# Xavier Holt

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## Skills

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|---|---|
| Deep learning: | Large scale distributed model training, multimodal models, contrastive learning. |
| Computer Vision: | 2D/3D multi-input CNN models, vision transformer models, image to text models. |
| NLP: | Transformer models, text to image models, large scale language model training. |
| ML Ops: | Kubernetes, docker, AWS, slurm |
| Traditional ML: | Tabular models, xgboost, lightgbm, sklearn. |
| Data Engineering: | Distributed data processing, input visualisation, SQL/NoSQL databases. |
| Management: | Scrum ceremonies, recruitment, people management. |

## Experience

**harrison.ai** — Sydney, Australia
*Lead ML Engineer* — Dec 2019 - Present

- Technical lead responsible for delivering annalise.ai Enterprise CXR x-ray model. This model processes 25% of all x-rays in Australia (also deployed internationally). Diagnostic assistant predicting 127 findings with performance equal to or greater than a trained radiologist.
- One of first 20 hires (now 200+), helped build ML infrastructure and models from the ground up.
- Built infrastructure and platform for building ML models across the organisation.
- 50/50 management/individual contributor.
- Led a cross-disciplinary unit team of 10 people, including software developers, applied ML engineers, clinical specialists and product.
- Led novel model development squad, implementing SotA techniques and deriving new approaches in problem space.
- Published novel research in journals and patents.
- Helped productionise and deploy product both in-cloud and on-device.
- Hired and managed direct reports. Ran sprint and scrum processes.
- Strong general backend development expertise. Responsible for delivery of a wide variety of components in micro-service architecture (containers, HTTP endpoints, queuing interfaces etc.).

**Sypht** — Sydney, Australia
*Co-Founder and Senior ML Engineer* — Dec 2017 - Dec 2019

- Founding team member of commercialised, productionised machine learning API platform – initially as sole machine learning expert on team.
- Core technical role responsible for both machine learning stack (CV/NLP deep learning models/traditional ML) as well as end-to-end productionisation (automated testing, API endpoint management, computational efficiency).
- Helped grow and scale team from 5-15 members, product from zero to two million+ paid requests per month; helped secure funding of several million dollars.

**BCG Digital Ventures** — Sydney, Australia
*Data Scientist* — Dec 2017 - Aug 2018

- Developed and scaled machine learning start-ups for large commercial partners.
- Worked with leadership team to coordinate hiring and growth of machine learning team.
- One of the founding team members of 'Sypht' (above) – a successful NLP venture.
- One of only 5% of employees globally to receive highest band in annual performance review.

**Zip Money** — Sydney, Australia
*Data Scientist* — Jul 2017 - Dec 2017

**Hugo** — Sydney, Australia
*NLP Researcher & Software Engineer* — Nov 2015 - Aug 2016

**The University of Sydney** — Sydney, Australia
*Tutor* — Mar 2015 - Nov 2017

**The University of Sydney** — Sydney, Australia
*Junior Analyst* — Jan 2014 - Jan 2015

## Education

**Scrum Alliance** Sydney, Australia
Certified Scrum Master 2021 - 2021

**Macquarie University** Sydney, Australia
Master of Research (Science and Engineering). Master's thesis in Natural Language Processing. *GPA: 94% (thesis), 93% (overall). Top 1% of students.* 2017 - 2018

**The University of Sydney** Sydney, Australia
Bachelor of Science (Advanced Mathematics) (Honours). Computer Science/Statistics. *GPA: 93% (thesis), first Class Honours. Top 1% of students.* 2013 - 2016

## Honours

**Hackathons** Various
Harrison.ai internal hackathon 2021, 1st place; Melbourne University Business Analytics Datathon 2017, 5th place; Sydney Unearthed Hackathon 2017, 2nd place & People's Choice; Macquarie University Data Science Challenge 2017, 4th place. 2017-2021

**Research Training Pathway Scholarship** Macquarie University
Competitive scholarship awarded on academic merit. 2017

**Microsoft Research Asia Prize for Multimedia Technologies** Microsoft
Awarded to the student with the most outstanding performance in senior units of study in the field of multimedia technologies and computer vision. 2016

**Appen Butler Hill Scholarship for Excellence in Computational Linguistics** Appen Butler Hill
Awarded to the top student undertaking an Honours project in Computational Linguistics. 2016

**Human Centred Technology Research Scholarship** Sydney University
Research scholarship offered for project in Natural language processing. 2015

**Data61 Summer Research Scholarship** Data61
Research scholarship offered for project in non-parametric Bayesian Statistics. 2015

**Vice Chancellor's Recognition** Office of the Vice Chancellor
Awarded and presented by the University Vice Chancellor for exceptional academic performance and overcoming adversity. 2014

**Undergraduate High Honour Roll** Sydney University
Awarded by the School of IT for achieving a high-distinction average across all subjects within the school. 2013, '14, '15, '16

## Publications, patents, open source contributions

**Machine Learning Augmented Interpretation of Chest X-rays: A Systematic Review** 2023
Diagnostics

**Do comprehensive deep learning algorithms suffer from hidden stratification? A retrospective study on pneumothorax detection in chest radiography** 2021
British Medical Journal Publishing Group.

**(Patent) Systems and methods for automated analysis of medical images** 2021
AU2021289232A1

**(Patent) Method and system for automated generation of text captions from medical images** 2021
WO2022006621A1

**Effect of a comprehensive deep-learning model on the accuracy of chest x-ray interpretation by radiologists: a retrospective, multireader multicase study** 2020
The Lancet Digital Health 3 (8), e496-e506.

**Probabilistic models of relational implication** 2019
arXiv preprint arXiv:1907.12048

**Extracting structured data from invoices** 2018
published as part of the Australasian Language Technology Association conference proceedings.

**Learning typed entailment graphs with global soft constraints** 2018
published as part of the Transactions of the Association for Computational Linguistics.

**(Dataset) Relational Implication** 2017
provided a public, crowd-sourced dataset for the relational implication problem.

**Presenting a New Dataset for the Timeline Generation Problem** 2016
published as part of the Australasian Language Technology Association conference proceedings.

**(Dataset) Timeline Generation** 2016
provided a public, crowd-sourced dataset for the timeline generation problem.