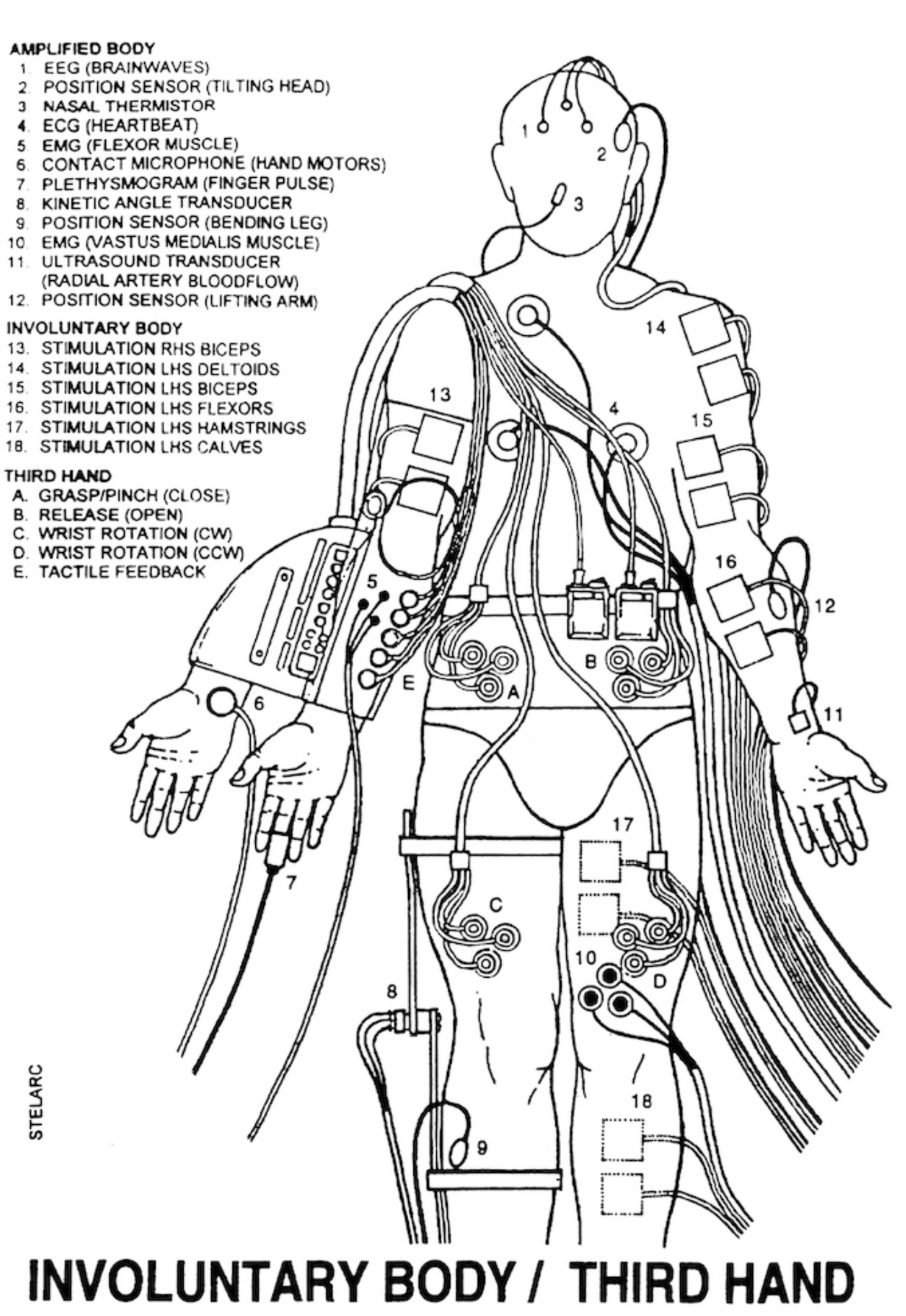
AAVS Melbourne _ Unit 1
Anthropomorphic Machines

THE UNIVERSITY OF MELBOURNE

Melbourne
School of Design
Faculty of Architecture,
Building and Planning

There is no architecture without action, no architecture without events, no architecture



without program. By extension, there is no architecture without violence.

