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# William Matthews

DPhil MEng

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## SUMMARY AND OBJECTIVES

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I am a curious and creative problem solver with a strong background in engineering, photonics, and software development, having earned both an MEng and DPhil from the University of Oxford. I aspire to become an expert in any field I apply myself to and am passionate about building high-performance, scalable systems. I enjoy building systems through a combination of robust software engineering practices and more exploratory research and development.

For my next role I seek a challenging and rewarding position where I can solve interesting problems and contribute to the development of sophisticated systems. I am eager to join a forward-thinking, technology-driven organisation where I can grow, learn, and contribute meaningfully alongside industry leaders.

As a team player and a lifelong learner, I strive to make a lasting positive impact wherever I work.

## EDUCATION

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### 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 one 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.
- 3<sup>rd</sup> Year Projects: 'Control of an Ammonia-Based ESS' & 'Optimal FIR Filter Generation'.
- 4<sup>th</sup> Year Project: 'Graph Modulation: Ultra-efficient Communication and Storage for 6G Systems'. Supervised by Prof. Justin Coon.
- Created an 8 bit CPU with a team of two in Cadence Virtuoso.

## EXPERIENCE

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### Avos Ltd.

July 2023 - Present

*Software Engineer*

*Cambridge, UK*

- Product-driven startup in business communications.
- Full stack software engineer with a focus on backend and R&D.
- Using Golang, Python (for R&D), SQL and React.
- Core responsibilities in NLP (mostly with LLMs), data curation, and retrieval.
- Experienced in text embedding, vector databases, search engines, and RAG.
- Developed entire pipelines for data ingestion, prompt construction, LLM output processing, and more.
- Became the go-to person for NLP and ML, and led the direction of the use of AI within the product.
- Read multiple papers a week and implemented research into the company's products where appropriate.
- Wrote recommendation systems to surface relevant information for each user.

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**Oxford University Racing**  
*Chief Software & Electrical Engineer*

May 2019 - September 2020  
*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.

**ProXisense Ltd.**  
*Intern, Consulting Software & Electrical Engineer*

July 2018 - September 2018, July 2019 - April 2020  
*Harwell, UK*

- R&D-driven startup in gas turbine sensors.
- 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 thermal simulation program 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

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

Comfortable with Torch, Keras and Tensorflow.

Daily-drives GNU/Linux. Experienced at designing, building and testing RF circuit boards, 3D printing.

## HOBBIES AND INTERESTS

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Running, Fishing, Squash, OpenStreetMap Contributor.

I enjoy fiddling with my blog (when I can find the time), and working on various software projects. I am a collaborator on the [github.com/liushuangli/go-anthropic](https://github.com/liushuangli/go-anthropic) Go module and contribute to open source often. Researching ML in my own time, with a personal goal to publish a paper in the field within the next three years.

## REFERENCES AND ADDITIONAL INFORMATION

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