Otniel-Bogdan Mercea
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Education

- **International Max Planck Research School for Intelligent Systems** — Tübingen, Germany
  PhD in Computer Science — *May 2021 -*
  - **PhD student**: in the **EML** and **AVG** groups working with Prof. Zeynep Akata and Prof. Andreas Geiger.
  - **PhD Topics**: multi-modal learning, zero-shot learning, explainability in self-driving cars.
  - **Responsibilities**: Maintaining and improving the **EML group website**.
- **The University of Edinburgh** — Edinburgh, Scotland
  MSc in Artificial Intelligence; Distinction (Overall 76%) — *Sept. 2019 - Aug. 2020*
  - **MSc thesis**: "What Neural Networks can not learn?". **Supervisor**: Amos Storkey. Grade - 77% (Distinction)
  - **Relevant Courses**: Accelerated Natural Language Processing; Algorithmic Game Theory and Applications; Machine Learning and Pattern Recognition; Machine Learning Practical; Natural Language Understanding, Generation and Machine Translation; Reinforcement Learning.
- **Politehnica University of Timisoara** — Timisoara, Romania
  BSc in Computers and Information Technology; Top 3% (Overall 9.70/10) — *Oct. 2015 - June 2019*
  - **Bachelor Thesis**: "HybridAlpha-Reinforcement Learning on Resource-Constrained Systems". **Supervisor**: Calin-Adrian Popa. Grade - 10/10
  - **Relevant Courses**: Data Structures and Algorithms; Object Oriented Design; Foundations Of Software Engineering; Linear Algebra, Probabilities and Statistics; Computer Security; Operating systems; Bases of Artificial Intelligence.

Experience

- **Everseen** — Timisoara, Romania
  Machine Learning Researcher — *Nov 2020 – Apr 2021*
  - Contributed to writing and developing **two patents**.
  - Researched and developed better tracking systems for our projects using state-of-the-art deep learning techniques.
  - Researched ways of applying state-of-the-art self-supervised depth estimation methods to our projects.
  - Researched ways of using re-id systems in the context of image/video retrieval.
  - **Technologies: Python, PyTorch, NumPy, Matplotlib, Shell Script.**
- **Presslabs** — Timisoara, Romania
  Junior Software Engineer — *July 2018 – Sept. 2018*
  - Worked on an **open source project** which aims to create a MySQL operator on Kubernetes.
  - Implemented new functionalities related to the behaviour of the MySQL cluster, tested them and also fixed bugs.
  - **Technologies: Go, Kubernetes.**
- **3Pillar Global** — Timisoara, Romania
  Junior Software Engineer — *June 2017- Sept. 2017*
  - Refactored essential parts of the software according to the newest standards.
  - **Technologies: TypeScript, React, Redux.**
- **"DSPLabs" research group at Politehnica University of Timisoara** — Timisoara, Romania
  Undergraduate Research Assistant — *Feb. 2017 - June 2018*
  - I was selected to develop an interface for the FENP algorithm, a real-time scheduling algorithm, created by "DSPLabs Timisoara". My work was used in a tutorial on **Litmus-RT page**. **Technologies: Shell script, C, Linux.**

Publications

- **ECCV 2022**: "Temporal and cross-modal attention for audio-visual zero-shot learning". **Otniel-Bogdan Mercea***, Thomas Hummel*, A. Sophia Koepke, Zeynep Akata.
- **CVPR 2022**: "Audio-visual Generalised Zero-shot Learning with Cross-modal Attention and Language". **Otniel-Bogdan Mercea**, Lukas Riesch, A. Sophia Koepke, Zeynep Akata. This paper was also accepted at **L3D-IVU** workshop.

Talks

- **The University of Amsterdam, May 2022**: Title of the talk: "Audio-visual Generalised Zero-shot Learning with Cross-modal Attention and Language".
- **IMPRS-IS symposium, Tübingen Feb. 2021**: Title of the talk: "From explainability and interpretability to 3D computer vision and efficient learning: increasing the performance of autonomous agents" (acceptance rate 14%).

Selected Achievements and Awards

- **IMPRS-IS Scholarship**: awarded in 2021 to 57 students out of 968 applications for a fully-funded PhD program.
- **1st Prize**: in the Kaggle competition "EEML 2019 - Electricity prediction" which was part of the event **"AI for Social Good"** organised by EEML.
- **Best Smart Mobility Project**: awarded in 2019 at UniHack for the project entitled "Wave".
- **Honour Student**: awarded in 2018 by Association "Orizonturi Universitare" in partnership with Romanian Academy and Timisoara City Council for outstanding achievements in my professional activity. This distinction is given to the best student from the whole faculty (BSc.+MSc.) every year and it is awarded only once per student.
- **Grand Prize**: awarded in 2018 at HackTM Sibiu edition, for the project named "SafeStreet".
- **Second place**: awarded in 2018 at national competition "Java competition for universities" organized by Oracle Academy for the project named "SPark - Community-Driven Smart Parking". This project appeared on multiple news websites.
- **Performance Scholarships**: awarded in 2015-2019 by Politehnica University of Timisoara and **Special Scholarship** awarded in 2018 for obtaining extraordinaire results at national contests.
- **Honors Diploma**: awarded in 2015 by Sebis Town Hall for increasing the prestige of the high school and town by the results obtained in Informatics/Mathematics competitions.
- **International Contest of Mathematics and Informatics "Caius Iacob"**: **Programming Section**: **"Second place"** in the VI Edition and **"Mention"** in the VII Edition. **Mathematics Section**: **"Second Place"** in VII Edition.
- **Informatics Olympiad county phase**: **"Mention"** in 2014 and **"Second place"** in 2015.

Reviewing

- CVPRw 2022 (L3D-IVU), ECCV 2022.

Selected Projects

- **"SafeStreet"**: is a project that detects violence in videos by using a drone and a neural network. **Technologies: Python, Keras, Shell script, OpenCV, NumPy.**
- **"Wave"**: is a project that reduces the physical interaction between a driver and the mobile phone by using the mobile phone's camera to detect hand gestures using neural networks. **Technologies: Python, Android, PyTorch, NumPy.**
- **"HybridAlpha"**: is an hybrid based on AlphaGo Zero and AlphaZero and it improves the performance of AlphaZero on resource constrained systems. **Technologies: Python, TensorFlow, NumPy.**
- **"Music Prediction"**: is a neural network system that predicts the popularity of a song considering the metadata, the lyrics and the melody of a song. **Technologies: Python, PyTorch, Spotify API, Genius API, NumPy, Pandas.**
- **"What Neural Networks can not learn?"**: is a project that investigates what current CNNs can not learn by studying them from multiple perspectives. **Technologies: Python, PyTorch, NumPy, Matplotlib.**

Additional Courses, Workshops and Summer Schools

- **Bitdefender**: I was selected to attend Cybersecurity courses at Bitdefender (acceptance rate <10%). Learned to debug applications/malware using assembly code. **Technologies: Ida Pro, Shell script and Android.**
- **Microsoft Timisoara**: I was selected to attend a Software development course by Microsoft Timisoara (acceptance rate <6.6%). Learned to develop applications using C# and Bing Maps. **Technologies: C#.**
- **Eastern European Machine Learning Summer School (EEML)**: I was accepted to attend EEML, organised mainly by Google DeepMind in 2019 (admission rate 21%), being among the only 10 undergrads selected. I was also selected and attended the 2022 edition.