Bernard Tschumi, 1996

Unit 1 set out to question technology and its implication on architectural space and the body. In our COVID19, BLM, and Climate Emergency context, we ask: What is our body's relationship with machines?

Under the agenda of anthropomorphic machines, the studio will run two parallel design briefs: Swarm Responsive Tensegrity and Seclusion & Comfort. Students are asked to choose one of the brief to work with during the two-weeks Workshop. Both briefs explore the body or bodies relationship with technology. Swarm Responsive Tensegrity exerts a direct interaction between the body and the machine through computer visioning. Seclusion & Comfort attempts to abstract and isolate the body into a set of physical and virtual relationships that we can describe as 'comfort' - can simple design criteria such as 'comfort' be quantified?

The design briefs are conducted through a shared design methodology – designing through making and testing. Fabrication and testing in physical and virtual environment enable the designer and the body to test and experience the effect. Here, our approach is performance based - performance not just in the functional sense but performance in the very realm of the body and its interaction with space and objects. The process, in turns, informed the design through developing incremental tacit knowledge.

This unit will take place at the Melbourne School of Design and the Science Gallery. Student undertaking the unit will need to have some basic Rhino 3D and Grasshopper skills. Student will choose to work on one of the brief only.

Delivery Mode:
On Campus (Baldwin Spencer, Ground floor Maker Space, and Science Gallery)

Design Brief 1: Swarm Responsive Tensegrity

This brief explores event, bodies and space as a network system. How can the complexity of the body be explored through machine effect? And In turns, how the effect, choreograph events, and inhabitation of space? We will explore this through designing a responsive tensegrity structure sited in the Science Gallery Melbourne. The brief explores automation through robotic visioning and develop 1:1 scale prototype as a methodology to test and simulate design proposal. We will explore what it means to create an anthropomorphic machine. Can it facilitate and choreograph interactions, activities and happenings as a form of event space?

We will work with world-renowned performance artist Stelarc to construct a tensegrity structure with fluid pneumatic muscle over the two weeks intensive. We will create digital simulations of the installation with overlay swarm behaviour to create visual and sensory effects. Working with computer scientist from the Melbourne School of Engineering, we will explore computer vision to control mechanical systems to develop new spatial species – we will propose a post-Anthropocene landscape that constructs and conditions new social behaviours.

Equipment required:
Laptop + webcam

Software Required:
Adobe Suits (Photoshop and Illustrator), Rhino 6 / 7 and Grasshopper (plug-in: Kangaroo, and Culebra)

Pre-teaching period:
Self-learning online tutorial (if the student is not familiar with Grasshopper plug-in) – Archistar Course

References:

Tschumi, Bernard 1994. Architecture and Disjunction, MIT press.

Young, Liam 2019 (Ed). Machine Landscapes: Architecture of the Post Anthropocene. Architectural Design, Wiley & Sons.

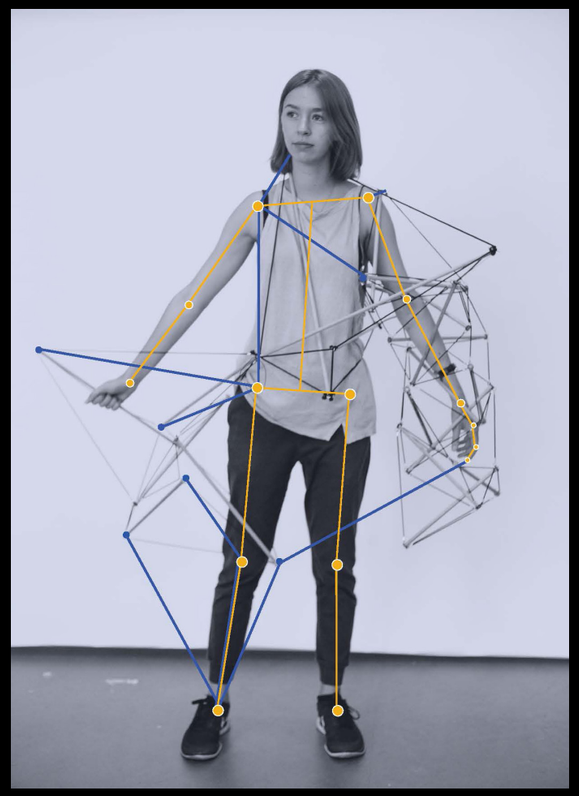
Film: Curtis, Adam 2011. All Watched Over by Machines of Loving Grace Episode 1, 2 and 3. BBC Television, UK. Read Synopsis and watch Episode 1 (59:27) on https://thoughtmaybe.com/all-watched-over-by-machines-of-loving-grace

