

# Tamil Selvan Gunasekaran

RESEARCHER · HUMAN COMPUTER INTERACTION

*Empathic Computing Lab, Auckland Bioengineering Institute, 70 Symonds Street, Grafton, Auckland, 1010*

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## Education

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### The University of Auckland

MENG IN BIOENGINEERING

- Thesis: Exploring Novel Interaction using Soli Radar Sensor
- Advisor: Dr. Mark Billingham

*Auckland, New Zealand  
December 2020 - March 2022*

### Vellore Institute of Technology

B.TECH. IN ELECTONICS AND COMMUNICATION ENGINEERING

- Honors thesis/undergrad research advisor: Dr. Velmathi

*Chennai, India  
July 2016 - July 2020*

## Research Projects

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### RadarDesk: TableTop Based Soli Interactions

PROJECT LEAD - COLLABORATION WITH GOOGLE ATAP

- Developing a reconfigurable multi-soli(FMCW Radar) interactive tabletop system that synchronizes multiple radar signals for input and interaction.

*January 2021 - Present*

### RadarHand: a Wrist-Worn Radar for Proprioceptive Gestures

PROJECT COLLABORATOR - COLLABORATION WITH GOOGLE ATAP

- Conducted studies to design guidelines and understand proprioceptive-based gestures for smartwatch interaction.
- Developed a deep neural network for training gestures from radar range-Doppler data.
- Analysed data from the user studies.

*October 2020 - September 2021*

### Kinvoices: Using Voices of Friends and Relatives in Voice Interfaces

PROJECT COLLABORATOR

- Conducted studies to design guidelines and understand people's perceptions on voice interfaces which use the voices of friends and relatives, resulting in a publication [2].
- Deployed AI voice cloning and synthesis tool on Google Cloud within a Django API (Python)
- Developed system to receive reminders in cloned voices on Amazon Echo Dot smart speakers

*March 2020 to September 2020*

### Electronic Component Sorting Robot in E-Waste Management

PROJECT LEAD

- Developed a smart robot system that identifies and sorts the electronics components such as resistors, capacitors, coils and IC's from the unused thrown printed circuit boards.

*June 2019 - December 2020*

## Experience

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### Research Assistant

EMPATHIC COMPUTING LAB, UNIVERSITY OF AUCKLAND

- Research on new input and interactions using FMCW Radar(Soli) Sensor in collaboration with Google ATAP.

*October 2020 - Present*

### Visiting Researcher

AUGMENTED HUMAN LAB, UNIVERSITY OF AUCKLAND

- Assisted PhD student with their user studies and research
- Developed software systems for the research project

*December 2019 - September 2020*

### Intern

PETROFAC ENGINEERING SERVICES PVT. LIMITED

- Worked on Computer Networks, Sensors and Instrumentation application in Petroleum Extraction.

*June 2019 to August 2019*

## Vice Chairman

June 2018 - December 2019

### IEEE ROBOTICS AND AUTOMATION SOCIETY, VIT CHENNAI

- Head of Research and Development in IEEE -Robotics and Automation Society student chapter of VIT- Chennai.
- Validate the feasibility of potential project ideas. Initiate, manage and successfully complete the identified projects. Train students to meet current industrial skills.
- Successfully conducted 18+ Workshops and 12 Hack-o-thons and Guided a team to develop Swarm Robots for Military purpose and presented in a competition conducted by DRDO, India.

## Awards, Fellowships, & Grants

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### Graduate Research Fellowship

December 2020

#### GOOGLE ATAP - UNIVERSITY OF AUCKLAND

- Awarded Full Scholarship for Masters Program at UOA.

### Best Paper Presentation Award

August 2019

#### IRCE, NUS, SINGAPORE.

- Awarded Best Paper Presentation award for presenting the Research paper in Electronic Component Sorting Robot in E-Waste Management.

### Winner, Workshop

July 2019

#### SIEMENS HEALTHINEERS PVT. LIMITED

- Innovation Management and Leadership Certification Program (IMLEAP)– Presented solutions pertaining to Diagnosis Treatment of Stroke patients using Artificial Intelligence.

