



modeller · mathematician · maker



[www.rileyclement.com](http://www.rileyclement.com)

[/rileyclement](https://www.linkedin.com/in/rileyclement)

Newcastle, Australia

## ABOUT ME

Self-motivated and independent learner equipped with a curious mind and a growth mindset. Driven to help those around them to learn and grow also.

Excels at applying creativity in thinking and to problem solving, while bringing strong analytical skills and reasoning to the table.

Enjoys making, whether that be prototypes, production tools, or a difference.

Possesses strong work ethic, operates with confidence and autonomy and pursues hidden leadership.

*References available on request*

## COMMUNITY

### NEWCASTLE CITY AFC

Licensee 2018 – present

Committee 2018

### CARRINGTON BOWLING CLUB

Director 2020 – present

Treasurer 2021 – present

### HUNTER DATA ANALYTICS

Co-organiser 2022 – present

## WORK EXPERIENCE

### OPTIMIZATION ENGINEER

Gurobi Optimization, Jan 2023 – present

### MODELLER

Hunter Valley Coal Chain Coordinator, Jan 2018 – Dec 2022

- Development of HVCCC's new Enhanced Whole of Coal Chain simulation model in AnyLogic and java [team project]
- Performed bespoke modelling and analysis for ad-hoc requests from stakeholders
- Implemented metaheuristics for synthetic data generation of simulation model inputs according to required specifications
- Led training in Python and "pandas ecosystem" for team members
- Architected project workflow for team based on git repositories and built tooling to facilitate
- Created suite of Jupyter notebooks for typical analysis and visualisations based on simulation outputs
- Designed and published proprietary Python packages for analysis, visualisation, and automation
- Implemented CI/CD and build pipelines in Azure DevOps
- Facilitated internal analyst working group meetups at HVCCC

### MODELLING ANALYST

Hunter Valley Coal Chain Coordinator, Aug 2017 – Dec 2017

Responsible for "what if" analysis using HVCCC's Whole of Coal Chain simulation model to assess the impact of potential changes to infrastructure, operations or contracts between stakeholders.

### OPERATIONS MANAGER & LICENSEE

FogHorn Brewhouse, Jan 2016 – Aug 2017

Incorporating the existing Venue Manager and Bar Manager roles, responsibilities included leading the Management and Front of House Teams, staffing, training, rostering, stock management, supplier negotiation, marketing and brand development, content generation, social media, events creation and promotion, functions management, creation and maintenance of sales reports and KPIs.

See further history at [www.linkedin.com/in/rileyclement/](https://www.linkedin.com/in/rileyclement/)

## OPEN SOURCE

### STAIRCASE

[www.staircase.dev](http://www.staircase.dev)

#### Creator and lead developer

The staircase package is an open source Python package which is used to model mathematical step functions. It is closely aligned to pandas and is designed to operate as part of the "pandas ecosystem". It makes converting raw, temporal data into time series easy and readable, and provides a rich variety of methods for analysis and aggregation.

### PISO

<https://piso.readthedocs.io>

#### Creator and lead developer

PISO (Pandas Interval Set Operations) is an open source Python package which provides methods for set operations, analytics, lookups and joins on pandas' interval based classes. It aims to simplify complex operations with fast implementations and fill the void until a time when similar functionality becomes available in pandas.

See [www.rileyclement.com](http://www.rileyclement.com) for further details on projects

## EXPERTISE

Operations Research Python

Data Science Optimisation

MILP Modelling Algorithms

Machine Learning Docker

Julia Java Metaheuristics

Simulation Data Analytics

AnyLogic Git CI/CD

Azure DevOps C++ SQL

## FORMAL EDUCATION

### Doctor of Philosophy (Mathematics)

University of Newcastle, 2009-2015

**Thesis title:** Mixed integer linear programming models for machine scheduling [↗](#)

**Supervisors:** Natasha Boland, Hamish Waterer

In the thesis several new MILP formulations for the single machine scheduling problem are proposed. These include a family of formulations which generalise the classical time indexed model. Other contributions in the thesis include strong formulations for sequencing models, with particular application to lot sizing problems. Implementations in this project were facilitated by Python, CPLEX and Gurobi.

- **Best Student Talk**, National Conference, The Australian Society for Operations Research, 2013.
- **Invited Speaker**, 21st International Symposium on Mathematical Programming, Berlin, 2012.
- **Best Student Talk**, Recent Advances Conference, The Australian Society for Operations Research, 2009.

### Bachelor of Mathematics (First Class Honours)

University of Newcastle, 2004-2008

**Thesis title:** A mobile machine scheduling problem with collision avoidance

**Supervisor:** Natasha Boland

The thesis was motivated by a real-world scheduling planning task unique to the Patrick container terminal in Port Botany. Several MILP models were developed, including a novel approach based on discrete events, capable of providing a detailed, efficient and collision free paths through space and time for 5 rail mounted gantry cranes. The models were implemented with SCIP and its C++ interface. A Tabu metaheuristic embedding a LP-based local search algorithm was also designed and implemented.

- **University Medal**
- Faculty Medal, Faculty of Science and Information Technology

### Bachelor of Computer Science

University of Newcastle, 2004-2007

- **Dean's Merit List**, Faculty of Engineering ('04, '05, '06, '07)
- **A.W. Roberts Medallion**, Faculty of Engineering ('04)
- **A.W. Roberts Award**, Faculty of Engineering ('05, '06, '07)

**I am an independent, self motivated learner who strives for life-long and informal study. Thankfully my curiosity and thirst for knowledge survived formal education!**