Otniel-Bogdan Mercea

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EDUCATION

- **Max Planck Institute for Intelligent Systems (MPI-IS) and University of Tübingen** — Tübingen, Germany
 *PhD in Computer Science (**Thesis yet to be submitted**)* — *May 2021 - Aug. 2024*
  - **PhD program**: International Max Planck research school for Intelligent Systems (IMPRS-IS).
  - **Supervisors**: Prof. Zeynep Akata and Prof. Andreas Geiger.
  - **PhD Topics**: multi-modal and zero/few-shot learning, and efficient adaptation of large-scale models.
  - **Duties**: Maintaining the EML website, supervising MSc theses, teaching, organizing reading groups, interviewing ELLIS candidates.

- **The University of Edinburgh** — Edinburgh, Scotland
  Master of Science in Artificial Intelligence; Distinction (Overall 76%) — *Sept. 2019 - Aug. 2020*
  - **Thesis**: "What Neural Networks can not learn?". **Supervisor**: Amos Storkey. **Grade**: Distinction (77%)
  - **Courses**: Algorithmic Game Theory, Machine Learning, Reinforcement Learning, Natural Language Processing, Computer Vision.

- **Politehnica University of Timisoara** — Timisoara, Romania
  Bachelor of Engineering in Computers and Information Technology; Top 3% (Overall 9.70/10) — *Oct. 2015 - June 2019*
  - **Thesis**: "HybridAlpha-Reinforcement Learning on Resource-Constrained Systems". **Supervisor**: Calin-Adrian Popa. **Grade**: 10/10. Thesis also accepted at RAAI 2019 conference.
  - **Courses**: Data Structures and Algorithms, Linear Algebra, Statistics, Software Engineering, Computer Security.

EXPERIENCE

- **Google DeepMind** — Zürich, Switzerland
  Research Intern — *Sep. 2024 – Current*
  - Working on video segmentation, supervised by Stefano Pellegrini, Jasper Uijlings, and Cordelia Schmid.

- **Helmholtz Munich and Technical University of Munich** — Munich, Germany
  Guest PhD student — *Jan. 2024/June 2024 – Aug. 2024*
  - Conducting research in multi-modal learning, supervised by Prof. Zeynep Akata, as part of my PhD. I also helped teach a seminar.

- **Google Research** — Grenoble, France
  Research Intern (4 months) + Student Researcher (4 months) — *July 2023 – Mar. 2024*
  - Worked on efficient adaptation of large-scale models, supervised by Anurag Arnab, Alexey Gritsenko, and Cordelia Schmid.
  - Collaborated with Aleksandra Nowak, Utku Evci, Yann Dauphin from Google DeepMind on a related project on efficient adaptation.
  - Outcome: a patent filling, a CVPR 2024 Highlight paper, a preprint, and a return internship offer at Google DeepMind.

- **Everseen** — Timisoara, Romania
  Machine Learning Researcher — *Nov. 2020 – Apr. 2021*
  - Researched ways of improving tracking systems in real-time multi-camera scenarios.
  - Outcome: two US patent fillings on real-time multi-camera tracking.

- **Presslabs** — Timisoara, Romania
  Junior Software Engineer — *July 2018 – Sept. 2018*
  - Successfully contributed to the development of the open-source MySQL operator (1021 ☆) for Kubernetes.
  - Outcome: implementation of new functionalities, bug fixing, and testing.

- **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 real-time scheduling algorithm. Worked with Cristina and Valentin Stangaciu.
  - Outcome: assessed the suitability of Litmus-RT for our project. Part of my work was featured in a tutorial on the Litmus-RT page.

PATENTS

- **US 20230200569-A1**: "System and method for adjusting a position of an order taking device". Ana Cristina Todoran, **O.-B, Mercea**, Razvan-Dorel Cioarga.
- **US 20230206466-A1**: "System and method for tracking and identifying moving objects". Ana Cristina Todoran, **O.-B. Mercea**.

PUBLICATIONS

- **Preprint 2024 (Under review)**: "Towards Optimal Adapter Placement for Efficient Transfer Learning". Aleksandra I. Nowak, **O.-B. Mercea**, Anurag Arnab, Jonas Pfeiffer, Yann Dauphin, Utku Evci ⌨
- **CVPRw 2024 (L3D-IVU)**: "Audio-Visual Generalized Zero-Shot Learning using Pre-Trained Large Multi-Modal Models". David Kurzendörfer*, **O.-B. Mercea***, A. Sophia Koepke, Zeynep Akata. (12 ☆)/⌨. This was a MSc thesis co-supervised by me.
- **CVPR 2024 (Highlight - Top 3.60%)**: "Time-, Memory- and Parameter-Efficient Visual Adaptation". **O.-B. Mercea**, Alexey Gritsenko, Cordelia Schmid, Anurag Arnab ⌨.

