Otniel-Bogdan Mercea

 merceaotniel.github.io/   github.com/MerceaOtniel   stackoverflow.com/u/4178517 in linkedin.com/in/otnielmercea
 bit.ly/GoogleScholarOtniel otimercea@gmail.com

EDUCATION

Max Planck Institute for Intelligent Systems and University of Tübingen Tübingen, Germany
PhD in Computer Science (IMPRS-IS doctoral program) *May 2021 - Aug. 2024*

- **Thesis**: *"Multimodal data efficient learning"*.
- **Supervisors**: Prof. Zeynep Akata (TUM & Helmholtz Munich) and Prof. Andreas Geiger (University of Tübingen).
- **Thesis committee**: Prof. Zeynep Akata, Prof. Andreas Geiger, Prof. Justus Thies (TU Darmstadt), Prof. Hildegard Kühne (University of Tübingen & MIT-IBM Watson AI Lab).
- **Activities**: EML website admin, supervise MSc theses, teach, organize reading groups, and interview ELLIS candidates.

The University of Edinburgh Edinburgh, Scotland
MSc in Artificial Intelligence; Distinction (Overall 76%) *Sept. 2019 - Aug. 2020*

- **Thesis**: *"What Neural Networks can not learn?"*. **Supervisor**: Prof. Amos Storkey. **Mark**: Distinction (77%).

Politehnica University of Timisoara Timisoara, Romania
BEng in Computers and Information Technology; Top 3% (Overall 9.70/10) *Oct. 2015 - June 2019*

- **Thesis**: *"HybridAlpha-Reinforcement Learning on Resource-Constrained Systems"*. **Supervisor**: Prof. Calin-Adrian Popa. **Mark**: 10/10.
- **Activities**: Hackathons, Competitive programming contests, Capture the flag competitions (Cybersecurity).
- **Undergraduate Research Assistant at DSPLabs**: developed an interface for the FENP real-time scheduling algorithm (supervised by Cristina and Valentin Stangaciu), part of my work being featured in a tutorial on the Litmus-RT page. Feb. 2017 - June 2018.

RELEVANT EXPERIENCE

Google DeepMind Zürich, Switzerland
Research Intern *Sep. 2024 – Dec. 2024*

- Keywords: *Python, JAX, Video Segmentation, Object detection, Object tracking.*
- Researching video segmentation with a focus on SAM 2, supervised by Stefano Pellegrini, Jasper Uijlings, and Cordelia Schmid.
- Outcome: successfully enhanced SAM 2 with amodal perception, offering benefits for tracking and segmentation tasks.

Helmholtz Munich and Technical University of Munich Munich, Germany
Guest PhD student *Jan./June 2024 – Aug. 2024*

- Keywords: *Python, PyTorch, NumPy, Multimodal large language models, Audio-visual learning, Zero-shot learning.*
- Researched multimodal large-language models and audio-visual learning under Prof. Zeynep Akata and assisted in teaching a MSc seminar.
- Outcome: a CVPR 2024 workshop paper, a preprint under submission, and a postdoctoral offer.

Google Research Grenoble, France
Research Intern (4 months) + Student Researcher (4 months) *July 2023 – Mar. 2024*

- Keywords: *Python, JAX, Time, memory and parameter efficient learning, Video and image classification, Optimal adapter placement.*
- Led research on efficient adaptation of large-scale models, supervised by Anurag Arnab, Alexey Gritsenko, and Cordelia Schmid.
- Collaborated with Aleksandra Nowak, Utku Evci and Yann Dauphin on optimal adapter placement for transfer learning.
- 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*

- Keywords: *Python, PyTorch, NumPy, Real-time multi-object tracking, Object detection, Object re-identification.*
- Researched ways of improving tracking systems in real-time multi-camera scenarios, such as drive-through and industrial warehouses.
- Outcome: developed the company's first prototype for real-time multi-camera tracking system, leading to two US patent filings.

Presslabs Timisoara, Romania
Junior Software Engineer *July 2018 – Sept. 2018*

- Keywords: *Go, Kubernetes, Development of website hosting platforms.*
- Contributed to the development of the open-source MySQL operator (1050 ☆) for Kubernetes.
- Outcome: successfully implemented new functionalities, fixed bugs, and conducted testing.

3Pillar Global Timisoara, Romania
Junior Software Engineer *June 2017- Sept. 2017*

- Keywords: *TypeScript, JavaScript, HTML, CSS, React, Redux, Web development.*
- Refactored and optimized critical components of the software and identified and resolved bugs to improve overall performance.
- Outcome: a significantly more readable and easier to maintain codebase.

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

- **Arxiv 2024**: *"Towards Optimal Adapter Placement for Efficient Transfer Learning"*. Aleksandra I. Nowak, **O.-B. Mercea**, Anurag Arnab, Jonas Pfeiffer, Yann Dauphin, Utku Evci. ⌨
- **CVPR-W 2024**: *"Audio-Visual Generalized Zero-Shot Learning using Pre-Trained Large Multi-Modal Models"*. David Kurzendörfer*, **O.-B. Mercea***, A. Sophia Koepke, Zeynep Akata. (◯ 14 ☆)/⌨.
- **HIGHLIGHT @ CVPR 2024 (Top 3.60%)**: *"Time-, Memory- and Parameter-Efficient Visual Adaptation"*. **O.-B. Mercea**, Alexey Gritsenko, Cordelia Schmid, Anurag Arnab. ⌨.
- **ORAL @ BMVC 2023**: *"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. (◯ 257☆)/⌨.
- **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. (◯ 36 ☆)/⌨.

Talks

- **Perception spotlight presentations,** Google Research, Mar. 2024. *"Time-, Memory- and Parameter-Efficient Visual Adaptation"*.
- **Video & Image Sense Lab,** The University of Amsterdam, May 2022. *"Audio-visual Generalised Zero-shot Learning"*.
- **IMPRS-IS symposium,** Tübingen Feb. 2021. *"Boosting autonomy: explainability, 3D vision and efficiency" (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. Only one student from the faculty (BSc and MSc) receives this distinction annually.
- **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 to the top 5.8% candidates (57 out of 968) for a fully-funded PhD program at IMPRS-IS.
- **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.

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

- **OxML**: Selected to attend OxML 2024, organized by Oxford University's Deep Medicine Program, CIFAR, and AI for Global Goals.
- **EEML**: One of only 12 undergraduate students to attend EEML 2019, mainly organized by Google DeepMind (*21% acceptance rate*).
- **Bitdefender**: Learned to debug applications/malware in Assembly in a competitive course (*10% acceptance rate*). Received a job offer.
- **Microsoft**: Learned to develop applications in C# using Bing Maps in a highly selective course (*6.6% acceptance rate)*.