# Alexandru Buburuzan

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#### **EDUCATION**

#### The University of Manchester

Sep 2021 – Jun 2025 | Manchester, UK

Machine Learning Computer Vision

BSc(Hons) Artificial Intelligence with Industrial Experience

- 1st year: 90% grade, ranked 2nd/486 first-year CS students, Golden Anniversary and Netcraft awards.
- 2<sup>nd</sup> year: 86% grade (First-Class Honours), attending <u>Prof. Tim Cootes'</u> Computer Vision reading group.
- Summer schools: Oxford ML (2023), Cambridge AI in healthcare (2022), EEML (2022).
- Selected courses: Intro to AI, Machine Learning, Probability, Knowledge-Based AI, Computation, Visual Computing.

## Grigore Moisil Theoretical High School

Sep 2017 – Jun 2021 | Timisoara, Romania Algorithms Data Structures Mathematics

Computer Science and Mathematics

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

#### **EMPLOYMENT**

## FiveAI - acquired by Bosch

Jun 2023 – Jun 2024 | Cambridge, UK

Research Engineer Intern

• 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, part-time

Research Engineer

Medical imaging Domain generalization Segmentation PyTorch

Autonomous Driving Multimodality Explainability 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 Medical imaging Classification PyTorch

Machine Learning Intern

- 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 <u>course</u> 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 Plotly and Pandas.

## SaferWalk - first-year team project

Oct 2021 - May 2022

• Improved Flask API throughput by 4x, predicting safer pedestrian routes, using an optimised implementation of A\*.

Climate Hack.AI – ranked 6<sup>th</sup>/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.

<sup>\*</sup>Equal contribution.