Andrej Leban

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Experience

Theorem LP **January 2023 – August 2023**
Researcher *San Mateo, California*

Research Intern **May 2022 – August 2022**
Developed statistical and machine learning models for investment in the marketplace lending space for a $3.5B AUM hedge fund that, for example:

- Predicted aggregate recovery on defaulted auto loans to within 1%.
- Optimized pricing policy to reduce adverse selection while maintaining target profitability.
- Priced secondary-market loan-pool bids using individual-loan-level predictions.
- Predicted the risk of an individual loan defaulting for home-improvement loans.

University of California, Berkeley **February 2023 – May 2023**
Research Assistant (part-time) *Berkeley, California*

Graduate Student Researcher **January 2022 – January 2023**
Performed research as part of Project CETI, an effort to decipher sperm whale communication using deep learning.

Translated **May 2021 – September 2021**
Machine Learning Intern *Rome, Italy*
Created hierarchical Bayesian models to quantify attributes such as the translator's error rate in translated text, using fat-tailed and zero-inflated distributions to model the process.

Gen-I **April 2018 – August 2019** (– March 2020 non-compete)
Quantitative Analyst *Ljubljana, Slovenia*

- Created a data capture + backtesting/paper-trading stack in Python; directly lead to the approval of a new algorithmic trading division.
- Using the above, devised new trading algorithms and strategies.
- In charge of a team tasked with evaluating *electricity transfer capacities*. I proposed and implemented modeling them as exotic derivatives.
- Expanded existing tools, such as a fundamentals-based regional electricity market simulator.

Digiverse *(Project contract)* **2018**
Produced a graph software solution in C++ with Boost.Graph and Eigen. *Ljubljana, Slovenia*

EBA **May 2016 – April 2018**
Independent Developer *Ljubljana, Slovenia*

- Created a linear algebra/algorithm library for deep learning on the GPU in OpenCL, which was plugged into existing C++ codebase.
- Designed and implemented an asynchronous and multithreaded middleware for PostgreSQL in C++ which drove a distributed storage solution (similar solutions).

Education

University of Michigan, Ann Arbor **2023 – present**
Ph.D. in Statistics

Working with Prof. Yuekai Sun.

University of California, Berkeley **2022**
M.A. in Statistics *GPA: 3.97*

3 semesters, 44 credits.

Faculty of Mathematics & Physics, University of Ljubljana **2016**
Diploma in Mathematical Physics

Equivalent to a combined Bachelor's and Master's degree. Besides theoretical/mathematical physics, particular focus on mathematical modeling, e.g., in Computational Physics.

Publications

- Leban - Distributional Autoencoders Know the Score, 2025 (NeurIPS 2025)

  For a recently introduced type of autoencoders, I prove that the geometry of the encoding aligns exactly with the data distribution score, *and* that any latent coordinates beyond the data manifold carry no information. Typically, unsupervised learning methods trade off data distribution learning against dimensionality reduction.

- Beguš* and Leban*, Gero - Approaching an unknown communication system by latent space exploration and causal inference, 2023 (under review)
  Beguš, Sprouse, Leban, Silva, Gero - Vowel- and Diphthong-Like Spectral Patterns in Sperm Whale Codas, 2025 (Open Mind (MIT Press))

  The first work proposes a novel methodology to identify representations learned by GANs. When trained on raw whale communication, it finds – for the first time – specific acoustic attributes that might serve as carriers of meaning. The second work follows up on these clues and identifies specific, intentional patterns in the predicted attributes, suggesting that they serve as building blocks of the communication system.

- Miccheli, Leban, et al. - A Bayesian approach to translators' reliability assessment, 2022 (Preprint)

- Leban - Time-dependent current through a quantum dot in the presence of a voltage probe, 2016 (Diploma Thesis)

  To the best of my knowledge, this thesis was the first work to examine the effects of a coupled voltage probe on the temporal characteristics of a current through a quantum dot, illustrating the transition from quantum mechanical conductance to the classical one. Supervised by Dr. Tomaž Rejec from the Department of Theoretical Physics, Jožef Stefan Institute.

Note: * denotes equal authorship.

Skills

Additional theoretical knowledge

Considerable self-study in Finance (example project) while working in the industry.

Programming Languages

- **C++**
- **Python** (Top 1%+ Advent of Code 2018) & **PyTorch**
- **R**
- **OpenCL, Wolfram Mathematica, Bash, MATLAB**

Technical

- **Cloud computing** (AWS, Azure)
- **Git**
- **Databases** (PostgreSQL, T-SQL, MongoDB)
- **Build systems** (CMake, Bazel), **Automated testing**
- **LaTeX**
- **Linux, macOS, Windows**

Language skills

- Slovene
- English (IELTS band 8.5/9, TOEFL IBT 117/120)
- German (Took up intense self-study in late 2016, obtaining the *C1 Goethe-Zertifikat* in early 2017)
- Italian
- Croatian

Honors & Awards / Other

- NeurIPS 2025 Financial Aid Award
- GRE: Q:170/170, V:170/170
- Multiple Gold Prizes and top ten placements in national competitions in mathematics, physics, logic, English, and history (Slovenia).
- The Zois Scholarship for Gifted Students throughout high school & university.