

# Samantha W. T. Chan

✉ samantha@ahlab.org | 🌐 swtchan.com

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## Overview

I am a Human-Computer Interaction researcher. I explore and create technologies which extend human memory and cognition through mobile, wearable, affective and cognition-aware computing. I am effective at researching and implementing interactions beyond laboratory settings to make a meaningful impact on people through my skills in design, prototyping, multi-modal sensing (biosignals), signal processing and applied machine learning. Currently looking for research internships.

## Education

### Ph.D., Human-Computer Interaction

University of Auckland (UoA), New Zealand

Augmented Human Lab. Supervisors: Suranga Nanayakkara, Haimo Zhang and Lynette Tippett.

Mar 2018 to Present

### B.Eng., Engineering Product Development

Singapore University of Technology and Design (SUTD), Singapore

Summa Cum Laude (1st Class Honours). Specialisation: Electrical Engineering.

May 2013 to Sep 2016

## Experience

### Ph.D. Student, UoA

Exploring just-in-time memory training and assistance for older adults through detection of biosignals to infer users' intentions and affective-cognitive contexts.

- Project **Prospero**: Built chat-based applications (Android/iOS) and algorithms which use biosignals of heart rate variability and skin conductance to detect calmness for opportunistic memory training. Work resulted in 3 publications and 3 awards.
- Project **ProspecFit**: Developed Android application to facilitate an effective memory training technique. Work resulted in a journal publication.

Mar 2018 to Present

### Creative Technologist, UoA

Unleash Space - Makerspace, Centre for Innovation and Entrepreneurship

- Conducted training for fabrication equipment use (laser-cutters, 3D-printers, CNC machines).
- Assisted and advised students on developing their creative and entrepreneurial projects.
- Facilitated workshops on topics including Arduino, Makey-Makey robots, AR/VR in Unity.

Jan 2019 to Nov 2019

### Researcher - Robotics, SUTD-MIT International Design Centre

Undergraduate Research Opportunities Programme

- Developed mobile wireless control for amphibious rolling robot via MIT AppInventor and Arduino.
- Designed flexible 3D-printed sleeve in Solidworks to enhance robot's land and water movement.
- Work resulted in a publication, was demoed in Europe Maker Faire '15 and featured on Discovery Channel Canada.

May 2015 to Aug 2016

### Researcher - Participatory Action Research, SUTD

Ho Chi Minh Community Design Project - Vietnam

- Conducted community design workshops, feedback and interviews with residents of Phu Xuan.
- Co-designed and built community space including a bamboo playground with residents, project team and students from local Vietnamese universities.
- Project resulted in a design report booklet and received the **SUTD Humanitarian Award**.

Jan 2015 to Apr 2016

### Industrial Design Intern and Summer Student, Chemtax, Orient Befit and Zhejiang University

Asian Leadership Programme - Hangzhou, China

- Designed compression sportswear prototype, which could enhance runners' performance and blood circulation, using Adobe Illustrator and Rhinoceros 3D software.
- Wearable prototypes were exhibited in Zhejiang University in '14, SUTD in '14 and '15.

May 2014 to Aug 2014

### Researcher - Additive Manufacturing, SUTD-MIT International Design Centre

Undergraduate Research Opportunities Programme

- Built and analysed open-source 3D printer designs to develop reliable and low-cost designs.
- Developed two prototypes based on findings which were demoed in Singapore Maker Faire '15.

