez and Angier books, especially Angier, who has a poetic and accessible way of writing about internal female body parts and bodily processes. Some of the voice recordings that were sent in were great in terms of content, but their sound quality was not high enough to use, and the stories were at times too meandering to be usable – understandably as these women had lived through harrowing experiences and these should not merely become a sound bite if I could not do them justice. Even my own ovarian cancer story had to be severely edited, and nearly tossed for being too long, and finally I used a portion of the end narrative about the menopause and hysterectomy. I recorded over ten of these in the end and added a few of my own stories, to add my personal element back again into the project.

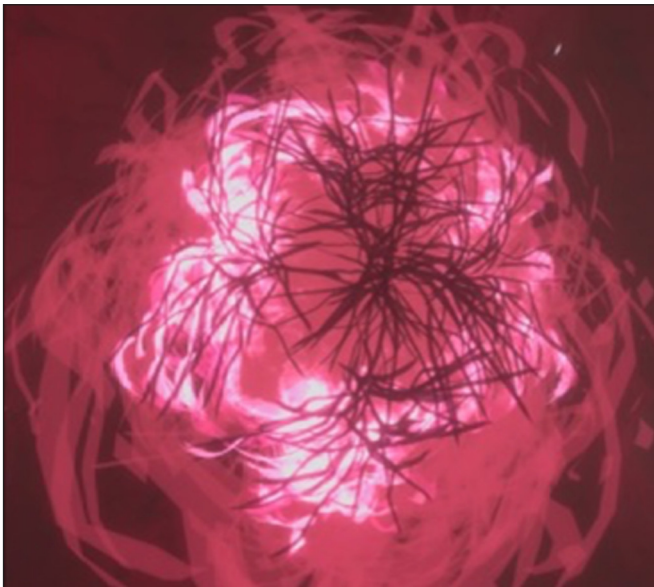
With the success of further funding from the Arts Council England Lottery Funding, which came in September 2020, I was then able to build a larger production team to take the project into full production mode, then to the exhibition stage. With the partnership of Access Studios curator, Jake Harris, to exhibit it in Sheffield, as well as the additional support from UCA to exhibit it in one of its galleries in spring 2021, there was a clear path to completion, and further funding support for exhibition and transport costs in summer 2021 came from UCA again.

In the full production stage that began in October 2020 until March 2021, the practical interaction design process involved determining the order of the stories in the Unity 3D timeline and in the virtual space, to develop the ‘journey’ through the reproductive system and what the visitors would see and do in the virtual experience. One characteristic of the project is that it was designed by a primarily female team of artists and designers, the production done entirely almost remotely, which was quite challenging, using all available tools for design and online collaboration during COVID lockdowns, including: Blender 3D, Google’s Tiltbrush, Unity 3D, Oculus Quest 2 (now Meta Quest 2), Arduino programming environment, Zoom, GitHub, and Royal Mail (for testing the corset). At the beginning of the autumn 2020, Alvarez and I were meeting once a week in Brighton at a mixed reality incubation space, to plan and start the full production and to design a lot of the structural elements; we even met with Burge there once or twice as well. I went into UCA Farnham campus to record the voiceovers with actors in autumn 2020. However, due to the pandemic, Sarah Büttner, a former MA



student of mine with health concerns, preferred to stay mostly remote, and British sound artist Kat Austen was/is based in Berlin and could not meet us in person in UK even once. So, we worked on most of the production online, having team meetings on Zoom, and often full day working sessions on Zoom, sharing the Unity screens with each other, problem-solving and designing together, sometimes with the full team, but mostly the others worked offline only presenting their work when ready. While Alvarez and I would work together on Zoom, Unity, and Blender together every week of production from January to April 2021. All used GitHub to share files to the evolving Unity build, so we were all working on the same file together remotely. Alvarez and I managed to complete the last phase, in person in the space in Brighton, mostly intensively when restrictions started to lift, between April to June 2021.

