Laszlo Treszkai

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14 years of experience with both Python and the Linux shell.
4 years of industry experience with the design, implementation, and evaluation of ML algorithms.
Math-first understanding of Bayesian statistics and machine learning, incl. deep learning.

PROFESSIONAL EXPERIENCE

Power App Factory GmbH *Backend Developer* July 2024 – Nov 2024

- Improved a data visualization feature across 3 microservices while increasing speed and simplifying code.
- Developed features end-to-end, covering requirements management, UI design, database schema modifications, implementing the feature and API changes, and testing.
- Introduced more Pythonic expressions throughout the codebase.
- Using *Python*, *asyncio*, *SQLAlchemy*, *Redis*, *Pandas*, *GitLab CI*, *Flask*.

Finmatics GmbH *Backend & ML Engineer* Oct 2019 – May 2023

- Prevented downtime by developing robust database migrations for PostgreSQL to update data and schema.
- Analyzed and optimized slow SQL database queries.
- Used a NoSQL key-value cache (Redis) to implement locks and cache frequently retrieved data.
- Improved throughput through implementing parallelizable asynchronous task pipelines with Celery.
- Simplified code and increased speed with large-scale refactorings during feature development.
- Improved prediction accuracy (#1 problem of our customers) with ML to extract information from invoices, and introduced an evaluation system to test model accuracy to ensure that changes improve our KPIs.
- Using *Python*, *PostgreSQL*, *Redis*, *NumPy*, *PyTorch*, *PyTorch Geometric*, *Pandas*, *Django*, *Docker*, *Celery*.

Sclable Business Solutions GmbH *AI Research Engineer* Nov 2018 – Mar 2019

- Reduced our client's engineering costs with a custom-made Bayesian recommendation system.
- Used *Python*, *Tornado*, *PostgreSQL*, *SQLAlchemy*, *Pandas*, *NumPy*, *SciPy*, *unittest*, *OpenCV*.

TTControl GmbH *Embedded Software Engineer* Apr 2014 – Mar 2016

- Worked on the company's most complex safety-critical electronic control unit at the time (HY-TTC 500)
- Developed core software features in *C language* and *assembly* for our ECU, such as EEPROM handling.
- Created testing tools and test cases in *Python*.
- Led successful certification discussions with the TÜV and coordinated *software testing* with off-site engineers.

Robert Bosch Kft. *Test Software Developer Intern* Aug 2010 – Dec 2010

- Reduced the costs of system tests fivefold by implement a proprietary *network protocol stack* in *Python*.

EDUCATION

MSc: Artificial Intelligence 2017 – 2018
University of Edinburgh, United Kingdom *(with distinction)*

- Courses in probabilistic modelling, ML, deep learning, decision making, and natural language processing.
- Master's thesis: *Likelihood-based Planning with Loops*, presented at ICAPS.

BSc and **MSc**: Electrical Engineering (Embedded Information Systems) 2007 – 2013
Budapest University of Technology and Economics, Hungary *(degree: Excellent)*

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PUBLICATIONS

A Correctness Result for Synthesizing Plans With Loops in Stochastic Domains 2020

• First author of a paper on automated planning, with Vaishak Belle. *(Int. J. of Approximate Reasoning)*

Crystal Clear Electronics 2018

Chapter 16: The timer module

• Authored a *book chapter* aimed at high school students on embedded hardware and software design.

www.treszkai.com (Posts about programming, mathematics, AI.) 2018 – ongoing

Evaluation of function calls in Haskell, Paper summary: Inverse RL, Posterior sampling with MCMC

FURTHER PROJECTS

The effects of daylight savings time adjustment on the incidence rate of acute myocardial infarction

Reinterpreting statistical significance with Bayesian methods 2019

• Estimate the increase in heart attacks after losing an hour of sleep, with well-defined credible intervals.

• Fit a hierarchical statistical model on incidence counts using probabilistic programming with *PyStan*.

BEST Python package: Bayesian Estimation Supersedes the t-test 2019

Main author of the `best` *Python package, to serve as a Bayesian drop-in replacement for t-tests*

• Fit t-distributions on one-dimensional data with *PyMC3*, and plot posteriors with Matplotlib.

Estimating the uncertainty of deep neural networks 2018

• Experiments with calibration methods, such as deep ensembles or test-time dropout. (Using *Keras*.)

Literature Review: Noise-contrastive estimation and related methods 2017

• Comparing generative adversarial networks (*GAN*s) and their predecessor, noise-contrastive estimation.

BME Formula Racing Team 2011 – 2013

Group Leader of Low Voltage Electronics (FREC-003 race car), Hardware+Firmware Engineer (FRC-005)

• *Designed* the low voltage *system of 9 electronic control units* and *30 sensors* in a Formula Student car.

• *Lead a group of 7 students* (mechanical and electrical engineers) to design and manufacture this system.

• Team was awarded Engineering Design 1st place, Energy Efficiency 1st place at the international FSH 2013.