Sep 2013 to Jul 2015

## Peer-Reviewed Publications

- [9] **Chan, S. W. T.**, Sapkota, S., Mathews, R., Zhang, H. and Nanayakkara, S. 2020. Prompto: Investigating Receptivity to Prompts Based on Cognitive Load from Memory Training Conversational Agent. In Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) 4, 4, Article 121 (December 2020), 23 pages. <https://doi.org/10.1145/3432190>.
- [8] **Chan, S. W. T.** 2020. Biosignal-Sensitive Memory Improvement and Support Systems. In Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems (CHI EA '20). ACM, New York, NY, USA, 1–7. <https://doi.org/10.1145/3334480.3375031>.
- [7] **Chan, S. W. T.**, Buddhika, T., Zhang, H., Nanayakkara, S. 2019. ProspecFit: In Situ Evaluation of Digital Prospective Memory Training for Older Adults. In Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) 3, 3, Article 77 (September 2019), 20 pages. <https://doi.org/10.1145/3351235>
- [6] **Chan, S. W. T.**, Zhang, H., Nanayakkara, S. 2019. Prospero: A Personal Wearable Memory Coach. In Proceedings of Augmented Human International Conference 2019 (AH '19), March 11–12, 2019, Reims, France. ACM, New York, NY, USA, 5 pages. <https://doi.org/10.1145/3311823.3311870>.
- [5] Sridhar, P. K., **Chan, S. W. T.**, Chua, Y., Quin, Y. W., Nanayakkara, S. 2019. Going beyond performance scores: Understanding cognitive-affective states in Kindergarteners and application of framework in classrooms. International Journal of Child-Computer Interaction (IJCCI), Volume 21, 2019, Pages 37-53, ISSN 2212-8689. <https://doi.org/10.1016/j.ijcci.2019.04.002>
- [4] Buddhika, T., Zhang, H., **Chan, S. W. T.**, Dissanayake, V., Nanayakkara, S., Zimmermann, R. 2019. fSense: Unlocking the Dimension of Force for Gestural Interactions using Smartwatch PPG Sensor. In Proceedings of Augmented Human International Conference 2019 (AH '19), March 11–12, 2019, Reims, France. ACM, New York, NY, USA, 5 pages. <https://doi.org/10.1145/3311823.3311839>
- [3] Sridhar, P.K., **Chan, S. W. T.**, Nanayakkara, S. 2018. Going beyond performance scores: understanding cognitive-affective states in kindergarteners. In Proceedings of the ACM Conference on Interaction Design and Children (IDC '18). ACM, New York, NY, USA, 253-265. <https://doi.org/10.1145/3202185.3202739>
- [2] Elvitigala, D. S., **Chan, S. W. T.**, Howell, N., Matthies, D. J. C., Nanayakkara, S. 2018. Doodle Daydream: An Interactive Display to Support Playful and Creative Interactions Between Co-workers. In Proceedings of the Symposium on Spatial User Interaction (SUI '18). ACM, New York, NY, USA, 186-186. <https://doi.org/10.1145/3267782.3274681>
- [1] Satria, S., Lee, J. W., **Chan, S. W. T.** 2015. Portable Amphibious Spherical Rolling Robot with Live-Streaming Capability for Ground and Aquatic Deployment. IRC Conference on Science, Engineering and Technology (13 May 2015, National University of Singapore, Singapore). <http://ircset.org/main/conference-2015/downloads4/>

## Awards and Honours

- Gold Pin Award**, Student Digital Category 2020  
In recognition of the research project *Prospero* at The Best Design Awards by The Designers Institute of New Zealand. The Gold Pin is coveted under each category as the best in category.
- Honorable Mention, Fast Company World Changing Ideas Award**, Student Category 2020  
In recognition of the project *Prospero*.
- Female Founders Prize by UniServices** 2019  
In recognition of the project *Prospero* for outstanding venture idea at Velocity Innovation Challenge by UoA.
- Auckland Bioengineering Institute Doctoral Scholarship** 2018  
Full-scholarship awarded by The University of Auckland to pursue doctoral studies.
- SUTD President's Graduate Fellowship** 2017  
Full-scholarship awarded by Singapore University of Technology and Design to pursue doctoral studies.