Alvarez' style of collaboration with other women is very empowering by intention. She tries to teach and enable her female collaborators to develop as many technical skills as they can and be able to design the work as much as they can without her. We were joined by other team members for the full production from November 2020 to January 2021 for specific aspects of the project such as the 3D environments and story objects, the design of the housing for the haptics/electronics, and the sound design. Alvarez built the scaffolding of the body environments in Blender 3D and Unity 3D, while Büttner designed the flower and plant assets in TiltBrush, and then Alvarez enabled me to go into Unity 'decorate' and edit all the visual and audio objects in the VR environments. By the end of the project, I was designing a great deal of it in Unity (with no formal training).



**Figure 1:** Early interior artwork for inside the VR experience © January 2021 Sarah Büttner for INTER/her.

Sadly, not all of Büttner's beautiful Tiltbrush designs could be used as they were too high resolution for the Quest 2 which is essentially a phone in a casing, and we had to radically reduce the poly count and adjust the story objects so that the whole project wouldn't slow down the framerate and make the piece less accessible/viewable.

The imagery is of abstract organic objects like flowers [Figure 1], plants, and fungi, were made in Tiltbrush by Büttner, following a mapping of all the

stories, each to represent the different diseases women can suffer from, which grow and mutate in the reproductive system. As each story is told, the haptic corset is triggered through WiFi, and in a different vibration/pulse pattern, in a different location on the belt/lower abdomen, where visitors can turn around 360 degrees while held in place, not able to move forward until the story is complete, and then can move again once heartbeat and breath begin again.

Coming from both a science and fashion design background, Bushra Burge was invited to join the team to design the vibration belts/haptic corsets [Figure 2 below]. She chose to prototype the interaction design based on the discussions we had about what sensations/vibrations should take place on which parts of the body and mapped then to the Arduino programming of the microcontroller and the video boards around the belt. She did mood boards for the visual design of the corset but also designing it as a housing for the electronics to enable them to be put on and around many different body types: to be able to tighten for smaller people and expand for larger ones. She followed the organic and natural vegetation ideas we were working with on the interior VR space and started using sea creatures as the visual metaphor for it. Once Sarah Büttner had designed the 3D assets in Google's Tiltbrush, Burge took one of the story objects' images as the visual basis to make a digital print on surface the faux leather and the chiffon fabric used for the corset housing. Burge then made and dyed some felt balls to sew on the outside, to metaphorically represent internal growths. The construction of housing of the haptic corsets/vibration belts, was done so that the electronics could be removed for repair etc, and not totally integrated into the garments. However, it was not ideal for the long term, as it exposes the electronics, and the nature of the free-floating wires means that with every visitor there is a risk



**Figure 2:** Haptic corset with vibrating actuators in the belt, designed by Bushra Burge © March 2021 designer for INTER/her.

of wires being pulled on and then damaged, as has happened in the long run with each of the haptic belts, now after 300 users who have worn them. However, when the electronics have been damaged, we still did put the belts on people, just to enable them to feel the sensation of having something holding them around the lower abdomen during the experience, which many appreciated.



The sound design was created by Austen, normally a renowned sound artist in her own right, specialising in climate crisis sound art, film scores, and installation artworks on the topic. I discussed the project with her and because the topic was close to her heart due to her sister's long suffering with endometriosis, and so she was happy to work on it. The sound design stemmed from the emphasis of the women's voices and their own references, and bespoke ambient sound effects were designed for each story topic, the object/organ it accompanied, following our mappings [Figure 3 below] of the stories to locations on the body, to create the most emotive soundscapes for each story object and between them, under and supporting the main narrative path: to emphasise the message and emotion through the voices are heard.