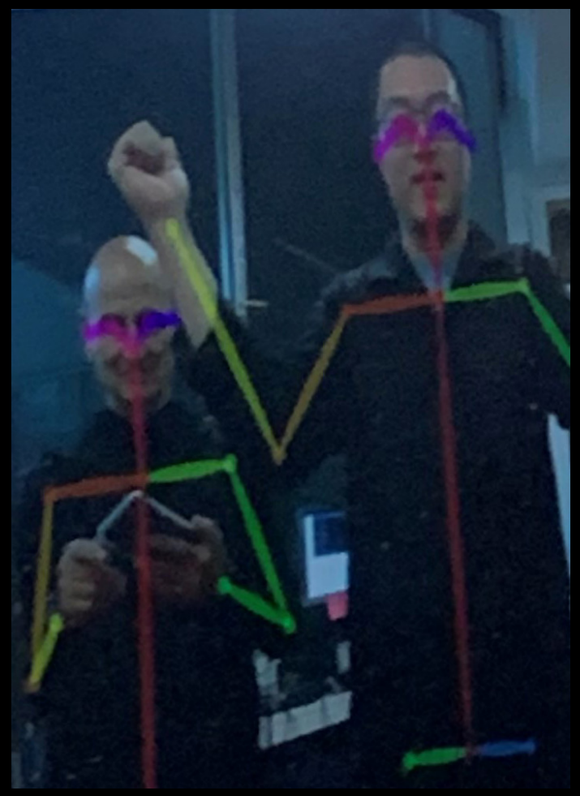
Schedule:

Day	**Content**	**Note | Location | Staff**
Monday, 5th July	AM – Introduction Session + Visit to Science Gallery PM – Tensegrity Workshop	MSD + Science Gallery (All)
Tuesday, 6th July	AM – Group Tutorial PM – Spatial Structure development	
Wednesday, 7th July	AM – Fabrication of Tensegrity structure PM - Fabrication of Tensegrity structure	
Thursday, 8th July	AM – Assembly of Tensegrity structure PM - Assembly of Tensegrity structure	Stelarc visit (TBC)
Friday, 9th July	AM – Robotic Visioning workshop (TBC) PM – Visit to RMIT gallery for live performance (TBC)	
Saturday, 10th July	Design Review (3-6PM)	(All)
Sunday, 11th July	Rest for all	
Monday, 12th July	AM – Design Development PM – Tutorial	
Tuesday, 13th July	AM – Design Development PM – Tutorial	
Wednesday, 14th July	AM – Design Development (presentation) PM – Tutorial	
Thursday, 15th July	AM – Design Development (presentation) PM – Tutorial	
Friday, 16th July	AM – Mock Presentation PM – Final Review (3 – 6PM, TBC)	
	AM = 10 to 1PM AEST PM = 2 to 6PM AEST All activities are conducted on-campus	

