

# Haozhe (Zac) Wang

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## Objective

As a PhD graduate from Monash University, my research focuses on developing cortical prostheses, mainly through creating realistic computer simulations of cortical visual prostheses. My interests extend to computer vision, artificial intelligence, and computational neuroscience. I aim to facilitate brain-machine interface development by using mathematical models to uncover the mechanisms underlying neural modulation.

## Education

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### Monash University

Doctor of Philosophy (Biomedical Engineering)

Aug 2021 – June 2025

-Topic: Investigating the psychophysical experience of the cortical visual prosthesis using computer simulation.

- Supervisor: Prof. Yan Tat Wong and Dr. Elizabeth Zavitz



### Monash University

Bachelor of Engineering (Honours) and Bachelor of Science

Jul 2017 - Jun 2021

- Grade: HD (High Distinction)

- Specialisation in **Electrical and Computer System Engineering** for the Engineering Degree

- Extended Major in **Psychology** for the Science Degree

- Minor in **Mathematics** for Science Degree

- Finish engineering final year project with HD (High Distinction)



### Monash College

Diploma of Engineering

Nov 2015 - Jul 2016

- Grade: HD (High Distinction)

- Academic Excellence Award for Introduction to computer systems, networks, and security

## Publications

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H. Z. Wang and Y. T. Wong, "A novel simulation paradigm utilizing MRI-derived phosphene maps for cortical prosthetic vision," Journal of Neural Engineering, 2023, doi: 10.1088/1741-2552/aceca2.

H. Z. Wang and Y. T. Wong, "Raster Scanning Can Improve Task Performance in Simulated Prosthetic Vision." IEEE Trans Neural Syst Rehabil Eng. 2025. doi: 10.1109/TNSRE.2025.3617891.

H. Z. Wang and Y. T. Wong, "Utilization of brain scans to create realistic phosphene maps for cortical visual prosthesis simulation studies," 2023 45th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), Sydney, Australia, 2023, pp. 1-4, doi: 10.1109/EMBC40787.2023.10341189.

H. Z. Wang and Y. T. Wong, "Improvement of dynamic phosphene presentation for a cortical visual prosthesis is task-specific" 2024 46th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), Orlando, USA, 2024, pp. 1-4, doi: 10.1109/EMBC53108.2024.10782366

## Work Experience

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### Teaching Associate

Monash University

Mar 2022 - June 2025

- ECE4081 Medical Instrumentation (Arduino, electronics, data analysis, signal processing, ...)
- ECE2111 Signal and Systems (signal processing, Fourier transform, Laplace transform ...)
- ECE2191 Probability Models in Engineering (random variables, limit theorems, convergence, bounding techniques, Markov chain ...)
- BMS1031 Medical Biophysics (Nernst equation, action potential, ion channels...)



### Student Research Assistant

CSIRO

Mar 2021 - Jun 2021

Analysing data from the DARPA challenge event log



### Human Robotic Interaction Summer Research Student

Monash University

Dec 2020 - Feb 2021

Detecting unexpected robot actions from the behaviours of human observers.

Create an automatic pipeline that uses a Natural Language Processing algorithm to extract events from an HRI session recording. (GCP, **Tensorflow**)

<https://www.monash.edu/engineering/robotics/projects/robots-in-public-space>



### Final Year project – Cortical visual prosthesis

Monash University

Mar 2020 - Nov 2020

Apply machine learning algorithms to simulate prosthetic vision to mimic phosphene patterns after the implantation of Bionic eyes. (**MATLAB, Python**)



### Healthcare Innovation Summer Scholar – Gestational Diabetes Predictor

MYMI (Monash Young MedTech Innovators)

Nov 2019 - Feb 2020

Research, project evaluation, and Web app development (**Vue.js**).

We developed a tool that can be used to calculate the probability that an individual woman affected by gestational diabetes will experience an adverse pregnancy outcome.

The personal tool GDM: <https://lifestyle.personalgdm.com/>



### Computational Neuroscience Summer/Winter Research Student

Monash Biomedical Imaging

Jun 2018 - Jul 2018

Nov 2018 - Feb 2019

Worked on decoding neuron activity from optical imaging data at Prof Naotsugu Tsuchiya's lab. (**MATLAB, Python**)

## **Skills**

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Competent programming skills in Python and MATLAB for stimulus presentation and data analysis.

Confident with other data analysis tools such as IBM SPSS and R.

Confident with common deep learning frameworks, such as Pytorch and TensorFlow\*.

Familiar with neural dynamics and neural models\*

Familiar with other programming languages, such as C/C++ and JavaScript.

\*Certifications can be found on my [LinkedIn](#) website.

## **Scholarship & Awards**

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2016	Monash College Academic Excellence Award
2018	Monash Winter Research Scholarship (Psychology)
2019	Monash Summer Research Scholarship (Psychology)
2019	Faculty of Engineering Dean's Honors List (Engineering)
2020	Monash Healthcare Innovation Summer Scholarship
2021	Monash Summer Research Scholarship (Engineering)
2021-2025	Monash Research Scholarship (Electrical & Computer Systems Engineering) Faculty of Engineering International Postgraduate Research Scholarship (FEIPRS)
2024	IEEE EMBC NextGen Scholar Award
2025	Postgraduate Publication Award

## **Media**

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A better 'map' of the lights you see when you close your eyes can improve 'bionic eye' outcomes:

<https://www.monash.edu/news/articles/a-better-map-of-the-lights-you-see-when-you-close-your-eyes-can-improve-bionic-eye-outcomes>

## **Language**

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Mandarin Chinese – Native speaker.

English – Professional working proficiency, lived in Australia for 10 years, did multiple public speeches and presentations throughout my PhD.