William Matthews DPhil MEng

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EDUCATION

University of Oxford, University College October 2019 - December 2023
DPhil *Oxford, UK*

- Silicon Photomultipliers as Optical Wireless Receivers in Ambient Light. Supervisor Prof. Steve Collins.
- Published a total of thirteen papers, with more in draft. Presented at three conferences.
- Achieved world-record data-rates using a SiPM as a receiver with On-Off Keying and OFDM.
- Created a high-performance Monte-Carlo simulator of SiPMs in C++.
- Invented and optimised novel optics for solid-state solid angle filtering.

University of Oxford, University College Matriculated 2015 - Graduated 2019
First Class MEng Engineering Science *Oxford, UK*

- Mathematics and Statistics-dense course. Specialisms in Information (ML, Signal Processing, Communications), Robotics (Control, Planning, Machine Vision), Math, Plasmonics and Semiconductors.
- Earned a Scholarship for First Class performance.
- 3rd Year Projects: 'Control of an Ammonia-Based ESS' & 'Optimal FIR Filter Generation'.
- 4th Year Project: 'Graph Modulation: Ultra-efficient Communication and Storage for 6G Systems'. Supervised by Prof. Justin Coon.

EXPERIENCE

Avos Ltd. July 2023 - Present
Software Engineer *Cambridge, UK*

- Startup in stealth mode.
- Full stack software Engineer with focus on backend and data engineering.
- Wrote a significant amount of Golang, Python (for R&D), SQL, and React.
- Core responsibilities in data cleaning, knowledge creation, curation, and recall.
- Developed entire pipelines for data ingestion, prompt construction, LLM output processing and more.
- Notable experience with various LLM APIs, prompt engineering, and data pipelines.
- Experience with embedding models, vector databases, search engines, and RAG.
- Became the go-to person for all matters NLP and ML, and led the 'AI team' in the company.
- Read multiple papers a week and implemented research into the company's products where appropriate.
- Formed a close working relationship with the CEO and CTO, and gave guidance on the company's direction with respect to NLP.
- Wrote recommendation systems to surface relevant information custom to each user.

Oxford University Racing May 2019 - September 2020
Chief Software & Electrical Engineer *Oxford, UK*

- Managed a team of ten people. Led the development for key electric vehicle systems.
- Responsible for all low voltage electrical systems and software on the vehicle.
- Developed a continuous integration system for vehicle control unit software, among other circuits.

PrOXisense Ltd. July 2018 - September 2018, July 2019 - April 2020
Intern, Consulting Software & Electrical Engineer *Harwell, UK*

- Solely responsible for creating critical software to process sensor data, as well as processing raw signals for customer demonstrations, sensor calibration and internal R&D use.
- Created a custom thermal simulation package to guide future thermal product sensor development.
- Using Kalman filters, improved sensor accuracy and precision for blade tip timing and clearance measurement by a factor of 200 through my own initiative.
- Processed and presented results to clients, leading towards two new contracts.

TECHNICAL STRENGTHS AND CAPABILITIES

Languages	Go, C/C++, Python 3, MATLAB, SQL, bash, PHP, Type/JavaScript
Markup	HTML, CSS, LaTeX
Workflow	zshell, tmux, vim, git, ssh, VSCode
Software	React, Simulink, KiCAD, FreeCAD, Solidworks, Wireshark, GIMP
Methods	Discrete and Continuous Signal Processing, Machine Learning, Optimisation, Statistics, Data Visualisation

Comfortable with Torch, Keras and Tensorflow. Wrote an autograd from the ground up.
Daily-drives GNU/Linux. Experienced at designing, building and testing RF circuit boards, 3D printing.

HOBBIES AND INTERESTS

Running, Fishing, Squash, OpenStreetMap Contributor.
I enjoy fiddling with my blog (when I can find the time), and working on various software projects. I have recently started to contribute to the open source community, and have a few small projects on GitHub. Attempting research into ML in my own time, with a personal goal to publish a paper in the field within two years.

REFERENCES AND ADDITIONAL INFORMATION

References available on request. Additional information available on https://willmatthews.xyz.