Ashley Wright
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Research Fellow with a PhD in flood forecasting and over 7 years of experience working as an environmental data scientist who delivers data driven modelling insights using mathematics and statistics.

KEY SKILLS

Programming
- **Python** – Enhanced the accuracy of electricity demand forecasting by 5.1% by training the Long Short-Term Memory (LSTM) and Multilayer Perceptron (MLP) neural network machine learning models using python.
- **SQL** – Cleaned, queried and manipulated millions of data points for geographic and drainage data sets in SQL.
- **MATLAB** – Improved flood forecasting capability by a consistent 7.1% by applying Markov Chain Monte Carlo (MCMC) simulation, optimisation, and data assimilation techniques.
- **R** – To analyse weather and climatology statistics.

Mathematics & Statistics
- Improved flood forecasting capability by 7.1% for a selection of Australian catchments using advanced mathematics and statistics modelling techniques that involved millions of data points.
- Applied accurate repeatable automated quality control procedures for data preparation and manipulation.

Data Storytelling
- **End-user meetings** - Delivered articulate presentations and reports to end-users, which hold operational to director level positions. End-users are adopting recommendations and utilization pathways are in development.
- Delivered 8 presentations and 3 reports to executives and senior executives which led to developing a recommended flood forecasting model in a national water forecasting framework.
- **Workshops** – Ran 5 collaborative and interactive workshops with research and government partners in Australia and Indonesia that enhanced awareness of flood mitigation measures.
- **Conference presentation** – Delivered 20 presentations on flood forecasting and modelling to conferences in 4 Australian cities and 3 international cities, including the American Geophysical Union conference which draws an attendance of 27,000 members from academia, government and private industry around the world.
- **Journal articles** – Advanced existing literature on flood forecasting area with publication of 4 articles (3 as lead author), in top tier journals, such as Water Resources Research. Contributor to an upcoming book chapter on the Intersection of data science and sustainability. Delivered more than 10 research reports to end-users.

Business Acumen
- **Strategic thinking** – Used critical thinking skills to deliver valuable research in a limited time frame, identify research gaps which add value, identify barriers to success, gain the necessary knowledge required to overcome barriers, execute on research plans, and communicate key findings.
- **Business areas and interconnection** – Demonstrated ability to work independently and as part of a collaborative team through involvement in research projects which iterated through outcomes based on feedback from multidisciplinary stakeholders from numerous organisations and business units.
- **Financial elements** – Involved in developing budgets for grant proposals, hardware, and conference expenses.
- **Leadership** - Utilised good leadership skills and effectively led and managed 3 research assistants, and supervised more than 8 honours students and organise and run more than 5 workshop sessions.

Technologies
- **Git/GitHub** - Managed project code.
- **High Performance Computing** - Reduced research and model development time by scheduling and profiling batch jobs on the MASSIVE research cluster and enabling automation of model evaluation and visualisation.

Monash University *Mar 2014 - Current*

Ranked 64th globally in the Times Higher Education World University Rankings 2021

Research Fellow - Flood Forecasting (Sep 2018 - Current)

Accountable for delivering methods to improve flood forecast skill using satellite data. Collaborate with team members to improve forecasting capability at large Australian government organisations to mitigate against the cost of flood damage which is $377 million per year.

- Improved forecasting skill by 7.1% by developing methods to optimise inputs.
- Engage with end-users and stakeholders to ensure research tasks are aligned with strategic priorities.
- Presented research on methodologies to optimise rainfall inputs used in flood forecasts in the USA.
- Collaborate with external agencies to incorporate models into a national water forecasting platform.
- Embraced fundamental agile concepts by iteratively improving research outcomes.
- Deliver flood forecasting model development guidelines to end-users.
- Develop and deliver lectures on modelling.
- Comparing the capability of machine learning models with process-based models to forecast floods.

Research Fellow - Flood Mitigation Strategy (Sep 2017 - Jan 2019)

Accountable for developing flood mitigation scenarios for the Indonesian city of Bogor's (population 1.2m). Our highly collaborative team delivered flexible roadmaps to aid the Indonesian city of Bogor in their water sensitive transition.

- Organised workshop sessions and used data science concepts to develop an interactive app to assess stakeholder receptivity towards flood mitigation options. Findings were presented in Italy.
- Led and managed 3 research assistants.

EARLIER CAREER

Research Scientist	Metropolitan Fire Brigade	Feb 2016 - May 2016
Teaching Associate	Monash University	Mar 2014 - Sep 2017
Civil Engineer	Breese Pitt Dixon	Jan 2012 - Mar 2014

QUALIFICATIONS

Qualification	Institute	Majors	Awards/Medals	Dates
Doctor of Philosophy	Monash University	Hydrology	Eric Laurenson	Mar 2014-Sep 2017
Bachelor of Engineering	Monash University	Civil Engineering	First class honours	Mar 2007- Nov 2012
Bachelor of Science	Monash University	Maths & Physics		Mar 2007 - Nov 2010

PORTFOLIO

Melbourne Datathon *2020*

The 2020 Melbourne Datathon focused on delivering insights into the pandemic using electricity consumption data.

Insights category (2020)

The hypothesis that electricity demand forecasting models can be improved by including variables which account for COVID-19 restrictions was explored and confirmed.

- Delivered insights and demonstrated data science skills through my website and delivering weekly blogs.
- In 28 days my blogs and website attracted 327 users for 633 sessions which averaged 4 minutes and 1 seconds. The bounce rate on my website was 63% in this period.
- Demonstrated that MLP neural networks provide superior performance when compared to other machine learning and statistical models.
- Demonstrated that accounting for COVID-19 restrictions can reduce forecast errors by 5.08%.