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William Hampshire

Physics undergraduate at the University of Sheffield. Skilled in applying programming skills, with a particular talent for physics problems requiring multi-disciplinary knowledge, demonstrated in projects. Keen to further develop applying theoretical principles to reach practical solutions, and leveraging data science to gain valuable insights. Equipped to deliver solutions in a research setting, as learned on placement, using physics and practical skills complimented by data science and programming.

Education

- 2021 - present **BSc Physics with Year in Industry**, *University of Sheffield*, *Predicted First Class*
- 2019 - 2021 **A levels**, *The Sixth Form College*, Colchester, *Physics (A) Maths (A) Electronics (A) Chemistry (A)*
- 2014 - 2019 **9 GCSEs, 1 BTEC**, *Maltings Academy*, *Average 7.6 with 9 in Physics. Dist* in Business.*

Employment

2023 - 2024 **Design Physicist Intern**, *AMETEK Land Instruments International*

- Advanced R&D, using radiometric theory and simulation to prototype and diagnose Cassegrain optical devices. For example, reducing glare 10% using baffled surfaces.
- Crafted bespoke integrating spheres and hot plates for uniform (to <5%K) thermal imaging, requiring practical ability to achieve theoretical goals. Used across the globe for extending product lifespan.
- Analysed and visualised 40,000+ internal data files, resulting in massive quality control improvements, enabling delivery and high quality of 7 figure orders.

Overall, impactful contributions made to the Physics team at Land, world leaders in non-contact temperature measurement solutions, furthering innovation and performance.

2022 - present **Volunteering**, *Student Staff Committee, University of Sheffield*

Volunteering for the Student Staff Committee, facilitating feedback from students to lecturers & faculty. Demands clear and effective communication, and good interpersonal understanding.

Projects

Subwavelength Waveguide Simulation using Rigorous Coupled Wave Analysis (academic)

- Undergraduate computational research project. Simulation of 2D nanophotonic subwavelength waveguides, with Sasha Tartakovskii PhD research group, University of Sheffield.
- Strong Python ability leveraged to automate exploration and characterisation, using Stamford's S4 RCWA package.
- Saved 90%+ manual hours by looping parameter space, and filtering by physical features >100nm.

Calculation of Radiance-Temperature Relationship for Digital Radiometric Optical Devices

- Created C# app that calculates the Radiance Temperature relationship for a given wavelength band, temperature range, and filter. 10x faster than Python predecessor.
- Uses the Sakuma Hattori Planck 3 approximation to calculate thermal radiation.
- SQLite database management for stackable filters, for simulating non-transparent beam path.

LSTM & Dense Network Machine Learning of Motor Activity Predicting MADRS Score

- Neural network trained with LSTM and Dense layers, that predicts results to <1% accuracy, with 70/30 test split.
- Uses activity from an Actigraph watch, meaning there is large room for expansion (currently 23 sets).

Further details and additional projects available on website.

Technical and Personal skills

- **Programming Languages:** Python (numpy, pandas, seaborn, sklearn...), JavaScript/HTML/CSS. Basic proficiency in C, C#, Matlab, VBA.
- **Industry Software:** Excel (& macros), Tableau, Autodesk Fusion 360, Adobe CS/CC.
- **General Business Skills:** Documentation and presentation, Understanding of business aims and objectives, Works productively in a team (see volunteering, internship).

Interests and extra-curricular activity

- Data Analysis & ML projects; investigate interesting/useful datasets (e.g. WBOD, Kaggle) with Python.
- Electronic projects, using Arduino, Raspberry Pi; RGB LED control powered by MOSFETs.
- 3D Printing, CAD, RC hobbyist; using Fusion 360 for 3D printing and modelling projects, building racing drones.
- Music & sports; play Saxophone, Piano and Bass guitar. Toured Germany with jazz orchestra. Play field hockey and squash.