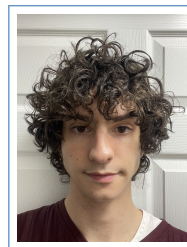


Alec Boyadjiev

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Profile

Computer science and applied mathematics student focused on stochastic systems, random structures, and algorithmic design. Combines measure-theoretic modeling with practical implementation and experimentation. Experience includes point processes, random graph theory, optimization algorithms, and reproducible computational systems.

Education

- 2022–2026 **BSc Computer Science and Engineering**, *Technical University Eindhoven*, GPA 7.58
- 2022–2026 **BSc Applied Mathematics**, *Technical University Eindhoven*, GPA 7.58
- 2026–2028 **MSc Mathematics**, *University of Amsterdam*

Research and Engineering

- 2026 **Bachelor Thesis**, *A Point Process Framework for Local Limits of Random Graphs* [\[Submitted Version\]](#), Eindhoven
Developed a point process framework for local weak limits of sparse labeled random graphs, with vertices labeled in some metric space, by representing rooted graphs as counting measures. Proved a lifting theorem characterizing when weak convergence of these spatial representations implies Benjamini–Schramm convergence of the corresponding rooted graphs, and combined the framework with Palm theory to treat uniform rooting and local weak convergence. Generalized the theory of spatial inhomogeneous random graphs with broader vertex processes and label spaces, including Cox processes on $\mathbb{R}^d$ and p -adic spaces $\mathbb{Q}_p^d$.
- 2025–2026 **Research Project**, *Contractive Recurrent Classifier* [\[Repo\]](#) [\[Paper\]](#)
Designed a contractive recurrent neural architecture with provable stability bounds. Implemented and evaluated on MNIST, demonstrating competitive performance relative to baseline MLPs, with consistent gains in sparse regimes. Provided full experimental reproducibility with accompanying codebase and report.
- 2025 **Engineering Project**, *Fiducial*, Eindhoven / Delft
Designed and implemented an evolutionary optimization algorithm for camera placement and trajectory planning in automated calibration systems. Achieved efficient search through parallelization and hyperparameter tuning under geometric and system constraints.

Systems and Tooling

2025–Present **Agentic Research Infrastructure**, *Integrated LaTeX Research Environment* [\[Repo\]](#)
Developed a unified agentic LaTeX-based research system combining a clean LaTeX template with agentic AI research workflows. Includes reproducible setup, transfer automation for existing LaTeX reports, and embedded prompt-guided tooling. Adopted by peers with improvements in iteration speed and workflow consistency.

Selected Projects

2022–Present

- Built a symbolic algebra system in Python supporting differentiation and expression simplification.
- Developed a full-stack social media application with backend, frontend, and database integration (Java).
- Implemented a fractal visualization engine with arbitrary zoom depth driven by analytic expressions.

Independent Mathematical Work

2018–Present

- Studied fractional calculus under multiple definitions and their structural differences.
- Analyzed linear dynamical systems with custom simulation and visualization tools.
- Conducted numerical experiments on complex-valued functions via bounded integration methods.

Technical Skills

Languages Python, Java, C++, MATLAB
Mathematics Stochastic processes, point processes, random graphs, dynamical systems
Tools PyTorch, LaTeX, Git, numerical simulation, parallel computing

Languages

English	Native	<i>US citizenship</i>
Bulgarian	Working proficiency	<i>Bulgarian citizenship</i>

Additional

- Graphic design (Photoshop)
- Music production (Ableton, generative systems)