Marek Józef Michałowski

3rd Year MMath&Phys (Honours)
Mathematics and Physics

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Personal Profile

I am currently most interested in the newest developments in the ML world. On the mathematical side of my degree, I focus on computability, efficient formulation of convex problems and application of rigorous mathematical techniques to real-world scenarios. In physics, my main interests lie in quantum mechanics, especially in statistical physics. Over the course of my life, I have lived in Poland, Singapore and the UK, which gives me a unique appreciation of the diversity of ideas between different cultures.

Core Skills

- Python - NumPy, SciPy, Pandas
- Excellent problem solving
- Scientific writing and LaTeX
- Object-oriented programming
- Laboratory analysis
- Fluency in English and Polish
- Modeling in Matlab
- Machine Learning - Keras, TF
- MS Office Suite

Education

09/2019 – 06/2022 **3rd Year Student in MMath&Phys (Hons) Mathematics and Physics**
The University of Manchester, UK

Summary

Well on-track to obtain a First-Class Honours degree. Main focus on computation, convex optimisation and application of mathematical modelling. Physics courses include *Advanced Quantum Mechanics*, *Particle Physics* and *Electrodynamics*

Achievements

- Excellent performance in laboratory work. The routine always heavily employed use of Python and its libraries like SciPy, pandas, NumPy etc.
- Formed a group that placed 13th in the PLANCKS 2022 UK preliminaries (a theoretical physics international competition) out of almost 90 groups.
- Scored highest in the year in *Problem Solving in Matlab* course (see QR). Scored in the top for *Programming in Python* course.
- Was awarded the Physics Success Award for demonstrating excellence in the entrance exams.

08/2017 – 06/2019 **Student of International Baccalaureate Bilingual Diploma**
Canadian International School in Singapore

Summary

Obtained a total mark of 41/45, placing in the top 7% of candidates worldwide. Results include 7/7 in higher level mathematics, 7/7 in higher level physics, 6/7 in higher level chemistry, 6/7 in standard level English and a mark of B for an extended essay in mathematics.

Achievements

- High Honour Roll Award.
- Theory of Knowledge Student of the Year 2019 Award.

Relevant Experience

11/2020 – 12/2020 **INTErnational REmote Student Training - EqDb manual preparation**
Joint Institute for Nuclear Research (JINR) in Dubna

- Using LaTeX, produced a professional manual for the new, ORACLE-based equipment database used in the currently being built particle accelerator - Nuclotron-based Ion Collider Facility in Dubna.
- Conducted the work remotely in close cooperation with another student studying chemical engineering and under the supervision of a JINR staff member from the Warsaw University of Technology.

01/2018 – 02/2019 **Science Communicator Volunteer**
Science Centre in Singapore

- Performed and explained about 15 experiments from different scientific disciplines to the visiting public.
- Honed efficient communication and presentation skills.

Positions of Responsibility

09/2020 – 06/2022 **Peer-assisted Study Sessions Leader**
The University of Manchester

- Guided a group of around 10 physics freshmen through the first year of study in cooperation with another co-leader.
- Organised activities which focused on developing a deeper understanding of the studied material through guided discussions and on cultivating mental and physical health.
- As a result of this role, soon likely to receive the Associate Fellow in Higher Education title.

Projects and Interests

- Using the knowledge from *Convex Optimisation* course and own research, currently trying to create a neural network from scratch.
- Exploring the ideas behind AI alignment problem, as applicable both for simple ML models and potential general intelligence in the future.
- *Mindscape* podcast which explores currently taking place research on the boundaries of disciplines.