Iwona Hawryluk, PhD

Contact

Email: iwo.hawryluk@gmail.com
WWW: https://ihawryluk.github.io/
Git: https://github.com/ihawryluk

Personal Profile

Highly skilled data scientist with a PhD specialising in the development of mathematical and statistical models. With extensive experience in applying machine learning and deep learning techniques to diverse data types, including medical data, satellite images, and audio files, I excel in utilising modern statistical methods to solve real-life problems. My career spans roles as a data scientist and cybersecurity researcher in the industry, where I have demonstrated a strong ability to drive data-driven decision-making and innovative solutions. Passionate about leveraging my expertise to contribute to impactful projects, I thrive in multidisciplinary and collaborative environments.

Core Skills

Programming:	Python, C++, R, Matlab, Mathematica, Bash, Git, SQL, Spark
Libraries:	PyTorch, Tensorflow, Pandas, scikit-learn, NumPy, Matplotlib, Stan, NumPyro, SciPy
Interests:	Machine Learning, Deep Learning, Data Science, Probabilistic Programming, Bayesian Statistics, Mathematical Modelling, Computer Vision

Research Experience

May 2024 - present, ongoing, UK
Postdoctoral Research Associate at Imperial College London
- research involves working on a Deep Learning modelling for speech
- finetuning and running language classification models on audio files

Jan 2021 - May 2021, 5 months, UK
Researcher in the Imperial College London COVID-19 response team
- undertook a studies break to support the research on COVID-19 pandemic in Brazil and in the UK.
- worked under very tight timelines for deliverables as my methods were feeding into big models informing governments
- collaborated closely with the other members of the team to ensure timely delivery
- delivered data and machine learning models necessary for pandemic spread estimation

Data Science Experience

June 2022 - Sept 2022, 3 months, remote
Data Science Research Intern at Securonix,
- quickly got up to speed with problems occurring in cybersecurity, field new to me
- overcame challenges posed by big, unstructured data sets hosted on AWS servers
- delivered a new Bayesian statistical model for anomalous behaviour detection, which I also wrote up as a preprint and presented at an international AI conference
- the outcomes opened up a new direction for the team to explore in the future

Apr 2018 - June 2019, 14 months, Ireland
Data Scientist at Creme Global
- Developing new and existing statistical methods, performing data analyses
- using in-house software and bespoke algorithms, I delivered complex data analysis reports to the clients, taking a proactive approach to solving their problems
- took full ownership and leadership over the projects, working closely with the clients
- wrote project proposals and software specifications and worked with the Software Engineering team to deliver desired products to the clients

Dec 2017 - Apr 2018, 4 months, Ireland
Data Scientist at LetsGetChecked
- analysis of clinical numeric and text data
- market research, marketing data analyses

June - Sept 2017, 4 months, Finland
Research Scientist at VTT Technical Research Centre of Finland
- clinical data analysis, machine learning models, medical image processing
- development of a machine learning model for heart attack survival prediction, collaborating with medical doctors at a hospital

Education

2020-2024 PhD in Epidemiology of Infectious Diseases
Imperial College London, UK
Thesis: "Statistical methods for characterising the severity of an emerging pathogen: case studies of the COVID-19 pandemic"
- developed and implemented several new statistical methods and models for modelling the COVID-19 pandemic
- the methods were peer-reviewed and published before I finished my PhD
- ensured reproducibility of the code and deployment of models on external servers
- overcame a lot of computational challenges with training complex models
- self-learned statistical methods and probabilistic programming libraries

2019-2020 MRes in Epidemiology of Infectious Diseases
Imperial College London, UK

2015-2017 MSc in Applied Mathematics
University of Helsinki, Finland

2012-2015 BSc in Mathematics
University of Wroclaw, Poland

Scholarships and Awards

London, 2019-2024 Medical Research Council Fund, Imperial College London
Funding for the 1+3 PhD training programme in Epidemiology and Control of Infectious Disease

London, 2020 Prize for Excellence in Research award for outstanding achievements in the MRes course

Helsinki, 2017 The Mathematics and Science Fund award for outstanding achievements in studies

Wroclaw, 2012-2015 University's Principal Scholarship for most talented students

Wroclaw, 2012-2015 "Mathematics without borders" scholarship for most talented students

Talks and posters

May 2024 Machine Learning and Global Health network meetup (talk)

May 2023 ICLR ML for Global Health workshop (poster)

Feb 2023 AAAI Artificial Intelligence for Cybersecurity workshop (talk)

Nov 2022 American Society of Tropical Medicine and Hygiene conference (poster)

Nov 2022 Science: Polish Perspectives 2022 conference (poster)

Nov 2022 European Space Agency: ML for Earth Observation workshop (poster)

July 2021 Uncertainty in Artificial Intelligence conference (talk)

May 2021 Science: Polish Perspectives 2021 conference (talk)

Selected publications

1. I. Hawryluk et al. Inference of COVID-19 epidemiological distributions from Brazilian hospital data. *Journal of The Royal Society Interface*, 17(172):20200596, 2020. URL https://doi.org/10.1098/rsif.2020.0596
2. I. Hawryluk et al. Gaussian Process Nowcasting: Application to COVID-19 Mortality Reporting. *UAI 2021. PLMR*, 2021. URL https://proceedings.mlr.press/v161/hawryluk21a.html
3. I. Hawryluk et al. Application of referenced thermodynamic integration to Bayesian model selection. *PLOS ONE*, 18(8):1–16, 08 2023. URL https://doi.org/10.1371/journal.pone.0289889
4. I. Hawryluk et al. Peer-group Behaviour Analytics of Windows Authentications Events Using Hierarchical Bayesian Modelling. *arXiv preprint*, 2022. URL https://arxiv.org/abs/2209.09769
5. A. Brizzi, C. Whittaker, L. M. Servo, I. Hawryluk, et al. Spatial and temporal fluctuations in COVID-19 fatality rates in Brazilian hospitals. *Nature Medicine*, 28, 2022. URL https://doi.org/10.1038/s41591-022-01807-1
6. H. Wilde, T. Mellan, I. Hawryluk, et al. The association between mechanical ventilator compatible bed occupancy and mortality risk in intensive care patients with COVID-19: a national retrospective cohort study. *BMC Medicine*, 2021. URL https://doi.org/10.1186/s12916-021-02096-0