Ori Livson

https://ori-livson.com/

Current Roles

Children's Medical Research Institute (ProCan) - *Lead Software Engineer*

Dec 2021 - Present

ProCan is a cancer proteomics research lab, where my role centres around the development of their Big-Data capability, automated data analysis, visualisation, user-interfaces, LLM Based Applications, specialised HPC environments and CI/CD pipelines.

I routinely work with Cancer Data Scientists, Proteomicists and Oncologists to support exploratory data analysis, visualisation, quality control etc. Primarily as the lead developer of POCKet (Proteomics Oncology Knowledge Base) - a federated query engine and event-driven data warehousing framework.

To enable the above, I've keenly taken a central role in stakeholder engagement, communications, training, requirements gathering, and mentorship regarding software development duties across teams.

Key technical skills: Python, Data Science frameworks, Postgres, Trino (FKA Presto), Data Lake Development, Neo4j, Kubernetes, Vue JS.

University of Sydney - *Doctor of Philosophy (PhD) - Computer Science*

Mar 2024 - Present

In the Center for Complex Systems, my PhD project "Self-Reference and Incomputability in Collective Decision-Making" investigates novel applications of methods from computability theory to the study of limitative results in social decision making and complex systems theory. Awarded the RTP Stipend Scholarship at the 2024 APA rate on a competitive basis.

University of Sydney - *Associate Lecturer PhD Teaching Fellow*

May 2025 - Present

In this role I support the coordination, development and delivery of lectures and assessments for undergraduate & postgraduate units in the School Computer Science. To date, this includes the Turing Machine module for COMP2022: Models of Computation.

Prior Employment

Isentia - *Software Engineer*

2020 - 2021 (1.5 years)

Isentia is a news-media monitoring company, where my role centred around software development for natural language processing of voice-to-text transcripts and multimedia ingestion. The former involved working closely with an ML architect, the highlights of my involvement being the development of:

- A novel mathematical similarity measure for transcription segmentation jobs. This measure was used to score ML models against each other and human equivalents.

  For demonstrating a model's 15% improvement over its predecessor in closeness to human equivalents, I was a recipient of the 2021 Jeffress Award and Q4 2021 Innovation awards.

- The development of a "capitalization service", which remedied approximately 90% of incorrect or missing capitalizations by Google voice-to-text transcripts.

- A transpiler from a deprecated text searching language ISYS to ElasticSearch queries.

The latter involved developing AWS serverless, event-driven software to record digital media streams, as well as hardware and software solutions for terrestrial TV and Radio capture across 70 sites in Australia, NZ and Singapore.

Key technical skills: Python, AWS Serverless development esp. API Gateway, ECS, S3, SQS, SNS; Linux System Service Development, NLP

ezyCollect - *Data Scientist*

2018 - 2020 (2 years)

ezyCollect is a web application focused on accounts receivables automation, online payments and risk monitoring, where I was their first Data Scientist hire. I was responsible for exploratory data analysis for Marketing and Sales, as well as organising teams to develop and support data products such as insights dashboards and debtor risk profiling etc.

I also performed all my own software development for Data Warehousing, ETL, Web Development etc.

Key technical skills: Python, Data Science inc. Deep Learning, Clustering, Statistical Tests, Data Engineering, AWS Serverless development esp: AWS Lambda, Glue, Athena, SQS, S3, SQS, SNS; Web Development.

Macquarie University - *Demonstrator*

2017 - 2018 (1.5 years)

Demonstrator for classes over six different subjects on Programming and Web Development for Master of IT Students, Calculus and Linear Algebra for Undergraduates, and a General Interest Mathematics subject about the history and applications of Mathematics in society.

WIN Solutions - *Application Developer*

2015 - 2017 (2 years)

WIN Solutions is a company that produces warehouse management software. I was hired to develop and support an Android application and hardware solution for labour management, and desktop application development.

Prior Education

Macquarie University - *Master of Research (MRes) - Mathematics*

2016 - 2018 (2.5 years)

Awarded the RTPMRES Scholarship at the 2017 APA rate on a competitive basis to complete a 20000 word thesis on Applied Category Theory under the supervision of Professor Michael Johnson.

My thesis “Least Change View-Updating for Functorial View-Gets with Left Adjoints” explored Category Theoretic formulations of databases, null data and conditions for updatable views with desirable properties.

I was also awarded multiple stipends during the preliminary coursework year (2016) on a competitive basis.

University of Sydney - *Bachelor of Science (Bsc) - Mathematics and Computer Science*

2012 - 2015 (3.5 years)

Mathematics and Computer Science Majors including senior units on AI, operating systems internals, programming language theory, graphics and multimedia. Some notable projects include:

- A motion detection program that controls animation. This project was chosen to be shown to the next year's intake of students.

- A Haskell compiler for a simple programming language.

Publications

- Livson, O., Pritam, S., Prokopenko, M. (2025). Condorcet's Paradox as Non-Orientability.

- Livson, O., Prokopenko, M. (2025). Arrow's Impossibility Theorem as a Generalisation of Condorcet's Paradox.

- Livson, O., Prokopenko, M. (2025). Comparing and Contrasting Arrow's Impossibility Theorem and Gödel's Incompleteness Theorem.

- Nawaz, U., Deng, N., Livson, O., Mayoh C., Lau, LMS., Reddel, RR., Padhye B., Poulos, RC. (2025). OnCorr: A pan-cancer mRNA-protein correlation tool for precision oncology.

- Prokopenko, M., Davies, P., Harré, M., Heisler, M., Kuncic, Z., Lewis, G., Livson, O., Lizier, J., & Rosas, F. (2025). Biological arrow of time: emergence of tangled information hierarchies and self-modelling dynamics. Journal of Physics: Complexity, 6(1), 015006.

Teaching

- **Topological Social Choice Theory**, Chennai Mathematical Institute, Jan-Feb Session (2026)

  Developed and Delivered the unit's module on (Combinatorial) Social Choice Theory & Motivations for Topological Social Choice Theory.

- **COM2022/2922 Models of Computation**, University of Sydney, Semester 2 (2025)

  Delivered the unit's Turing Machines Module (developed under the supervision of Dr Sasha Rubin)

Additional Projects

- Development of https://ori-livson.com/ where I write tutorials on software engineering and expository content about my mathematics research.

- Keen interest in functional programming, esp. Haskell and Elm.

- Arduino development and basic electronics.

- Stock Fundamentals Analysis using Serverless Web Scraping