

Hristo Papazov

PhD Candidate in the Theory of Machine Learning Lab at EPFL

Anticipated Graduation Date: 06/2027

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Research Interests

My research focuses on uncovering hidden algorithmic processes underlying structured data through discrete and gradient-based methods. I take broad interest in Algorithmic Learning Theory and Program Synthesis.

Education

2022/09 - present	PhD in Theoretical Machine Learning, EPFL (GPA 6.00/6.00) – Advised by Nicolas Flammarion.
2021/09 - 2022/08 Transferred to EPFL	PhD in Applied Mathematics, MIT (GPA 5.00/5.00) – Worked on discrete algorithms and coursework requirements.
2017/09 - 2021/05	A.B. in Mathematics/Certificate in Applications of Computing, Princeton (GPA 3.95/4.00) – <i>Magna cum laude</i>
2020/01 - 2020/06	Exchange Semester in Pure Mathematics, Worcester College, Oxford (GPA 4.00/4.00)
2012/09 - 2017/05	Bulgarian and US High School Diplomas, American College of Sofia (GPA 5.95/6.00) – <i>Summa cum laude</i>

Publications

Journal Publications

- [5] A. Logunov and **H. Papazov**, “An elliptic adaptation of ideas of carleman and domar from complex analysis related to levinson’s loglog theorem,” *Journal of Mathematical Physics*, vol. 62, no. 6, 2021.

Conference Publications

- [1] **H. Papazov**, F. D’Angelo, and N. Flammarion, “Exact learning of arithmetic with differentiable agents,” in *Workshop on Mathematical Reasoning and AI, NeurIPS*, PMLR, 2025.
- [2] **H. Papazov** and N. Flammarion, “Learning algorithms in the limit,” in *Proceedings of Thirty Eighth Conference on Learning Theory*, N. Haghtalab and A. Moitra, Eds., ser. Proceedings of Machine Learning Research, vol. 291, PMLR, 2025, pp. 4486–4510.
- [4] A. Hristov, A. Tahchiev, **H. Papazov**, N. Tulechki, T. Primov, and S. Boytcheva, “Application of deep learning methods to snomed ct encoding of clinical texts: From data collection to extreme multi-label text-based classification,” in *Proceedings of the International Conference on Recent Advances in Natural Language Processing (RANLP 2021)*, 2021, pp. 557–565.

Preprints

- [3] **H. Papazov**, “The role of dimension in the online chasing problem,” *arXiv preprint arXiv:2307.09350*, 2023.

Experience

2022/06 – 2022/09	Summer Research under Reitano Fellowship, MIT Wrote a paper with novel lower bounds on the competitive ratio of the Convex Body Chasing and extended the analysis of the problem to general metric spaces.
2020/06 – 2020/09	ML Intern, Ontotext Worked on EU research projects. Extracted disease data from medical ontologies using SPARQL queries. Expanded semantic knowledge graphs with medical data in GraphDB. Implemented a fast algorithm for ontological mappings extraction. Designed randomized natural language augmentation algorithms for creation of additional synthetic data. Ran BioBERT multi-label text classification experiments on the Dutch supercomputer Cartesius using a Unix-like batch system. Published a paper at RANLP 2021.
2019/06 – 2019/09	Summer Research, Princeton Generalized Levinson’s LogLog Theorem to cover solutions of linear elliptic PDE with real analytic coefficients and published this research in the Journal of Mathematical Physics with Professor Aleksandr Logunov.
2017/09 – 2019/12	Student Manager, Princeton Dining Rose through the ranks: from student worker – to student captain – to student manager. Managed 12 student workers over 5-hour long shifts twice a week. Coordinated effort and logistics with professional dining hall staff. Coordinated and supervised dining operations for the 2018th Princeton Reunions.

Teaching and Supervision

Fall 2025	MSc Project of Ender Isik, EPFL Algorithmic Synthesis with Neural Cellular Automata
Fall 2025	MSc Project of Khan Nguyen, EPFL Learning Computable Functions with Polynomial-Size Characteristic Sets
Fall 2023 – 2025	Teacher Assistant for Machine Learning CS-433, EPFL
Spring 2024 – 2025	Teacher Assistant for Theory of Computation CS-251, EPFL
Spring 2023	Teacher Assistant for Probability and Statistics MATH-235, EPFL

Selected Honors and Awards

2022/09	EDIC PhD Fellowship, EPFL Computer Science Department
2021/09	Reitano Fellowship, MIT Math Department
2021/05	Sigma Xi Book Award for Outstanding Research, Princeton Math Department
2020/09	Phi Beta Kappa, PBK, Beta Chapter of New Jersey
2019/09	Shapiro Prize for Academic Excellence for the Princeton Class of 2021, Princeton
2017/06	Bronze Medal, 58th International Math Olympiad

2017/05	Math Department Excellence Prize , <i>American College of Sofia</i>
2017/05	1st Place , <i>Bulgarian National Math Olympiad</i>
2016/06	Bronze Medal , <i>57th International Math Olympiad</i>
2016/05	Bronze Medal , <i>33rd Balkan Math Olympiad</i>
2013/06	Bronze Medal , <i>17th Junior Balkan Math Olympiad</i>