- **BMVC 2023 (Oral)**: "Video-adverb retrieval with compositional adverb-action embeddings". Thomas Hummel, **O.-B. Mercea**, A. Sophia Koepke, Zeynep Akata. (⌗ 6 ☆)/⌗.
- **DAGM GCPR 2023**: "Text-to-feature diffusion for audio-visual few-shot learning". **O.-B. Mercea**, Thomas Hummel, A. Sophia Koepke, Zeynep Akata. (⌗ 8 ☆)/⌗.
- **CoRL 2022**: "Learning an Explainable Planner for Autonomous Driving". Katrin Renz, Kashyap Chitta, **O.-B. Mercea**, A. Sophia Koepke, Zeynep Akata, Andreas Geiger. (⌗ 217☆)/⌗.
- **ECCV 2022**: "Temporal and cross-modal attention for audio-visual zero-shot learning". **O.-B. Mercea***, Thomas Hummel*, A. Sophia Koepke, Zeynep Akata. (⌗ 24 ☆)/⌗.
- **CVPR 2022**: "Audio-visual Generalised Zero-shot Learning with Cross-modal Attention and Language". **O.-B. Mercea**, Lukas Riesch, A. Sophia Koepke, Zeynep Akata. (⌗ 33 ☆)/⌗.

Technologies used

- **Fluent in:** Python.
- **Competent in:** Java, C/C++, Shell Scripting, Linux, Android.
- **Some experience in:** Go, Assembly, C#, Kubernetes, TypeScript, JavaScript, HTML, CSS.
- **Libraries used:** React, Redux, NumPy, Pandas, Matplotlib, JAX, PyTorch, TensorFlow, Keras.

Talks

- **Video & Image Sense Lab,** The University of Amsterdam, May 2022. "Audio-visual Generalised Zero-shot Learning with Cross-modal Attention and Language".
- **IMPRS-IS symposium,** Tübingen Feb. 2021. "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.
- **Honour Student** awarded in 2018 by the Romanian Academy, Timisoara City Council, and Association "Orizonturi Universitare" for outstanding achievements. Every year, only one student from the faculty (BSc and MSc) receives this distinction.
- **Grand Prize** awarded at HackTM Sibiu 2018 edition. HackTm is the biggest software and hardware hackathon in South Eastern Europe.
- **Second place** awarded at the 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.
  - **Mathematics section** : **Second Place** in 2015.
- **Informatics Olympiad county phase**: **Mention** in 2014 and **Second place** in 2015.

Selected Scholarships

- **OxML Scholarship** offered for Oxford Machine Learning Summer School 2024 (all tracks). Declined due to inability to attend all tracks.
- **Google RS Conference Scholarship** awarded to cover all my conference-related travel expenses for CVPR 2024.
- **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 International Max Planck Research School for Intelligent Systems.
- **Performance Scholarships** awarded every term during my undergraduate for excellent academic performance.
- **Special Scholarship** awarded in 2018, recognizing exceptional results in national contests.

Supervision

- **MSc thesis**: "Adapting to Misunderstandings of Communicating MLLMs on the Fly". **Student**: Yavuz Durmazkeser.
- **MSc thesis**: "Audio-Visual Generalized Zero-Shot Learning using Large Pre-Trained Models". **Student**: David Kurzendörfer. Accepted at CVPRw 2024 (L3D-IVU)

Teaching

- **Teaching Assistant** for the seminar "Advanced Topics in Vision-Language Models" (MSc level) at Technical University of Munich in 2024.
- **Teaching Assistant** for the course "Introduction to Machine Learning (INF 3151)" (BSc level) at University of Tübingen in 2023.

Reviewing

- CVPR 2022-2024, ECCV 2022-2024, ICCV 2023, NeurIPS 2023, TPAMI 2023, ICLR 2024, Best Romanian AI Thesis Awards 2024.

Highly selective Courses and Summer Schools

- **Oxford Machine Learning Summer School (OxML)**: Selected in 2024 to attend MLx Fundamentals and MLx Representation Learning & Gen. AI, organized by Oxford University's Deep Medicine Program, CIFAR, and AI for Global Goals.
- **Eastern European Machine Learning Summer School (EEML)**: Selected as one of only 12 undergraduate students to attend EEML 2019, mainly organized by Google DeepMind, with a competitive *admission rate of just 21%*.
- **Bitdefender**: Attend a highly competitive Cybersecurity course with an *acceptance rate of 10%*. Learned to debug desktop/mobile applications and malware using Assembly. Received an employment offer (I declined it).
- **Microsoft**: Successfully completed a highly selective software development course with an *acceptance rate of 6.6%*. Learned to develop applications in C# using Bing Maps.