# Bálint Mucsányi

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## ABOUT ME

Master's student at the University of Tübingen. Interested in Trustworthy ML, Computer Vision, and Probabilistic ML.

## EDUCATION AND TRAINING

### Master of Science (MSc) in Machine Learning
*University of Tübingen* [ 31/07/2021 – Current ]

**Address:** Geschwister-Scholl-Platz, 72074 Tübingen (Germany)
**Website:** https://uni-tuebingen.de/

### Bachelor of Science (BSc) in Computer Science
*ELTE Eötvös Loránd University* [ 02/09/2018 – 02/07/2021 ]

**Address:** Egyetem tér 1-3, 1053 Budapest (Hungary)
**Website:** https://www.inf.elte.hu/
**Final grade:** Outstanding (1.0/1.0)
**Type of credits:** ECTS – **Number of credits:** 180
**Thesis:** Efficient Example-Based Program Synthesis on a Tree-Structured Grammar

General undergraduate programme in computer science.
I received an award of excellence for my thesis and became an Outstanding Student of the Faculty.

### High School Diploma / Matura Examination
*Deák Téri Evangélikus Gimnázium* [ 31/08/2014 – 26/06/2018 ]

**Address:** Sütő utca 1., 1052 Budapest (Hungary)
**Website:** deakteri.hu
**Final grade:** Outstanding (1.0/1.0)

## HONOURS AND AWARDS

### Reinforcement Learning Tournament - 2nd Place

University of Tübingen - Autonomous Learning Group [ 08/2023 ]

Together with two fellow Machine Learning master's students, we placed second in the reinforcement learning tournament organized by the Autonomous Learning Group led by Prof. Dr. Georg Martius. I implemented a Rainbow-based, off-policy agent that secured the second-best performance in the entire tournament.

### Self-Driving Cars Competition - 1st Place

University of Tübingen - Autonomous Vision Group [ 02/2023 ]

I won all three challenges in Prof. Dr. Andreas Geiger's Self-Driving Cars lecture. We had to implement a racing car in OpenAI's Car Racing Environment. The three challenges were

1. Imitation Learning;
2. Reinforcement Learning;
3. Modular Pipeline.

### DAAD Scholarship

German Academic Exchange Service [ 04/2022 ]

I was awarded the DAAD Scholarship for All Academic Disciplines during my Machine Learning Studies at the University of Tübingen.

### Deutschlandstipendium

University of Tübingen; Federal Ministry of Education, Germany [ 04/2022 ]

I was awarded the Deutschlandstipendium during my Machine Learning studies at the University of Tübingen.

### Amazon Mentorship Program

Amazon.com, Inc. [ 04/2022 ]

The Deutschlandstipendium gave me the opportunity to join the Amazon Mentorship Program. I am under the mentorship of Fabio Madge.

### Deep Learning Competition - 1st Place

University of Tübingen - Cognitive Systems Group [ 19/01/2022 ]

With a fellow Master's student I won the Deep Learning Competition of the annual Deep Learning course in the Winter Semester, 2021/2022 at the University of Tübingen. Lecturer: Prof. Dr. Andreas Zell.

### Outstanding Student of the Faculty Award

ELTE Eötvös Loránd University [ 2021 ]

I received the Outstanding Student of the Faculty Award in 2021 at ELTE. This award is given annually to students with outstanding grades, valuable scientific contributions and demonstrator activities.

### Best Thesis Award

ELTE Eötvös Loránd University [ 2021 ]

I received the Best Thesis Award at ELTE Eötvös Loránd University for my bachelor thesis titled "Efficient Example-Based Program Synthesis on a Tree-Structured Grammar".

### National Conference of Scientific Students' Associations - 2nd Place

National Scientific Student Council [ 31/03/2021 ]

### Conference of Scientific Students' Associations - 1st Place

ELTE Eötvös Loránd University [ 15/12/2020 ]

### National Higher Education Scholarship

Ministry of Innovation and Technology, Hungary [ 31/08/2020 ]

National higher education scholarship of Hungary, which gifted and promising students can receive, based on their scientific, educational and teaching contributions. I was awarded the scholarship for two semesters in 2020. Similarly, I have been awarded the study scholarship of the Faculty of Informatics of ELTE in each semester of my studies.

### Ericsson Programming Championship

Ericsson Hungary [ 2019 ]

I teamed up with two fellow students of ELTE CS and did the tasks of the competition in Python. We managed to get to the final of the national championship and achieved 7th place there.

## PROJECTS

### Uncertainty Disentanglement in Deep Neural Networks

[ 03/2023 – Current ]

I am currently an MSc thesis student in the Scalable and Trustworthy AI (STAI) group at the University of Tübingen under the supervision of Michael Kirchhof and Dr. Seong Joon Oh. I am investigating the disentanglement of epistemic and aleatoric uncertainty in deep neural networks and rigorous benchmarks thereof.

**Link:** https://scalabletrustworthyai.github.io/

## Active Learning for Amortized Bayesian Inference

[ 10/2022 – 01/2023 ]

Internship at Mackelab, University of Tübingen. I worked on methods for active learning using simulation-based inference, and proposed a new sequential neural posterior estimation (SNPE) method.

