

Antje Barbara Metlzer

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EDUCATION

- Oct. 2019 – July 2023 **PhD Deep Learning, Remote Sensing and Inequalities in Cities** IMPERIAL COLLEGE LONDON, UK
- Thesis:** Measuring and analysing urban development in Sub-Saharan Africa with very high-resolution satellite imagery and unsupervised deep learning techniques.
- Funded by the **President's PhD Scholarship** (prestigious scholarship for students consistently scoring in the top 5-10%.)
- Supervised by Prof. Majid Ezzati, Dr. Viktoriia Sharmanska, and Dr. Wenjia Bai.
- Part of the Global Environmental Health Research Group and Pathways to Equitable Healthy Cities collaboration.
- Sep. 2018 – Sep. 2019 **MSc Health Data Analytics and Machine Learning** (first class honours) IMPERIAL COLLEGE LONDON, UK
- Thesis:** “Measuring Social and Health Inequalities using Machine Learning and Object Detection with Street View Imagery“ (84%); **Best dissertation award.**
- Modules included: Statistics, Machine Learning, Data Analytics and Management, Translational Data Sciences, and Computational Epidemiology.
- Sep. 2014 – Jun. 2017 **BASc Physics (major)** (first class honours) UNIVERSITY COLLEGE LONDON, UK
- Bachelor of Arts and Sciences
- Modules included: Mathematical Methods, Calculus, Quantitative Methods, Data Visualisation, Game Theory, Mechanics, Modern Physics, Environmental Physics, and Engineering Physics.
- Mandarin (Level B) and English Literature (minor)
- 2004 – 2013 **Matura** at Bundesgymnasium Gallusstrasse BREGENZ, AUSTRIA
- Secondary state school with a focus on modern languages; Matura grade point average (GPA): 1.0 (A*).

WORK EXPERIENCE

- Sep. 2020 - Jun. 2023 **Graduate Teaching Assistant** Imperial College London LONDON, UK
- Developed teaching material for tutorials and supervised students in their research projects;
- Courses: Machine Learning (MSc): 2020-2023; and Population Health Analytics (MSc): 2021-2023
- Dec. 2019 **Data Science Study Group** Alan Turing Institute and WWF LONDON, UK
- Applied natural language processing (NLP) and machine learning techniques to detect news articles that report emerging threats to WWF world heritage sites and key protected areas.
- Dec. 2018 - Apr. 2019 **Data Science Elite Team** ICDSS LONDON, UK
- Competitive data science projects together with industry partners for selected scholars.
- Applied Google BERT model to news datasets to analyse sentiment for a fintech company.
- Nov. 2017 – Jun. 2018 **Research Data Analyst** indoo.rs (now part of Esri) VIENNA, AUSTRIA
- Deepened understanding of fundamental data analysis tools, as well as advanced analytics, specifically clustering methods and network analysis.
- Developed own algorithms for advanced trajectory analytics and visualisations, with findings published in a paper.
- Jun. 2016 – Aug. 2016 **Project Management Trainee** Zumtobel Group HONG KONG

Jan. 2016 – May. 2017

Journalist Engineering Inspirations (uclengins.org)

LONDON, UK

Wrote articles for the UCL publication 'ENGins' with focus on UAV/drones and (cyber) security news; e.g. www.engins.org/2016/06/24/blind-firing

SOFTWARE AND LANGUAGES

Operating systems: Linux, Windows and MAC OS X, Raspbian
Advanced **MS Office** (Word, Excel, PP) skills

Advanced **Python** (6+ yrs experience): strong knowledge of data science and ML libraries like pandas, numpy, SciPy, NetworkX, scikit-learn, PyTorch, TensorFlow, Pillow, OpenCV etc.; Intermediate **R**, Intermediate **SQL**, Intermediate **HTML** and **CSS** (CodeFirst Girls, Web development certificate); Basic **JavaScript** and **C++**

Geospatial analysis: **ArcGIS**, **QGIS**, **GDAL** as well as Python libraries like GeoPandas, shapely, rasterio, PySAL, rasterstats etc.

Mother tongue **German**, fluent **English** (CAE C2 – Certificate in Advanced English), advanced **French** (DELF B1 – Diplôme d'Etudes en langue Française), conversational **Mandarin**

HONOURS

2021

Award for Best Poster Presentation

LONDON, UK

at the Medical Research Council Centre Joint Training Programme Meeting 2021.

2019-2023

President's Scholarship

IMPERIAL COLLEGE LONDON, UK

2019

Best Dissertation Award (MSc thesis)

IMPERIAL COLLEGE LONDON, UK

2018

FEMtech scholarship

AUSTRIAN RESEARCH PROMOTION AGENCY (FFG)

2016, 2017, 2018

EFA Scholarship

EUROPEAN FORUM ALPBACH

Full-time scholarship to participate in the EFA, a platform for politicians and scholars to discuss the future of Europe and its development in Sciences, Politics, Economics, and beyond.

SELECTED PEER-REVIEWED PUBLICATIONS

1. **A B Metzler**, R Nathvani, W Bai et. al. Unsupervised deep clustering of high-resolution satellite imagery for multidimensional city environments: comparing city-specific and multi-city approaches in Sub-Saharan Africa. *In review*, 2023.
2. **A B Metzler**, R Nathvani, V Sharmanska et. al. Phenotyping urban built and natural environments with high-resolution satellite images and unsupervised deep learning. In *Science of The Total Environment*, 2023.
3. E Muller, E Gemmell, I Choudhury, R Nathvani, **A B Metzler** et. al.. Mapping City-Wide Perceptions of Neighbourhood Quality using Street View Images. In <https://arxiv.org/abs/2211.12139>. 2022.
4. R Nathvani, S N Clark, E Muller, A S Alli, J E Bennett, J Nimo, J B Moses, S Baah, **A B Metzler** et. al.. Characterization of urban environment and activity across space and time using street images and deep learning in Accra. In *Nature, Scientific Reports, Smart Cities special*, 2022.
5. T Burgess, **B Metzler**, A Ettlinger, et al.. Geometric Constraint Model and Mobility Graphs for Building Utilization Intelligence. In *International Conference on Indoor Positioning and Indoor Navigation (IPIN)*, 2018.

SELECTED PRESENTATIONS

1. **A B Metzler**, R Nathvani, V Sharmanska et. al.. Capturing and characterizing the urban fabric of sub-Saharan Africa with very high-resolution satellite imagery and unsupervised machine learning. In *American Association of Geographers (AAG) Annual Meeting*, 2023.
2. **A B Metzler**, R Nathvani, V Sharmanska et. al.. Characterization of urban built and natural environments with high-resolution satellite images and unsupervised deep learning. In *Annual Conference of the International Society for Environmental Epidemiology (ISEE)*, 2022.
3. R Nathvani, S N Clark, E Muller, A S Alli, J E Bennett, J Nimo, J B Moses, S Baah, **A B Metzler** et. al.. Spatiotemporal characterization of urban activity and environment with imagery and deep learning. In *Annual Conference of the International Society for Environmental Epidemiology (ISEE)*, 2021.