Story	Story Name/Topic	Top	Bottom	Side	Haptics	Mode	Visual Object	Sound Effects	Timing (secs)	Ambient Music	Object
s1	Tent/ Intro	max	max	max	test - all on	static	Tent	Heartrate, breathing	104.5	none	Tent/ none
						moving	vaginal canal/tunnel	Heartrate, breathing		Running water in tunnel	
s2	Mary 1 / Cervical Cancer		fade quick / 0-max		above pubic bone, intense fast intermittent vibration	static	white flowers on floor	none	79.1	strings: cello & dbl bass	
						moving	entering and in the uterus	Heartrate, breathing		echoy space	
s3	Annelies / Fibroids/ Uterus		fade slow / brightness medium = 70		below belly button (above the last) - less intense, solid deep vibration (like low throbbing bass in music)	static	big purple pulsating flower in uterus	none	93.8	piano & piccolo	
						moving	uterus environment	Heartrate, breathing		echoy space	
s4	Polyps				near left fallopian tube	static	hanging/droopy bright pink flower	none	78.1	bass guitar and cymbals	
						moving	uterus environment	Heartrate, breathing			
s5	Fallopian Tube				2 inches either outside belly button / inside hip bone, light intermittent vibration - maybe "sicky"	moving through tube	the actually feathery tubes at the end of the Fallopian Tubes	none	78.1	snuffling and contrabass	
						moving	Fallopian tube tunnel	Heartrate, breathing		small sounds	
s6	Samantha = Endo & Ovarian				just inside the hip bone - very light and very slow intermittent vibration (almost imperceptible)	static	the ovary / inside	none	163.9	piano & brass	
						moving	entering and in the ovary	Heartrate, breathing		?	
s7	Rachel / Endometriosis				back and sides - vibration pattern - sharp and intense but also random	moving slowly through cavity	endometriosis flowers (1st one Sarah made), outside ovary and uterus	none	132.3	Voice	
	none				none	moving	outside the ovary in abdominal cavity	Heartrate, breathing		footfall and surgery sounds	
s8	Camille/ Menopause & Hysterectomy				whole front (all vibe boards/electronics buzzing) on and vibrating	not moving	the white void/ then black	metals utensil and low murmur	105.1	dropping & spinning coins / wind in grasses, bass guitar	

Figure 3: Mapping of the interaction design between modalities © May 2021 C Baker.

Alvarez and I explored which controllers for visitors to use (left, right or both or some other haptic controller), which buttons would be used on the controllers, if visitors would sit or stand or even crawl, what narrative or other technique should be used to trigger the stories, and thus, the haptic vibration (technically and metaphorically). We mapped the imagery [Figure 3], the stories, the sound effects, the music, the vibe board locations in the belt and subsequently on the body, the vibration patterns and all to each other to have a coherent narrative across all media and modalities. The final story versions, coupled with bespoke music, sound design, and sound effects to accompany each story, and the spatial journey determined by the rough the anatomical positioning of them in the locations where each condition would be, created a natural story arc.

The physical tent [Figure 4 below] was initially intended to be a geodesic dome or similar, but after much research and thinking both thematically and practically, I decided that a bespoke inflatable tent would be the best option to represent the womb.

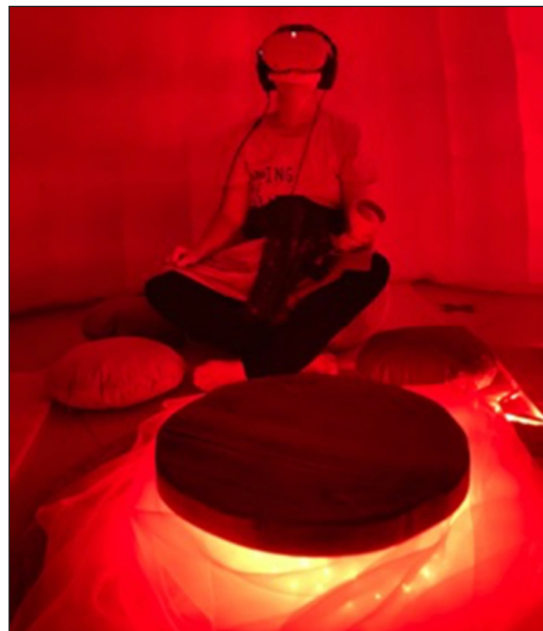
Initially, I wanted more realistic body organ colours such as peach and beige, but the aesthetics of these colours were not appealing and so I went with more stereotyped colours. The initial thought was to use a manufacturer in China to save money, but due to the pandemic I decide to use a British company, which was much more expensive, but the service and support was excellent, and I was able to co-design it with them.



