Dávid Pál

Curriculum Vitae

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I am a machine learning researcher and a machine learning engineer. My expertise is contextual bandits, ads ranking, ads auctions, discrete and continuous optimization, big data, deep learning, spam filtering.

Employment

June 2025 – present
Staff Machine Learning Engineer at Uber, Sunnyvale, CA
I work on ML models and optimization algorithms that set prices for Uber riders and drivers.

March 2024 – February 2025
Sr. Staff Machine Learning Engineer at Coupang, Mountain View, CA
I worked on machine learning models for search ranking.

January 2021 – February 2024
Staff Machine Learning Engineer at Instacart, New York, NY
I worked on machine learning models for ads ranking. I built a system for training click-through rate prediction models using Tensorflow. I worked on machine learning models that allocate discount coupon to customers. I co-authored three patents.

May 2019 – December 2020
Principal Applied Researcher at Expedia Group, New York, NY
I lead a team of 3 researchers building system for optimizing ad campaigns. I built two libraries for solving large scale optimization problems using Apache Spark.

Sep 2014 – May 2019
Senior Research Scientist at Yahoo/Oath/Verizon Media Research, New York, NY
I designed and implemented machine learning models that filter spam and phish emails by doing large scale clustering of emails using Hadoop MapReduce and Apache Spark. I co-authored one patent. I published multiple papers at NIPS and ICML. I served as a reviewer for COLT, ALT, ICML and area chair for NIPS. I mentored 4 research interns.

Sep 2011 – Sep 2014
Software Engineer at Google, New York, NY
I was a backend engineer on the Google Ad Exchange team. I designed, authored a patent for and implemented the "passback" ad auction algorithm, which processes 100 billion ad impressions per day and generates revenue of tens of billions of dollars per year. I also worked on the data pipelines for reserve price optimization. The work was done in C++ and Python.

Jul 2007 – Sep 2007
Research Internship at Google, New York, NY
I designed an ad auction algorithm for AdWords that unifies GSP (generalized second price) and VCG (Vickrey-Clarke-Groves) auctions and proved mathematical theorems about it. The end result was an academic paper with description of the algorithm and its properties that Google later used.

Jun 2004 – Dec 2004
Programmer at Applied Software Consultants, Bratislava, Slovakia
I was a software engineer in a small family-run company that develops software for elementary schools and high schools. I worked on a desktop application that keeps track of students, their grades, etc. The work was done in C# and PHP.

Academics

January 2022 – May 2022 **Adjunct Professor at Tandon School of Engineering,**
New York University, New York, NY
I taight a graduate course "Statistical and Computational Foundations of Machine Learning".

Jul 2009 – Jun 2011 **Postdoctoral Fellow at Department of Computing Science,**
University of Alberta, Edmonton, AB, Canada
Advisor: Prof. Csaba Szepesvári
I did research in machine learning and in statistics (contextual bandits, online optimization, entropy estimation).

Jan 2005 – May 2009 **Ph.D. in Computer Science, School of Computer Science,**
University of Waterloo, Waterloo, ON, Canada
Advisor: Prof. Shai Ben-David
Ph.D. Thesis: Contributions to Unsupervised and Semi-Supervised Learning

Sep 1999 – May 2004 **"Magister Degree" in Computer Science,**
Faculty of Mathematics, Physics and Informatics,
Comenius University, Bratislava, Slovakia
Advisor: Prof. Martin Škoviera Thesis: Steiner Colorings of Cubic Graphs

Technical Skills

- Python, Java, Scala, C++, Apache Spark, MapReduce, Tensorflow, LaTeX

Service

- Area chair of NIPS 2018, 2019
- Program Committee member of COLT 2017, COLT 2024
- Reviewer for ICML 2016–2018; NIPS 2008–2014, 2016; COLT 2007, 2008, 2016, 2019–2023; AISTATS 2017–2018; STOC 2008; AAAI 2016; IJCAI 2016; ALT 2022, 2023.
- Organizer of the Internet Problem Solving Contest, http://ipsc.ksp.sk/, 2000 – 2004, 2007
- Organizer of correspondence seminars in mathematics and computer science for Slovak high school students 1999 – 2004.

Awards

- co-author of a patent: "Distributed algorithm for solving the generalized knapsack problem" (Application no. 63/407,644)
- co-author of a patent: "Accounting for variable dimensions of content items when positioning content items in a user interface having slots for displaying content items" (US 20230109298 A1)
- co-author of a patent: "Message classification" (US 20180159808 A1)
- co-author of a patent: "Allocation of content inventory units" (US 20160364766 A1)

- co-author of a patent: "Passback auction" (US 20140316922 A1)
- David R. Cheriton Scholarship, 2007 – 2009
- COLT 2006 Best Student Paper Award
- 15th place in ACM ICPC 2000, Central European Region
- 14th place in ACM ICPC 1999, Central European Region
- Bronze Medal, Central European Olympiad in Informatics 1999
- Winner of Internet Problem Solving Contest 1999, High School Division
- Top 10 at Slovak National Olympiad in Informatics in 1997, 1998, 1999
- Top 10 at Slovak National Olympiad in Physics in 1999

Personal

- Dual citizenship: Slovak Republic & U.S.