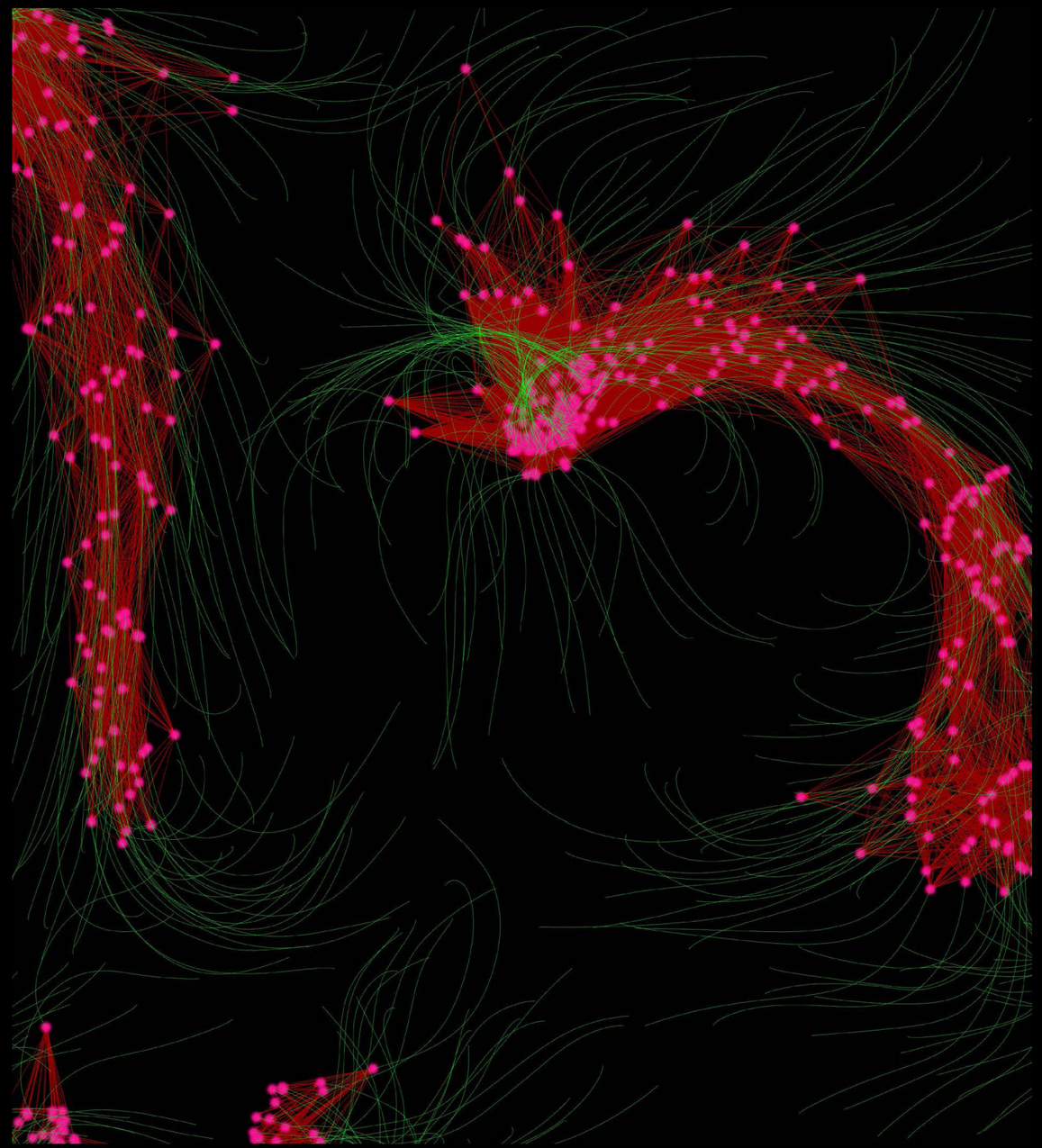
1:1 Tensegrity Structure at the AAVS Melbourne 2016, Unit led by Paul Loh and Brendon Carlin

Final Deliverable:
_ 1 x 30-seconds animation or VR experience
_ 1 x Render image of the final installation
_ 1 x Plan / Section with Matrix diagrams
_ 1 x 1:1 prototype (from week 1)





Top Left: Performative Bodies by Han Li, Rizal Ambotang and Lalo Giuffre, 2016 AAVS Melbourne. Top Left: Computer vision using Openpose software to track body motion. Bottom: Choreographed notation of performance Han Li, Rizal Ambotang and Lalo Giuffre.