**Figure 4:** The vaginal tent exhibiting in the Brewery Tap Project Space Gallery, Folkestone, UK © June 2021 Camille Baker.

### Interaction Design for Audience Experience

For *INTER/her*, the sensory and emotional experience transitions from the outside in, within a physical tent space [Figure 5 below], into virtual tent space was considered and planned from the start. It features a guiding audio soundscape of the voices and stories, told in the voices of real women recounting their experiences of disease and pain. It comes with an accompanying wearable vibration belt or 'haptic corset', which provides a visceral sensation on the lower abdomen and sides below the ribs, where the various diseases occur inside the body, triggered by the virtual objects in the story that represent the different reproductive conditions, amplifying the intimate, moving experience.



**Figure 5:** Visitor with 'haptic corset' inside the 'sitting womb' for the audience testing © May 30<sup>th</sup> 2021, Camille Baker.

The 'staging' of the experience is essential:

- 1) each is greeted, their coats and bags stowed safely so that they can focus (if possible, they should also stop their phones too, although several like to take picture inside the red glow of the tent,
- 2) each are shown how to use the headsets and controllers (although many often forget once inside the tent getting started and must be reminded or guided),
- 3) they are invited to take their shoes off and enter the tent to find a comfortable beanbag chair,
- 4) each are asked to focus their view within the headset and adjust their view and then I often have to double check the WIFI is connected, and the experience is reset to the start for them before giving them the controller to start.

Participants are dressed in the haptic corset, which are embedded with vibration motors (actuators) for people to feel different sensations on the lower abdomen while listening to the stories/voices. The womb-shaped tent has a vulva-shaped opening [Figure 4 above] and can hold up to three women/visitors to sit on red beanbag chairs inside, with the headset on, with the haptic corset in place, to feel the vibration sensations on their lower abdomen, triggered by related stories within the interior virtual body space. For example, the first story is about cervical cancers, which is mapped to a vibe board located above the pubic bone in corset/belt, to indicate its location in body [Figure 2 above], providing a slow pulsing pattern. Cervical cancer is a condition that is sometimes not easily detected by women but is often fatal (and now preventable with the HPV vaccine in adolescence), so we tried to emulate the vibe patterns to the diseases as best we could.

Keeping visitors from moving between stories was a decision made to keep the visitor's attention on the content of the story, before allowing them to move on to the next one. The sound of the breath and heartbeat, in between stories, guides visitors and moves them to the next story, and helps them to realise that the story is over, they are told this in the briefing and that they keep moving through the environment until they are instructed to take the headset off.

Each visitor is debriefed afterward to ensure that they are alright with what they experienced, and to enable them to discuss their thoughts and reactions, as well as to give them a chance to provide their feedback. The exhibition is accompanied by female health information and health support leaflets from women's health charities, to take away, inform and support visitors to reflect on their own bodies, ailments or that of their partners, daughters, sisters, or mothers, and seek help if needed.

## Testing and Iteration

The deadline for the testing and first exhibition at UCA Farnham was delayed to the summer 2021 due to the pandemic and moved elsewhere. This was a positive outcome as it gave us an extra two months to perfect the VR build and wireless connection to the haptic corset.