### Winner, Make-a-thon

December 2018

#### ROBOTICS CLUB, VIT CHENNAI

- Won 1st prize for developing Mars Rover - sensor fusion system amongst the top 120 students selected in India.

### Best project of the year

October 2018

#### VIT CHENNAI

- Awarded Best project for the year award for 2018 by VIT Chennai for creating Autonomous Farm surveillance and Crop Health monitoring Robot.

### Winner

February 2018

#### START-UP HUNT COMPETITION- VIT CHENNAI.

- Won 1st prize for presenting a business and prototype Model on Assistive technology for Blind people and Geriatrics. Awarded 50,000 Rupees for developing the product by Ministry of MSME – Government of India.

### Dr.A.P.J. Abdul Kalam IGNITE Award

February 2014

#### NATIONAL INNOVATION FOUNDATION, INDIA

- Awarded Young Scientist of the year for Invention of Automated Crutch to Wheel chair conversion system..

## Publications

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### PUBLISHED

1. **Tamil Selvan Gunasekaran**, Ryo Hajika, Chloe Dolma Si Ying Haigh, Yun Suen Pai, Danielle Lottridge, and Mark Billingham. 2021. Adapting Fitts' Law and N-Back to Assess Hand Proprioception. In Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems (CHI EA '21). Association for Computing Machinery, New York, NY, USA, Article 245, 1–7. DOI: <https://doi.org/10.1145/3411763.3451699>
2. Chan, S. W. T., **Tamil Selvan Gunasekaran**, Pai, Y. S., Zhang, H., Nanayakkara, S. 2021. KinVoices: Using Voices of Friends and Relatives in Voice Interfaces. In Proceedings of ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW '21). ACM, New York, NY, USA, 24 pages. DOI: <https://doi.org/10.1145/3479590>
3. Ryo Hajika, **Tamil Selvan Gunasekaran**, Alaeddin Nassani, Yun Suen Pai, and Mark Billingham. 2021. VRTwICh: Enabling Micro-motions in VR with Radar Sensing. In SIGGRAPH Asia 2021 Posters (SA '21 Posters), December 14–17, 2021, Tokyo, Japan. ACM, New York, NY, USA, 3 pages. <https://doi.org/10.1145/3476124.3488650>

## IN REVIEW

1. Ryo Hajika, **Tamil Selvan Gunasekaran**, Chloe Dolma Si Ying Haigh, Yun Suen Pai, Danielle Lottridge, Eiji Hayashi, and Mark Billinghurst 2022. RadarHand: a Wrist-Worn Radar for Proprioceptive Gestures **Under Review IMWUT 2022**

## IN PREP

1. **Tamil Selvan Gunasekaran**, Ryo Hajika, Yun Suen Pai, Jaime Lein, Eiji Hayashi, and Mark Billinghurst 2022. **For UIST 2022**

## Teaching Experience

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### Graduate Teaching Assistant

*Fall 2021*

DESIGN AND AUTONOMOUS TECHNOLOGY, CREATIVE ARTS AND INDUSTRIES, UoA

- Co-developed curriculum, Guided projects and evaluated assignments for a class of 52 students. Lectured on Deep Learning and its Applications

### Teaching Assistant

*2018 - 2019*

ELECTROMAGNETIC WAVE THEORY, VELLORE INSTITUTE OF TECHNOLOGY

- Prepared Coursework, Guided projects and evaluated assignments for a class of 60 students

## Skills and Tools

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

**Prototyping and Research Analysis :** Arduino, Raspberry Pi, Unity, MATLAB, SPSS

**Framework:** Machine Learning (Scikit-learn), Deep Learning(Keras, TensorFlow, PyTorch)

**Design:** Fusion360, Figma, Adobe Creative Suite(Photoshop, Illustrator, Premiere Pro, After Effects)

**Fabrication:** 3D Printing, Laser Cutting