Non-directional flocking behaviour simulated in grasshopper, based on the study of Boid.

Design Brief 2: Seclusion & Comfort

This brief questions the notion of Comfort experienced by the body through architectural space and the role technology can play in providing 'Comfort', an essential quality in architectural design which is often unquantifiable or challenging to measure. We will consider Comfort as a multidimensional concept and how design can be instrumental in choreographic physical and mental Comfort through sensory simulations using Virtual Reality (VR).

To understand Comfort, we will explore and reflect on an extreme scenario: a common practice for mental health patients in Victorian psychiatric inpatient units known as seclusion. Students will develop an auto-biographic investigation into Comfort and discomfort through an installation at the Science Gallery Melbourne, titled the 'Isolation Chamber. It is a sculptural response to the practice of using an isolation chamber where a patient is involuntarily detained in a small barren space for an indeterminant amount of time. Such practice goes against international human rights treaties, and yet, it is present in Australian psychiatric services. Through a one-day seminar and Workshop with Rory Rendall and Hamilton Kennedy from the Faculty of Health Sciences, we will explore the notion of Comfort through mental health perspective. We will explore what constitute Rights and how that relates to Comfort.

Following the Workshop, students will develop visual analysis as a spatial narrative that documents the degree of Comfort or discomfort within the installation. In the second half of the brief, in group of two or three students, we will design and construct a spatial aperture that facilitates a mixed-reality experience exploring an environment of Comfort. We will used found material with virtual imaging to heighten a renewed sense of Comfort. VR / mixed experience will explore an environment of Comfort within a 2 x 2-meter physical space.

Equipment required:
Camera, webcam or Go-pro camera + computer + pen knife + cardboard boxes (various thickness)

Software Required:
Adobe Suits (Photoshop, Illustrator and Premiere Pro), Rhino 6/7, Unreal engine + Substance 3D

Pre-teaching period:
2h of Unreal software online workshop - TBC

References:
Gooding and Maker, 2019. Why are the rates of restrictive practices in Victoria's mental health services so high?, Pursuit.

Tomazin, F 2019. Seclusion in mental health units on the rise. The Age.

VMIAC, 2019. Seclusion report: How safe is my hospital?

Video: Seclusion and Restainnt in NSW Mental Health Units. https://www.youtube.com/watch?v=RI4aEj9Tjzs

Day	Content	Note | Location | Staff
Monday, 5th July	AM – Introduction Session + Visit to Science Gallery PM – Seminar + Workshop at Science Gallery	MSD + Science Gallery
Tuesday, 6th July	AM – Group Tutorial PM - Documentation of Experience	
Wednesday, 7th July	AM – Documentation of work PM - Review of documentation (4 to 6PM)	
Thursday, 8th July	VR Exercise and Workshop with a mock environment of Comfort	
Friday, 9th July	VR Exercise and Workshop with a mock environment of Comfort	
Saturday, 10th July	Design Review (3-6PM)	
Sunday, 11th July	Rest for all	
Monday, 12th July	AM – Design Development PM – Tutorial	
Tuesday, 13th July	AM – Design Development PM – Tutorial	
Wednesday, 14th July	AM – Design Development (presentation) PM – Tutorial	
Thursday, 15th July	AM – Design Development (presentation) PM – Tutorial	
Friday, 16th July	AM – Mock Presentation at MSD / Science Gallery PM – Final Review (3 – 6PM - TBC)	
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Choko Ho'ol, Mexico 2011, by Penique Productions

Final Deliverable:
_ 1 x VR experience with site installation
_ 1 x Isometric drawings of the installation
_ 1 x Isometric drawings of a global environment of Comfort (field drawing)
_ 1 x Spatial narrative / analysis (from week 1)

VR scene from a reconstructed VR environment based on Plate VII of Le Carceri d'invensione by Giovanni Battista Piranesi, 1750.

My bed, 1998 by Tracey Emin. An Auto-biographical spatial narrative through objects.

