

# Hsin-Hao Yu, Ph.D.

Versatile, cross-disciplinary data scientist skilled in research and innovation. Turning data into impactful insights.

## Career Summary

- Over ten years of experience as a data-focused researcher and data scientist in academia (Monash University) and in the tech industry (IBM Research). Passionate about working in cross-disciplinary teams to solve complex problems with powerful computation.
- Enthusiastic about translating AI research to practices, to bring tangible values to clients.

## Key Skills

- **Distilling rigorous insights from data:** Skilled in machine learning/AI, statistics, deep learning and image analytics. Published original research papers in high-impact journals, which demand the highest standard of rigour and quality.
- **Turning messy data into stunning visualisations:** Passionate in creating effective images and animations to illustrate complex data.
- **Communicating for impacts:** Extensive experience in giving presentations and demos in academic and business settings. Successful university lecturer and science writer for the general public.
- **Developing and managing cross-disciplinary projects:** Collaborated successfully with clinicians and scientists in Australia, USA, and Japan. Managed government-funded research projects. Worked with IBM clients to achieve strategic objectives.

## Professional Experience

### Data Scientist, IBM Consulting ANZ

2021-

Member of the Centre of Applied Research, with the mission to accelerate the translation of innovative AI research to business practices.

#### *Responsibilities*

- Provide strategic consultation in advanced AI for IBM Consulting's practices
- Develop new business opportunities for IBM Consulting
- Facilitate the collaboration between IBM Research and IBM Consulting

#### *Achievements*

- Developed proposals in innovations in AI for IBM clients
- Negotiated new client projects for 2022

### Research Scientist (Research Staff Member), IBM Research Australia

2018-2021

#### *Responsibilities*

- Increase the impact of IBM Research in healthcare AI by co-developing innovative grants, IP and research programs with clients at New York University. Publish AI research in clinical journals.
- Broaden the scope of Melbourne lab's healthcare agenda by developing new collaboration and business opportunities. Negotiate joint study and data transfer contracts. Manage collaborative relationship with clients.

#### *Achievements*

- Innovation: Developed algorithms to detect and manage glaucoma from retinal scans (via Optical Coherence Tomography), as part of a NIH grant co-developed with New York University. Published in a clinical journal and a high impact journal. Filed 2 patents.
- Business outcomes: Co-developed 3 large-scale grants involving multiple international clinical partners for public and private funding agencies. Successful at securing funding from the National Institute of Health of the USA government. Presentations and demos for IBM clients and IBM executives.
- Professional development in technical skills: Played active roles in the development of client demos (React + Node.js), and a secured platform for data science competitions (Docker, Kubeflow).

#### **Research Fellow, Department of Physiology, Monash University**

2008-2018

#### *Responsibilities*

- Conduct cutting-edge research in neuroscience; secure research funding.
- Develop and manage international collaboration projects.
- Mentor and supervise PhD and Honours students; Lecture in undergraduate units.

#### *Achievements*

- Published papers in top journals. Managed 3 research grants, supervised 5 Honours students and 2 Ph.D. students. Lectured in neuroscience and computational neuroscience.
- Recipient of the prestigious Australian Research Council Discovery Early Career Researcher Award (**DECRA**) from the Australian government in 2013.

## **Education**

Ph.D. in **Cognitive Science**, University of California San Diego (USA)

UC San Diego is a Top 50 university of the world. UCSD Cognitive Science is a unique cross-disciplinary program that integrates computer science with neuroscience and psychology, with emphasis on AI. Courses in machine learning, neural networks, AI, computational neuroscience and computer vision.

B.A. in **Applied Mathematics**, National Chiao Tung University (Taiwan)

NCTU is a top university in Taiwan. Took classes in programming, AI, and many advances courses in mathematics.

## Technical skills

Python, R, Mathematica, deep-learning frameworks (Tensorflow), cloud platform, full-stack web development (React, Node.js, MongoDB), CI/CD (continuous integration/continuous delivery)

## Certification and training

- Microsoft Certified Azure Data Scientist Associate (2021)
- IBM AI Associate Leader
- IBM training in Containers & Kubernetes Essentials, Cloud Essentials
- IBM training in Agile/Scrum methodology

## Selected Publications (full list: <https://hhyu.org/publications>)

- Yu et al (2020) “Estimating global visual field indices in glaucoma by combining macula and optic disc OCT scans using 3D convolutional neural networks”: A method to increase the clinical efficiency of glaucoma monitoring, using **deep neural networks and statistical models** to infer visual functions from retinal scans. Published in the clinical journal *Ophthalmology Glaucoma*.
- Yu et al (2020) “A twisted visual field map in the primate dorsomedial cortex predicted by topographic continuity”: Used **self-organization algorithms** and vector field analysis to explain a large dataset collected with electrode arrays in the visual cortex. Published in the high impact journal *Science Advances*.

## Other Activities

- 2021: Panel reviewer for IBM Research’s Accomplishment Award.
- 2019: Demonstrator at IBM’s annual Think Summit event in Sydney.
- 2017: Symposium co-organizer for the Asian Pacific Conference on Vision (APCV).
- 2018-2021: Reviewer of neuroscience and AI papers for academic journals.
- 2013-2018: Reviewer of fellowship and grant applications for Australian funding agencies (ARC and NHMRC).

## Patents

- Two USA patents filed in 2020.