# Alexandru Buburuzan

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## EDUCATION

**The University of Manchester** Sep 2021 – Jun 2025 | Manchester, UK

*BSc(Hons) Artificial Intelligence with Industrial Experience*

AI ML Computer Vision

- 1st year: **90%** average grade, **ranked 2nd/486** first-year CS students, **Golden Anniversary and Netcraft awards.**
- 2nd year: **86%** average grade (First-Class Honours), attending Prof. Tim Cootes' Computer Vision reading group.
- Summer schools: **Oxford ML** (2023), **Cambridge AI in healthcare** (2022), **EEML** (2022).
- Selected courses: Intro to AI, Machine Learning, Probability 2, Knowledge-Based AI, Visual Computing, Data Science, Logic, Algorithms and Data Structures, Computation, Programming (Python, C, C++, Prolog, Haskell).

**Grigore Moisil Theoretical High School** Sep 2017 – Jun 2021 | Timisoara, Romania

*Computer Science and Mathematics*

Algorithms Data Structures Mathematics

- **Valedictorian,** Romanian Baccalaureate with 10/10 in Mathematics and in Computer Science.
- National Olympiad in Mathematics (**Bronze** in 2021) and Informatics (2021, **qualified 9th** in 2020, **Bronze** in 2018).
- **Quantum Computing** course organized by IBM (credential), **English C1** (IELTS band 8 credential)

## EXPERIENCE

**FiveAI** – acquired by **Bosch** Jun 2023 – Jun 2024 | Cambridge, UK

*Research Engineer Intern*

Autonomous Driving Multimodality Explainability PyTorch

- Published a paper [1] on **multimodal fusion** for 3D object detection in autonomous driving.
- Implented **explainability techniques**, demonstrating enhanced complementarity between modalities.

**Rayscape** Jul 2021 – Jul 2023 | remote

*Research Engineer*

Medical imaging Domain generalization Segmentation PyTorch

- Reduced the out-of-domain gap in multi-label chest X-ray classification by 32% for two covariate shifts [2].
- Improved the metrics of a **nodule malignancy classification** algorithm by 3% using **Vision Transformers.**
- Developed a **CE-marked algorithm** for segmenting nodules on lung CT scans that has helped **radiologists from over 100 medical institutions** fare better at diagnosing lung cancer by providing precise measurements.
- Implemented a segmentation refinement mechanism that **halved the previous error** of the predicted measurements.

**Rayscape** Mar 2020 – Sep 2020 | Timisoara, Romania

*Machine Learning Intern*

Medical imaging Classification Frame aggregation PyTorch

- Developed an algorithm for **detecting intracranial haemorrhages** which **sped up the triaging process.**
- Built models for lung segmentation, pathology classification and foreign objects detection on chest X-ray scans.

## PROJECTS

**Manchester University Data Science Society** Jun 2022 - Present

- As a **workshops executive** , I am teaching an introductory course on Medical Image Analysis using CNNs.
- Prepared a Jupyter Notebook consisting of a PyTorch pipeline used to train an organ classification model.

**Citadel European Datathon** Apr 2023

- Analysed 1.8 million traffic stops in Philadelphia to identify racial disparities in policing, using Pandas and Plotly.

**SaferWalk** – first-year team project Oct 2021 - May 2022

- Improved Flask API throughput by 4x, predicting safer pedestrian routes, using an advanced implementation of A*.

**Climate Hack.AI** – ranked 6th/25 top universities in UK, US and Canada. Jan 2022 – March 2022

- Developed a **video generation** model for predicting solar photovoltaic power production using satellite images.

## PUBLICATIONS

[1] James Gunn, Zygmunt Lenyk, Anuj Sharma, Andrea Donati, **Alexandru Buburuzan**, John Redford, Romain Mueller, "Lift-Attend-Splat: Bird's-eye-view camera-lidar fusion using transformers" in *arXiv preprint arXiv:2312.14919*, 2023.

[2] Bogdan Bercean*, **Alexandru Buburuzan***, Andreea Birhala, Cristian Avramescu, Andrei Tenescu, Marius Marcu, "Breaking Down Covariate Shift on Pneumothorax Chest X-Ray Classification" in *International Workshop on Uncertainty for Safe Utilization of Machine Learning in Medical Imaging (MICCAI UNSURE)*, 2023.

[3] Bogdan Bercean, Andreea Birhala, Paula Ardelean, Ioana Barbulescu, Marius Benta, Cristina Rasadean, Dan Costachescu, Cristian Avramescu, Andrei Tenescu, Stefan Iarca, **Alexandru Buburuzan**, Marius Marcu, Florin Birsasteanu, "Evidence of a cognitive bias in the quantification of COVID-19 with CT: an artificial intelligence randomised clinical trial" in *Nature Scientific Reports*, 2023.

*Equal contribution.