Otniel-Bogdan Mercea, Ph.D.(current)

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Education

- **International Max Planck Research School for Intelligent Systems (IMPRS-IS)** — Tübingen, Germany
  PhD in Computer Science — *May 2021 - May 2024*
  - **PhD student** in the IMPRS-IS program, supervised by Prof. Zeynep Akata and Prof. Andreas Geiger.
  - **PhD Topics**: multi-modal learning, zero/few-shot learning, explainability and interpretability, foundation models.
  - **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*
  - **BSc 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*
  - Secured two patents for advancements in real-time multi-camera tracking systems.
  - Researched ways of improving tracking systems through self-supervised depth estimation.
  - Successfully implemented the first iteration of our real-time multi-camera tracking system.
  - **Technologies: Python, PyTorch, NumPy, Matplotlib, Shell Script.**

- **Presslabs** — Timisoara, Romania
  Junior Software Engineer — *July 2018 – Sept. 2018*
  - Successfully contributed to the development of the open-source MySQL operator for Kubernetes, including the implementation of new functionalities, bug fixing, and testing.
  - **Technologies: Go, Kubernetes.**

- **3Pillar Global** — Timisoara, Romania
  Junior Software Engineer — *June 2017- Sept. 2017*
  - Successfully refactored and optimized key components of the software, while also identifying and resolving bugs to improve overall performance. This led to a more readable and easier to maintain codebase.
  - **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. This led to some of my work being featured in a tutorial on the official Litmus-RT page. **Technologies: Shell script, C, Linux.**

Publications

- **CoRL 2022**: "Learning an Explainable Planner for Autonomous Driving". Katrin Renz, Kashyap Chitta, **Otniel-Bogdan Mercea**, A. Sophia Koepke, Zeynep Akata, Andreas Geiger. /.
- **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. /.

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

- **1st Prize** in the Kaggle competition "EEML 2019 - Electricity prediction".
- **Best Smart Mobility Project** awarded at UniHack 2019 for the project entitled "Wave".
- **Honour Student** awarded in 2018 by the Romanian Academy and Timisoara City Council for outstanding achievements in my professional activity.
- **Grand Prize** awarded at HackTM Sibiu 2018 edition, for the project named "SafeStreet".
- **Second place** awarded at national competition "Java competition for universities 2018" organized by Oracle Academy.
- **Honors Diploma** awarded in 2015 by Sebis Town Hall for exceptional achievements in Informatics/Mathematics competitions and for enhancing the prestige of the high school and town.
- **International Contest of Mathematics and Informatics Caius Iacob. Competitive programming section**: **Second place** in 2014 and **Mention** in 2015.
- **International Contest of Mathematics and Informatics Caius Iacob. Mathematics section**: **Second Place** in 2015.
- **Informatics Olympiad county phase**: **Mention** in 2014 and **Second place** in 2015.

Selected Scholarships

- **IMPRS-IS Scholarship** awarded in 2021 as one of the top 57 successful candidates out of 968 applications (5.8% acceptance rate) for a fully-funded PhD program at the Max Planck Institute for Intelligent systems.
- **Performance Scholarships** awarded every term by Politehnica University of Timisoara during my undergraduate for excellent academic performance.
- **Special Scholarship** awarded in 2018 by Politehnica University of Timisoara, recognizing exceptional results in national contests.

Reviewing

- CVPRw 2022 (L3D-IVU), ECCV 2022, CVPR 2023, ICCV 2023.

Highly selective Courses and Summer Schools

- **Eastern European Machine Learning Summer School (EEML)**: I have been selected as one of only 12 undergraduate students to attend EEML 2019, an event mainly organized by Google DeepMind with a competitive admission rate of just 21%.
- **Bitdefender**: I was selected to attend a higly competitive Cybersecurity course (acceptance rate less than 10%). Learned to debug desktop/mobile applications and malware using Assembly. **Technologies: Shell script, Android, Assembly.**
- **Microsoft Timisoara**: Demonstrated aptitude for software development by successfully completing a highly selective course with an acceptance rate less than 6.6%. Learned to develop applications in C# using Bing Maps. **Technologies: C#.**

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.**
- **What Neural Networks can not learn?** is a project that investigates from multiple perspectives what current CNNs can not learn in non-distributional shift scenario. **Technologies: Python, PyTorch, NumPy, Matplotlib.**