

EXPERIENCE

AI Safety Camp

Participant/Research Engineer - Part time

Online
Jan 2021–Present

- Working on interpreting the neural mechanisms of behaviour in reinforcement learning agents. ([Paper](#) in progress.)
- Responsibilities: creating [visualisations](#) and [interactive panels](#); helping with experimental design and implementation; debugging neural networks; helping guide the research direction.

Machine Learning Alignment Bootcamp - Redwood Research

Participant

United States
Jan 2022

- Studied and implemented state-of-the-art machine learning models. In particular, implemented Bert and GPT2 from scratch (without torch.nn modules), explored training schemes such as data and pipeline parallelism, and finetuned models on downstream tasks.

NukkAI

Research Engineer

France
Jun 2019–Jan 2021

- Research and application of symbolic AI methods (in particular, Inductive Logic Programming) in the game of Bridge. (e.g. see [2].)
- Lead developer of NuTrain: a Bridge training tool built using a microservice architecture with Python APIs and a Vue.js frontend. (See [video tutorial](#).)
- Developed a tool which combines logical deduction and tree search to produce automated commentary for Bridge card play.

TCCS

Data Scientist/Machine Learning Engineer

Australia
Feb 2017–Jun 2019

- Co-founded the group and developed several successful predictive sports models, some of which are still profitably deployed today.
- Led a small team in creating and managing databases, data scrapers, and other software tools and libraries to support model development and production.

Self-Employed

Card Player

Australia
2009–2016

- Poker: Professional online and live play.
- Bridge: Represented Australia on various junior teams. Best results: 1st - U21 Asia Pacific Championships 2011, 9th - U26 World Championships 2016.

EDUCATION

University of Sydney

B.S. Advanced Studies (Honours) (Computer Science)

Australia
Mar 2021–Dec 2021

- Graduated with Honours Class I and The University Medal (WAM: 92.5).
- Thesis on Reinforcement Learning with Linear Temporal Logic objectives [1].
- 1st/405 students: COMP5046 (NLP). 2nd/294 students: COMP5329 (DL).

- Graduated with Distinction (WAM: 80).
- Spring 2013 Project: Generalising the Zappa-Szép Product. Mark: 88.
- Aut 2013 Project: Bounded Operators in Normed Vector Spaces. Mark: 91.

RESEARCH PAPERS

- [1] **D. Braun**, “Getting to school on time: Completing linear temporal logic objectives before a fixed deadline with reinforcement learning”, Honours Thesis, <https://danbraunai.github.io/files/thesis.pdf>, 2021.
- [2] V. Ventos, **D. Braun**, C. Deheeger, *et al.*, “Construction and Elicitation of a Black Box Model in the Game of Bridge”, To appear in Advances in Knowledge Discovery and Management, Springer, 2020. arXiv: 2005.01633 [cs.AI].

SKILLS

- Python (PyTorch, Huggingface, Pandas, Numpy, Matplotlib), JavaScript (Vue.js, D3, jQuery), HTML/CSS, SQL, Prolog, Git, Gitlab CI/CD, Docker.
- Theoretical knowledge and applied experience in a wide range of AI sub-areas including Deep Learning, Reinforcement Learning, Inductive Logic Programming, Temporal Logic.
- English (native), French (basic conversational).

REFEREES

Available on request.