Out of Box, upcycling of waste inituated by Samsung

Cinema at home during COVID lockdown

Staff + Collaborators

David Leggett studied architecture at the University of East London and the University of Westminster. He worked with Edward Cullinan Architects (UK) as Director for over ten years before establishing LLDS / Power to Make in 2011. His built projects includes the Bristol Harbourside Masterplan, Singapore Management University, the International Digital Laboratory for the University of Warwick and the Master Film Store for the British Film Institute. David teaches Master in Architecture at the University of Melbourne since 2012. He has lectured at the University of Lund and has conducted design workshops at the University of Tsinghua, Beijing. He is a founding partner of LLDS/ Power to Make www.llds.com.au

Dr Paul Loh is a senior lecturer at the Melbourne School of Design, University of Melbourne. His research focuses on the cognitive engagement of making in design practice with digital fabrication and robotics. He studied architecture at the University of Melbourne, University of East London (UEL), the Architectural Association (Design Research Lab). He gained his doctorate at RMIT University with a dissertation on Digital Material Practice: the Agency of Making. Paul has previously taught at UEL and the AA. He is a founding partner of LLDS | Power to Make, a Melbourne-based design, research and digital fabrication practice.

Stelarc is a performance artist who has visually probed and acoustically amplified his body. He has made three films of the inside of his body. Between 1976-1988 he completed 26 body suspension performances with hooks into the skin. He has used medical instruments, prosthetics, robotics, Virtual Reality systems, the Internet and biotechnology to engineer intimate and involuntary interfaces with the body. He explores Alternate Anatomical Architectures with augmented and extended body constructs. He has been Principal Research Fellow in the Performance Arts Digital Research Unit and a Visiting Professor at The Nottingham Trent University, UK. Between 2006 and 2011 he was Senior Research Fellow and Visiting Artist at the MARCS Lab, University of Western Sydney, Australia and Chair in Performance Art, School of Arts, Brunel University, Uxbridge, UK. In 2016 he was awarded an Honorary Doctorate from the Ionian University, Corfu, Greece. He is presently a Distinguished Research Fellow in the School of Design and Art, Curtin University.

I am a Phd candidate at School of Computing and Information Systems, The University of Melbourne. I work in the HCI group, advised by Eduardo Velloso and Jorge Goncalves. My research interest is creating deeper connections between human embodied perception and computing devices.

Rory Randall is a Consumer Academic at the University of Melbourne's Centre for Mental Health Nursing and consumer perspective researcher at RMIT's School of Global, Urban and Social Studies. They are focused on striving for research to centre the ideas and perspectives of those who are excluded by institutional processes, particularly with regards to critical mental health.

Hamilton is a Consumer Academic at the University of Melbourne's Centre for Mental Health Nursing. A Consumer Academic means that the expertise that informs their practice is derived from their experience of mental health service use. This means that Hamilton is an ex-patient of public mental health service. Hamilton's work is concerned with the human rights of all and believes a mental health system is not only possible but necessary. As a result their work is concerned with practices such as seclusion, restraint and involuntary detention.

Yuhan (Psyche) Hou recently completed her Master of Architecture at the University of Melbourne. After graduating with the Bachelor of Environments in 2017, she had a one-year internship in Beijing based design practice DTM, in which she was exposed to architectural projects with a range of scales from urban planning to interior design. She completed her independent thesis project in 2020, named Digital Naturalism, in which she co-authored a published paper with Dr Paul Loh. Currently, she is working in Melbourne based design practice LLDS / Power To Make, focusing on advanced digital fabrication. Her main research interests are parametric design and robotic fabrication in architecture.

Jee Hong (Darren) Ng is a University of Melbourne student currently pursuing his Master of Architecture. He has been working with LLDS/ Power To Make since 2017 as a designer in which he works with digital fabrication. Since 2019, he has also been a technical tutor in Digital Design at the University of Melbourne. He is experienced in a wide range of design skills, including NURBS and mesh-based modelling, texturing, real-time rendering and animation.

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