I was able to use a yoga/Kung Fu studio to set up the bespoke (5m sq) tent for the first time and test the whole experience on May 30th. I organised and conducted the audience testing day with the eight with colleagues and critical friends as participants successfully, with extremely positive and helpful feedback. Technical issues that were found from the visitor testing included the need to adjust the controllers to make it easier for visitors to look around 360 degrees, that we needed to brief people better on how to move in the virtual space, and tell them when they can move (between stories) when they hear the breathing and heartbeat sounds, and not to panic when they can't move forward during stories, and which controller buttons do what. We also learned that there needed to be instruction to 'move forward' on the title screen, so visitors know how to initiate the loading screen and get started. This was when we learned that the haptic corset electronics were not operating reliably or vibrating strongly enough to be felt, and not all working all the time, so they needed to be rebuilt – all important interaction issues. Thus, I had to have the electronics completely rebuilt before first exhibition three weeks later opening on June 23<sup>rd</sup>, 2021.

The UCA exhibition had been moved to the end of June, to Folkestone at the Brewery Tap Project Space Gallery due to the pandemic, with strict COVID Risk Assessment measures in place. Access Space Network also had trouble resulting from the pandemic; after we made the project partnership, they had had to furlough staff and were unexpectedly evicted from their space of fifteen years, so they were seeking a new space for the exhibition. This was initially delayed until July 2021 (from the original May), and then it was pushed again to September 2021, when they found temporary space for the exhibition and to fulfil the Arts Council funding requirements.

## Exhibitions and Audience Observations

The artistic aim of *INTER/her* was to start the conversation on women's unspoken reproductive health experiences with women themselves but also the healthcare systems and policy makers, to encourage sharing, inspire camaraderie, and potentially have women themselves instigate change in the system directly or indirectly. For women to demand better treatment, education, and policy changes for better GP training and diagnosis, to pressure the governments(s) to fund much more extensive research on reproductive health issues. The primary audience for *INTER/her* has been women of all

ages (including trans men), male family members, and male friends and partners who support them. The aim is to help them better understand their bodies, to push their health providers to be more educated and knowledgeable to better diagnose them. The secondary audience is health organisations or representatives themselves, to realise that more work needs to be done to understand and treat women in a more timely and holistic manner and put it into immediate practice.

I have since learned from exhibiting *INTER/her* is that the piece has the effect of being very moving emotionally for visitors especially men (the feedback is recorded on video and in a handwritten guest book or in photos available on the project website). Most from both groups reported being emotionally affected, but also felt aesthetically stimulated by the interpretive virtual spaces representing or gesturing toward the actual body parts and locations in the body. The visitor experience feedback gathered, included long detailed comments about the work being very strong, eye-opening, educational, and important for those who experienced it. Some cried, many confided their own stories and things they likely have told few others, as the piece gave them permission to share these confidences. For women, it is often emotionally and physically triggering, reconnecting them to their own experiences or that of their female peers/family, and most have had or have many of the conditions portrayed. Many are enraged that they or other women's very real pain is often ignored, minimised, or treated in a cavalier manner, told to 'just get rid of it all'.

For men, it is a connection (empathically) to the female body that they may not (often not) know is in pain or the pain is minimised (they know even less than women, who often don't really know about their own bodies), it is a chance to experience something (not as painfully) and connect emotionally with female physicality viscerally and more directly than through text or audio/visual, or voice alone can convey. The men who have experienced and have reported that they were very affected, feeling that they were so ignorant, being receptive after the experience to the message that women need to be listened to when it comes their bodies, pain, and conditions. Men stated that they were enlightened to the experiences of women in their lives who are suffering, because they had become immersed inside the emotional and visual representations of the internal body and become more physically alerted to the areas of pain and discomfort women face, via the corset vibrations. Most said that they now understand their partners, daughters, sisters, and mothers better afterward and were deeply moved by the experience.

The one trans man who experienced it said they could relate to the stories and was emotionally triggered to their own experiences with the healthcare system and their own gender dysphoria. They told me that they felt the experience was both familiar



and difficult as well, as it presents a CIS focussed perspective (CIS refers to those who identify with the gender of the biological sex they were assigned at birth), but they understood that for their own voice to be heard and valued that CIS women needed to make progress in being heard in tandem with theirs, since they felt even more ignored and marginalised. This was very eye-opening.

