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 — *May 2021 - Current*
  - **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, organising 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**: 77% (Distinction)
  - **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

- **Helmholtz Munich** — Munich, Germany
  Guest PhD student — *Jan 2024 – Current*
  - Conducting research under the supervision of Prof. Zeynep Akata, as part of my PhD project at IMPRS-IS.
- **Google Research** — Grenoble, France
  Research Intern (4 months) + Student Researcher (4 months) — *July 2023 – Mar. 2023*
  - Working 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 and a CVPR 2024 Highlight paper. Additionally, I have received a return internship offer for Summer 2024.
- **Everseen** — Timisoara, Romania
  Machine Learning Researcher — *Nov 2020 – Apr 2021*
  - Filled two patents for advancements in real-time multi-camera tracking systems.
  - Researched ways of improving tracking systems through self-supervised depth estimation.
- **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.
- **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. Worked in the Decision Lens team.
- **"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, part of my work being featured on Litmus-RT page. Worked with Cristina Stangaciu and Valentin Stangaciu.

Patents

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

Publications

- **CVPRw 2024 (L3D-IVU)**: "Audio-Visual Generalized Zero-Shot Learning using Pre-Trained Large Multi-Modal Models". David Kurzendörfer*, **Otniel-Bogdan Mercea***, A. Sophia Koepke, Zeynep Akata. /. This was a MSc thesis co-supervised by me.
- **CVPR 2024 (Highlight - Top 3.60%)**: "Time-, Memory- and Parameter-Efficient Visual Adaptation". **Otniel-Bogdan Mercea**, Alexey Gritsenko, Cordelia Schmid, Anurag Arnab .
- **BMVC 2023 (Oral)**: "Video-adverb retrieval with compositional adverb-action embeddings". Thomas Hummel, **Otniel-Bogdan Mercea**, A. Sophia Koepke, Zeynep Akata. /.
- **DAGM GCPR 2023**: "Text-to-feature diffusion for audio-visual few-shot learning". **Otniel-Bogdan Mercea**, Thomas Hummel, A. Sophia Koepke, Zeynep Akata. /.
- **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. /.

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 a single student from the whole 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 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

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

Reviewing

- CVPR 2022-2024, ECCV 2022-2024, ICCV 2023, NeurIPS 2023, TPAMI 2023, ICLR 2024.

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.
- **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.