**Link:** https://www.mackelab.org/

## Student researcher at MLforSE (Machine Learning for Software Engineering)

[ 31/03/2019 – 04/2022 ]

I joined the Machine Learning for Software Engineering research group at ELTE Eötvös Loránd University in 2019, and was working on example-based neural program synthesis methods during my Bachelor's.

Resulting papers:

1. Mucsányi, Bálint, et al. "Flexible Example-Based Program Synthesis on Tree-Structured Function Compositions." *SN Computer Science* 3.3 (2022): 218.
2. Gyarmathy, Bálint, et al. "Flexcoder: Practical Program Synthesis with Flexible Input Lengths and Expressive Lambda Functions." *ICPRAM*. 2021.

During my membership, the research group was also providing me a Research Scholarship.

## Analysing Influential Factors of a Successful Movie

[ 12/2021 – 02/2022 ]

Term project for the course "Data Literacy" at the University of Tübingen in Winter Semester 21/22. We analysed what the most predictive factors are of a successful movie, and also investigated the effect of the Covid pandemic on the income of the film industry.

**Links:** https://danieldauner.github.io/assets/pdf/data-literacy-project.pdf  |  https://github.com/bmucsanyi/data_literacy_project

## John von Neumann Talent Development Student Group

[ 01/02/2020 – 02/07/2021 ]

In February 2, 2020, I became a member of the John von Neumann Talent Development Student Group, which provides expanded knowledge relative to the core curriculum of ELTE Eötvös Loránd University, and provides additional research opportunities. Application to the group is judged on the basis of academic and scientific results.

## CONFERENCES AND SEMINARS

### Thirty-seventh Conference on Neural Information Processing Systems

[ New Orleans, 10/12/2023 – 16/12/2023 ]

I am the second author of the paper **"URL: A Representation Learning Benchmark for Transferable Uncertainty Estimates"** that won the **Best Student Paper Award** of the E-pi UAI 2023 workshop and got accepted to the Datasets & Benchmarks track of NeurIPS 2023.

### 10th International Conference on Pattern Recognition Applications and Methods (ICPRAM 2021)

[ Online Streaming, 03/02/2021 – 05/02/2021 ]

I presented a joint work with three fellow students at MLforSE, titled **"Flexcoder: Practical Program Synthesis with Flexible Input Lengths and Expressive Lambda Functions"**. Our paper was nominated for the **Best Student Paper Award** of the conference. After the conference, we were asked to write an extended paper for a **Special Issue of the Springer Nature Computer Science Journal**, 2022.

**Links:** http://icpram.org/  |  https://www.scitepress.org/Link.aspx?doi=10.5220/0010237803860395  |  https://scholar.google.com/citations?user=NexA8EEAAAAJ&hl=hu&oi=ao

### Conference of Scientific Students' Associations

[ Online Streaming, 15/12/2020 ]

I attended a conference organized by the Faculty of Informatics of ELTE, on which I presented a neural program synthesis tool with two fellow students of MLforSE. We achieved **first place** in the Software Technology department, and our work was submitted to the **National Conference of Scientific Students' Associations**, where we were awarded **second place**.

## WORK EXPERIENCE

### ML University Teaching Assistant
*University of Tübingen, Foundations of Machine Learning Systems group* [ 10/2022 – Current ]

**City:** Tübingen
**Country:** Germany

Between October 2022 and April 2023, I was a teaching assistant for the Mathematics for Machine Learning Master's course at the University of Tübingen. I was holding tutorials, designing exercise sheets, and grading exams, under the supervision of Dr. Armando Cabrera Pacheco. The course received the **Teaching Award of the Committee of Studies at the Department of Computer Science** in the Winter Semester 22-23.

Starting from October 2023, I am a teaching assistant for the Trustworthy Machine Learning Master's course at the University of Tübingen. My tasks involve designing exercise sheets, holding tutorials, and grading exams at the end of the term.

### CS University Teaching Assistant
*ELTE Eötvös Loránd University, Faculty of Informatics, Department of Software Technology* [ 29/02/2020 – 02/07/2021 ]

**City:** Budapest
**Country:** Hungary

I was asked by Dr. Tibor Gregorics to fill a teaching assistant position at the university in 2020. I taught Object Oriented Programming (both in English and Hungarian) and Event-driven Programming for 1-2 groups of students each semester (roughly 1-2 lectures per week).

## DIGITAL SKILLS

### Programming Languages
Advanced knowledge in: Python (PyTorch, Tensorflow, Pandas, etc.), Java, C / Experienced in: C++, C#, SQL, Haskell

### Version Control Systems
Git (GitHub, GitLab, BitBucket) / SVN

## LANGUAGE SKILLS

Mother tongue(s): **Hungarian**

Other language(s):

| **English** | **German** |
|---|---|
| **LISTENING** C2  **READING** C2  **WRITING** C2 | **LISTENING** B1  **READING** B1  **WRITING** B1 |
| **SPOKEN PRODUCTION** C1  **SPOKEN INTERACTION** C1 | **SPOKEN PRODUCTION** B1  **SPOKEN INTERACTION** B1 |

*Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user*