Visitors have included: psychologists, sexual health educators, medical students, media or other artists, curators, and a couple health VR makers curious about how the design choices were, as well as the 'general public'. Those in health and sex-education have said that they felt this should be available to young women in schools and in university campuses, to help them better understand their bodies, but that all women (and trans men with uteruses), would benefit (and their make partners/sons, etc), as many visitors have said that they felt these concerns are stigmatised and that women often feel quite alone in their experiences when they are going through them (especially women of colour who feel further ignored), so this could normalise it in society.

The tent clearly is essential for the transition from the real to the virtual world and back, and creates a sense of intimacy, safety, support (such as visitors not feeling like they might fall or bump into the RL wall or chair or something). People have often stated that the tent is very inviting, soothing, and without the VR, they could stay in there all day – almost like its own attraction. The VR journey itself was controlled so that visitors would not get lost in the environment or 'walk through virtual walls' (although that is a possibility, if they are moving opposite the way from where they are facing, so I warn them about that in advance) or miss something.

The biggest impact that I have witnessed, is that once visitors come out of the tent, almost all have said that they were moved or deeply affected by the stories, many have divulged very personal experiences or feelings of their own to me that have broken my heart. Some have said it's the best VR experience that they have tried. No one has been negative about the project. Some have said they wanted to corset to be more painful (mostly empathic men) or others said they were not really affected by the corset – this was very few, but most said the corset really helped them to connect back to their bodies in ways that other VR does not. Most had not experienced VR before and were now more likely to try others.

## **Outcomes & Conclusions**

The observations of and from the exhibitions in various locations and visitors from around the UK from May 30th to April 5, 2022, in receiving and experiencing the work have been overwhelmingly positive: as an artwork, a technological experience, and as a feminist conversation starter on reproductive health failings in the larger medical



community, and societal view of the female body – it’s a good time for this. I have not had one visitor yet say, ‘that was not for me’ or ‘didn’t like this’, so it is more a question how to exhibit it in more places, and eventually distributing it online (however it is best experienced in the installation form). Men, in particular, have had a very strong emotional reaction to the stories of women’s experiences. The more people who try it out, the more impact it will have.

What makes *INTER/her* unique? The connection back to the body while the evocative stories enact the personal realities vividly, through the visual representations in the VR, but by embedding the sensory engagement in a different, unexpected place on the body – in contrast with the typical eyes, ears, and hands – visitors can make the link back to themselves and the subject matter. Haptics connect visitors back to their bodies, stimulating empathy, more effectively than with visuals and sounds alone was an assumption confirmed. What the haptic belt enables is a mind–body connection within VR reaching back to the real physical body and based on their feedback, it helped the visitors with little knowledge of their bodies, to understand better. It also enables men to be more empathic women’s experiences. *INTER/her* may gain more traction and interest since there’s been more media attention and more education starting to be available in workplaces and schools on it, and with more openness about endometriosis starting to appear in the media, especially after the Davina McCall [3] documentaries on Channel 4 on Menopause in the last two years.

After six physical exhibitions, two conference demos, and three online/virtual exhibitions, and one film I made for a film series for the Barbican in 2022 on the project, what has become clear from the visitors’ feedback is that the multimodal component of project must be experienced together. The experience is not complete without the vibration belt/haptic corset connecting the visuals and stories with the physical body, with the sense of safety and emotional support, which would be missing without the ‘sitting womb’ tent environment, in which many confess to wishing that they could spend the whole day inside. It’s a 3-part experience that would be less without each other.

*INTER/her* still has some way to go to reach the majority of women in the UK (let alone the world) and to change the societal conversation and government healthcare policies. However, I was moved by conversations with visitors to write an (unsuccessful) government petition for UK parliament discuss and mandate new policies on GP training, education for women and girls and more research, I will try again or another way.

