

# BLAKE DOWNWARD

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## PROFESSIONAL SUMMARY

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Long-term self-employed entrepreneur with a lean mindset for prototyping and validating ideas. I am a highly motivated self-starter with a commitment to continual development, and currently seeking to hone my diverse skill-set within an organisation that delivers innovative solutions and creates genuine value with its products and services.

## SKILLS & TOOLS

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Programming Languages:	Python, Shell, Bash, SQL, DAX
Data Formats & Markup:	JSON, YAML, XML, CSV, DB, Parquet, Markdown, LaTeX, HTML, CSS
IDE, Workflow, Version Control:	CLI, PyCharm, Jupyter Lab/Notebooks, Git, Weights & Biases, Vertex AI
Machine Learning Tools:	Keras, Tensorflow, PyTorch, Sci-Kit Learn, Numpy, Pandas, Scipy
Machine Learning Tasks:	Audio & Image Classification, Sound Event Detection, Keyword Spotting, Deploying Pre-Trained Models, Transfer Learning, Knowledge Distillation (Student-Teacher Model), Dataset Collection and Annotation
Machine Learning Data Types:	Structured/Tabular, Audio, Images, Text, Embeddings
Machine Learning Algorithms:	Regression, Random Forest, MLP, CNN, RNN, Clustering
Frontend/Dashboard:	Taipy, Streamlit, WordPress, Power BI, MS Excel
Hardware:	Raspberry Pi 4, Raspberry Pi Pico, Arduino Nano BLE Sense
Data Mining:	APIs, Selenium, BeautifulSoup, PDFs

## PUBLICATIONS & PROJECTS

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### **AeroSonicDB (YPAD-0523): Dataset for acoustic detection and classification of aircraft** *November 2023*

**Relevant tasks;** Data collection and labelling – identify and monitor aircraft with a software defined radio (SDR) and Python script, **capture audio** and label with information obtained directly from the aircraft, capture “background” audio samples when no aircraft present, **human verification and annotation** of onset/offset times with a **custom GUI** built with Python and Streamlit, **Data mining** to build a knowledge graph of aircraft attributes/features such as; Manufacturer, Model, Engine model, Engine type, Propeller model etc. Perform 5-fold **cross-validation** for reporting baseline results from three **binary classifiers** (Logistic regression, MLP and CNN).

**Summary;** 8.9 hours/625 aircraft samples (302 unique aircraft), 3.5 hours of background/silence samples, 6 hours of continual “environmental” recordings for testing and **evaluation of real-time applications**.

Dataset info and repository – <https://zenodo.org/records/10215080>

Dataset methodology and baseline results – <https://arxiv.org/abs/arXiv:2311.06368>

GitHub repo to download and reproduce results – <https://github.com/aerosonicdb/AeroSonicDB-YPAD0523>

### **AeroSonicDB (YPAD-0523): Version 2**

*(Yet to be released as an open-source dataset)*

**Relevant tasks;** As above, but the entire collection procedure was done on a **standalone device** (Raspberry Pi4). Integrated a **GPS module** to synchronise **time and location** of the device. Integration of the SDR to monitor aircraft positional info. Adapt a **microcontroller** to serve as a USB microphone. Use of “**Systemd**” to configure and control the chain of processes/scripts. Additionally, a new annotation GUI was developed with Taipy to display **spectrograms** and plot **model predictions** for new samples. Model predictions formed a basis for “**AI suggested**” onset and offset times, vastly speeding up the time required to verify and annotate audio samples.

**Summary;** 38 hours/2,443 aircraft samples (582 unique aircraft), 32 hours of background/silence audio.

Dataset info and repository – <https://zenodo.org/records/12775560>

## WORK EXPERIENCE

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### **Fox Limbry Holdings Pty Ltd – Adelaide**

*Managing Director*

*November 2016 – Current*

Relevant duties:

- Day to day management and administration of ecommerce business operations.
- Engaging and maintaining relationships with customers and suppliers.
- Development of Python scripts for automating cash-flow, accounting, analysis and reporting tasks.
- Responsible for procurement, importation and managing inventory.

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### **Shandong University – Jinan, China**

*Part-time Lecturer and Coordinator*

*August 2014 – November 2014*

Relevant duties:

- Delivering Corporate Finance lectures (in English) to 120+ students preparing to study overseas.
- Teaching Academic English as part of the same above bridging course.
- Assisted in coordinating the university's inaugural eMBA offering to foreign students.

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### **National Australia Bank – Darwin & Adelaide**

*Teller*

*October 2007 – January 2009*

Relevant duties:

- Daily balancing of draw and branch cash holdings.
- Ensuring precise data entry of transactions and safe handling of sensitive information.
- Customer service, complaints and sales.

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### **Gadens Lawyers/Fisher Jeffries Barristers & Solicitors – Adelaide**

*Mortgage Settlements Clerk*

*August 2006 – August 2007*

Relevant duties:

- Managing and maintaining strong relationships with corporate clients.
- Daily mortgage settlements, loan document preparation, loan disbursements and invoicing.
- Setting daily goals and tasks for offsideers.

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### **Parliament of South Australia/Legislative Council – Adelaide**

*Trainee Assistant to the Hon. David Ridgway*

*July 2005 – July 2006*

Relevant duties:

- Analysis and examination of bills, legislation and budget releases.
- Research for and drafting of parliamentary speeches and press-releases.
- General office administration and clerical duties.

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## EDUCATION

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### **Shandong University – Jinan, China**

*Masters in Economics (International Trade)*

*August 2012 – June 2014*

Relevant courses; Econometrics, Advanced Macroeconomics, Industrial Organisation, International Economics, Public Finance, International Financial Management.

Dissertation: *Vector Autoregressive Analysis of Exchange Rate Pass-Through in Australia*

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### **University of Adelaide – Adelaide, Australia**

*Bachelor of Commerce*

*February 2009 – July 2012*

Relevant courses; Econometrics, Business and Economic Statistics, Portfolio Theory and Management, Treasury and Financial Risk Management, Business Valuation, Commercial Law, Foundations of Entrepreneurship, Innovation and Creativity, Small and Family Business Perspectives, China Study Tour

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## CERTIFICATIONS

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### **Microsoft Power BI Data Analyst (Coursera)**

*July 2024*

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### **Databases and SQL for Data Science with Python – IBM (Coursera)**

*July 2024*

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### **Machine Learning Accelerator – Elite Data Science**

*August 2019*

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### **Cert. IV in Financial Services (Finance/Mortgage Broking) – Tafe SA**

*August 2007*