<b>SUTD Humanitarian Award</b> Awarded for outstanding humanitarian work in the research project <i>Ho Chi Minh Community Design Project</i> .	2016
<b>Habitat for Humanity Dedicated Service Award</b> Awarded by Habitat for Humanity Singapore for dedicated service as <i>Treasurer</i> of its Campus Chapter in SUTD.	2015

## Academic and Leadership Service

<b>Organising Committee, Virtual Conference Co-chair</b> ACM International Conference on Mobile Human-Computer Interaction MobileHCI 2021	
<b>Organising Committee, Student Volunteer Co-chair</b> ACM International Conference on Mobile Human-Computer Interaction MobileHCI 2022 (To start)	
<b>Reviewer</b> CSCW 2021, HRI 2021, CHI 2021, ETRA 2021	
<b>Student Volunteer</b> ACM International Conference on Mobile Human-Computer Interaction (MobileHCI) 2020	Sep to Oct 2020
<b>Vice-President</b> (Founding Member, Former Events Head), Executive Committee, UoA Engineering Postgraduate Students Association. Led pioneering team to establish new association.	May 2019 to Present
<b>Delegate</b> , United Nations, University Scholars Leadership Symposium, Bangkok Humanitarian Affairs Asia and United Nations Development Programme	Aug 2017
<b>Treasurer</b> (Founding Member), Executive Committee, SUTD Habitat for Humanity Singapore Campus Chapter. Established new student club. <b>Dedicated service award.</b>	Sep 2013 to Aug 2016
<b>Publicity Committee</b> , SUTD <i>Open Mic Session</i> for SUTD Bands. Strategies attracted over 300 ticket sales (36% of student population).	Feb 2014

## Teaching Experience

<b>Graduate Teaching Assistant</b> , Creative Arts and Industries, UoA Design and Assistive Technologies (DESIGN 243). Co-developed curriculum. Lectured on Memory and Learning.	Jun to Nov 2020
<b>Graduate Teaching Assistant</b> , Creative Arts and Industries, UoA Design Methods and Processes (DESIGN 100). Assisted instructor during classes. Advised students.	Mar to Jun 2020
<b>Graduate Teaching Assistant</b> , Chemical and Materials Engineering, UoA Applied Chemistry: Conductive Polymers (CHEMMAT 206). Facilitated lab sessions. Marked reports.	Mar to Jul 2019
<b>Graduate Teaching Assistant</b> , Engineering Product Development, SUTD Systems and Control (30.101). Assisted instructors during tutorials. Advised students.	Jan to Apr 2017
<b>Teaching Assistant</b> , SUTD Chemistry: From Atoms To Crystals (10.003). Co-developed curriculum, question sets and teaching materials for supplementary classes. Tutored peers.	May to Aug 2013

## Students Mentored

<b>Tamil Selvan</b> , Masters, Empathic Computing Lab, UoA	2020
<b>Jovana Lazarevic</b> , Undergraduate, University of Novi Sad	2020
<b>Rebecca Matthews</b> , Undergraduate, Manipal Institute of Technology (Now Masters at University College Dublin)	2019
<b>Shardul Sapkota</b> , Undergraduate, Yale-NUS College (Now at Shopee)	2019
<b>Adrian Robertson</b> , Undergraduate, Carleton University	2018

## Skills and Tools

**Programming:** Python, Java, JavaScript, R, C/C++, C#

**Prototyping and Research Analysis:** MATLAB, Unity, Arduino, NVivo, SPSS

**Machine Learning:** Scikit-learn, TensorFlow, PyTorch, WEKA

**Design:** SolidWorks, Rhino, Fusion 360, Adobe Creative Suite (Photoshop, Illustrator, Premiere Pro, After Effects)

**Bassist, Ukulelist and Guitarist:** Performed with Delta Infinity SUTD Band '13 to '16 and for 10+ external events

**Film-Maker:** Made seven short-films. Received three awards.

## References

### **Dr. Suranga Nanayakkara**

Associate Professor

Auckland Bioengineering Institute, UoA

Ph.D. Supervisor (4 years)

suranga@ahlab.org

### **Dr. Joel Yang**

Associate Professor

Engineering Product Development, SUTD

Academic Mentor (4 years)

joel\_yang@sutd.edu.sg

### **Dr. Haimo Zhang**

Research Fellow

Auckland Bioengineering Institute, UoA

Ph.D. Co-supervisor (4 years)

haimoz@acm.org