Since summer 2021, *INTER/her* has had some media exposure especially in 2021 (Huffington Post, BBC Sheffield, Art & Science blog in Canada, and NowThen Magazine Sheffield, Scottish TV and The Courier Dundee). The project was shortlisted by the prestigious Art & Technology award, the Lumen Prize 2021 in the 3D/interactive Category

<https://www.lumenprize.com/2021-3d/interactive-shortlist>, which brings other further opportunities. It has been part of the *London EVA Conference*, *Ars Electronica's* UK 'Garden' (online) 2021, *Brighton Digital Festival 2021*, *NeOn Festival 2021* in Dundee, Scotland; in Toronto at Ontario College of Art & Design University for the *game:play lab* Dec 2–7<sup>th</sup>, 2021; and then again for the University of Toronto and University of York collaboration, for the *Technologies of Care* project as part of the ArtSci Salon, at the Women's Library from April 7–28<sup>th</sup>, 2022; at *The Extended Senses Symposium and Exhibition*, in the Stephen Lawrence Gallery, University of Greenwich, London Sept 8–10<sup>th</sup>, 2022; and will be showing next at the *Peckham Digital Festival* in February 2023 (first time in London), and for the Margate's *Power of Women (PoW!) Festival* in March 2023.

This work has and will continue to lead to more opportunities to exhibit it and to develop related new works using haptics with virtual reality connection for more embodied, integrated immersive storytelling development. Health researchers have contacted me to explore collaboration and wishing to find new ways to tell medical stories to the public. There is a rich future of possibilities, both artistically and academically, in developing critical, affecting embodied experiences, and spatialised expanded reality storytelling and to learn and develop new techniques for immersive multimodal narrative experiences. I will ride the *INTER/her* journey out for some time and the subject matter is important not only to me, but many other women and feel it is critical to shift things for women and their relationships to their bodies, and how the medical establishment and society treats us/them.

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### Credits

Camille Baker – Artist/Artistic Director

Maf’j Alvarez – Interaction /Unity 3D Designer

Sarah Büttner – Tilt Brush and 3D environment artist

Bushra Burge – Haptic Corset Interaction /Fashion Designer

Kat Austen – Soundtrack Design

Andy Baker – Additional Unity3D programming

Paul Hayes – Haptic Corset Electronics Construction

### Media coverage

**Art The Science** (June 18, 2021) by Sara Truvert, *INTER/her Breaks The Silence On Female Reproductive Disease & Pain* <https://artthescience.com/magazine/2021/06/18/features-inter-her-by-camille-baker/> (Accessed November 22, 2021)

**BBC Sheffield** a live interview with Becky Measures (live on September 12th at 13:15) here (*audio recording will be posted on my website soon*)

**Dundee Courier** (November 11, 2021) *\*behind a paywall* <https://www.thecourier.co.uk/fp/entertainment/2730651/video-whats-the-pink-igloo-in-dundees-overgate/> (Accessed November 22, 2021)

**Promotional interview with the curator of the Access Space** <https://access-space.org/portfolio/inter-her-a-multi-sensory-immersive-art-installation-that-takes-you-inside-the-womb/>

**Scottish TV** (November 10, 2021) on NEon Festival <https://www.facebook.com/799233017/videos/886188128736399/> (Accessed November 22, 2021)

**The Huffington Post** (June 22, 2021), by Rachel Moss *Why Do Women Still Have To Fight For Answers About Their Health?* [https://www.huffingtonpost.co.uk/entry/this-artist-and-ovarian-cancer-survivor-wants-doctors-to-care-more-about-womens-health\\_uk\\_60d08b2ae4b02e04e28f03de](https://www.huffingtonpost.co.uk/entry/this-artist-and-ovarian-cancer-survivor-wants-doctors-to-care-more-about-womens-health_uk_60d08b2ae4b02e04e28f03de) (Accessed November 22, 2021)

### Exhibitions

**Access Space Studios**, Sheffield – Exhibition at the Food Hall (across from Site Gallery), September 15-October 8th, 2021 <https://access-space.org/>

**Ars Electronica 2021** 8th – 12th September 2021. UCA Artistic Presentation for the UK Garden *'In The Invisible Garden* – 10th September, 5-6pm CET <https://ars.electronica.art/newdigitaldeal/en/uca-artistic-presentation/> plus *Art in Flux: Reclaimed* – virtual exhibition relaunch for Ars Electronica Sept 8–12<sup>th</sup>

**Art in Flux: Reclaimed** – virtual exhibition relaunch at [Kensington & Chelsea Art Week](#), June 24th–July 4th 2021. See the virtual exhibition via the button below.

**Brighton Digital Festival**, Installation at the Gallery Lock In Brighton and Hove, Sussex, November 3rd -7th, 2021 <https://brightondigitalfestival.org.uk/events/inter-her-immersive-installation>

**EVA Conference** – Artist Demo Paper and exhibition demo, July 9<sup>th</sup> in London (plus Keynote Speaker on STARTS project) <https://www.youtube.com/watch?v=hyxj03ulZAO>

**game: play lab**, hosted by Ontario College of Art and Design University (OCADU) and the University of Toronto's **ArtSci Salon** – scaled down version with artists talk, Toronto, Canada, December 2nd–8<sup>th</sup> 2021

**National Gallery X** Showcase for *Art in Flux: Reclaimed* virtual exhibition March 30<sup>th</sup> to April 30<sup>th</sup> <https://www.artinfluxlondon.com/reclaimed-exhibition.html>

**NEoN Digital Arts Festival, Wired Women\*** theme, Overgate Shopping Centre, Dundee, November 10th- 13, 2021 <https://neondigitalarts.com/event/inter-her/>

**Peckham Digital Festival**, Eagle Wharf, 42 Bonar, Peckham, London February, 2 5th, 2023 [https://www.peckhamdigital.org/artists/2023/camille\\_baker/](https://www.peckhamdigital.org/artists/2023/camille_baker/)

**Technologies of Care at University of Toronto and University of York's ArtSci Salon**, co-hosting the exhibition, April 7–28, 2022. Exhibition details here <https://artscisalon.com/who-cares/camille-baker/>

**The Brewery Tap**, UCA Project Space, Folkestone – exhibition June 22nd to July 6<sup>th</sup>. 2021, <https://www.uca.ac.uk/galleries/brewery-tap/> and <https://mafineartcanterbury.com/archive/brewery-tap-exhibitions/>

**The Extended Senses Symposium and Exhibition**, Stephen Lawrence Gallery, University of Greenwich, London, Sept 8–10th, 2022. <https://www.extendedsenses22.co.uk/team-4-2>

**University for the Creative Arts**, Film Media and Performing Arts Doctoral lunchtime talk May 26, 2021

### Author Information

Professor Camille Baker is an artist-performer/researcher/curator in various art forms: immersive experiences, participatory performance and interactive art, mobile media art, fashion tech and e-textiles, responsive interfaces and environments, and emerging media curating. Maker of participatory performance and immersive artwork, Baker develops methods to explore expressive non-verbal modes of communication, extended embodiment and presence in mixed reality and interactive art contexts, using XR, haptics/e-textiles and mobile media. She is fascinated with all things emotional, embodied, felt, sensed, the visceral, physical, and relational.

Baker is Senior Tutor for Digital Direction and Professor in Interactive and Immersive Arts at the Royal College of Art, London, UK. Her 2018 Routledge, Taylor & Francis book *New Directions in Mobile Media and Performance* showcases exciting artists in this space. Baker also has been Principal Investigator for several EU funded Arts and Technology project for Brunel University and the University of the Creative Arts from 2012–2021.

### Competing Interests

The author has no competing interests to declare.

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### References

**Angier, N.** 2014 *WOMAN: An Intimate Geography*. Boston: Houghton MifflinHarcourt.

**McCall, D.** June 2021 *Menopause* documentary, Channel 4 [<https://www.channel4.com/programmes/davina-mccall-sex-myths-and-the-menopause> last accessed November 22, 2021].

**Perez, C.C.** 2019 *Invisible Women: Exposing Data Bias in a World Designed for Men*. London: Chatto & Windus.