References

Edo Liberty
CEO of Pinecone
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https://www.linkedin.com/in/edo-liberty-4380164/

S. Muthu Muthukrishnan
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University of Alberta, Edmonton, AB, Canada
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www: http://www.ualberta.ca/~szepesva/

Publications

[1] Alina Beygelzimer, Dávid Pál, Balázs Szörényi, Devanathan Thiruvenkatachari, Chen-Yu Wei, and Chicheng Zhang. Bandit multiclass linear classification: Efficient algorithms for the separable case. In Kamalika Chaudhuri and Ruslan Salakhutdinov, editors, *International Conference on Machine Learning, 9–15 June 2019, Long Beach, CA, USA*, 2019.

[2] Alexander Golovnev, Dávid Pál, and Balázs Szörényi. The information-theoretic value of unlabeled data in semi-supervised learning. In Kamalika Chaudhuri and Ruslan Salakhutdinov, editors, *International Conference on Machine Learning, 9–15 June 2019, Long Beach, CA, USA*, 2019.

[3] Satyen Kale, Zohar Karnin, Tengyuan Liang, and Dávid Pál. Adaptive feature selection: Computationally efficient online sparse linear regression under rip. In Doina Precup and Yee Whye Teh, editors, *International Conference on Machine Learning, 6–11 August 2017, International Convention Centre, Sydney, Australia*, volume 70, pages 1780–1788, 2017.

[4] Francesco Orabona and Dávid Pál. Scale-free online learning. *Theorerical Computer Science*, 2017. Available at http://arxiv.org/abs/1601.01974, DOI: https://doi.org/10.1016/j.tcs.2017.11.021.

[5] Chansoo Lee, Satyen Kale, and Dávid Pál. Hardness of online sleeping combinatorial optimization problems. In D. D. Lee, M. Sugiyama, U. V. Luxburg, I. Guyon, and R. Garnett, editors, *Advances in Neural Information Processing Systems 29 (NIPS 2016)*, 2016.

[6] Francesco Orabona and Dávid Pál. From coin-betting to parameter-free online learning. In D. D. Lee, M. Sugiyama, U. V. Luxburg, I. Guyon, and R. Garnett, editors, *Advances in Neural Information Processing Systems 29 (NIPS 2016)*, 2016.

[7] Francesco Orabona and Dávid Pál. Open problem: Parameter-free and scale-free online algorithms. In Vitaly Feldman, Alexander Rakhlin, and Ohad Shamir, editors, *Proceedings of 29th Annual Conference on Learning Theory (COLT 2016), New York, NY, USA*, 2016.

[8] Francesco Orabona and Dávid Pál. Scale-free algorithms for online linear optimization. In Kamalika Chaudhuri, Claudio Gentile, and Sandra Zilles, editors, *Algorithmic Learning Theory, 26th International Conference, ALT 2015, Banff, AB, Canada, October 4-6, 2015*, pages 287–301, 2015.

[9] Gábor Bartók, Dean Foster, Dávid Pál, Alexander Rakhlin, and Csaba Szepesvári. Partial monitoring – classification, regret bounds, and algorithms. *Mathematics of Operations Research*, 39(4):967–997, June 2014.

[10] Yasin Abbasi Yadkori, Dávid Pál, and Csaba Szepesvári. Online-to-confidence-set conversions and application to sparse stochastic bandits. In Neil Lawrence and Mark Girolami, editors, *Proceedings of the 15th International Conference on Artificial Intelligence and Statistics (AISTATS 2012), La Palma, Canary Islands, Spain*, pages 1–9, 2012.

[11] Gábor Bartók, Dávid Pál, and Csaba Szepesvári. Minimax regret of finite partial-monitoring games in stochastic environments. In Sham M. Kakade and Ulrike von Luxburg, editors, *Proceedings of 24nd Annual Conference on Learning Theory (COLT 2011), Budapest, Hungary*, 2011.

[12] Yasin Abbasi Yadkori, Dávid Pál, and Csaba Szepesvári. Improved algorithms for linear stochastic bandits. In J. Shawe-Taylor, R. S. Zemel, P. L. Bartlett, F. Pereira, and K. Q. Weinberger, editors, *Advances in Neural Information Processing Systems 24 (NIPS 2011), December 12-17, 2011, Granada, Spain*, 2011.

[13] Gábor Bartók, Dávid Pál, and Csaba Szepesvári. Toward a classification of partial monitoring games. In Marcus Hutter, Frank Stephan, Vladimir Vovk, and Thomas Zeugmann, editors, *ALT 2010, Canberra, Australia*, 2010.

[14] Shai Ben-David, Tyler Lu, Teresa Luu, and Dávid Pál. Impossibility theorems for domain adaptation. In Yee Whye Teh and Mike Titterington, editors, *Proceedings of the 13th International Conference on Artificial Intelligence and Statistics (AISTATS 2010), Chia Laguna Resort, Sardinia, Italy*, volume 9, pages 129–136, 2010.

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[16] Barnabas Poczós, Dávid Pál, and Csaba Szepesvári. Estimation of Rényi entropy and mutual information based on generalized nearest-neighbor graphs. In J. D. Lafferty, C. K. I. Williams, J. Shawe-Taylor, R. S. Zemel, and A. Culotta, editors, *Advances in Neural Information Processing Systems 23 (NIPS 2010), December 6-11, 2010, Vancouver, Canada*, 2010.

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[23] Dávid Pál and Martin Škoviera. Colourings of cubic graphs by small Steiner triple systems. *Graphs and Combinatorics*, 23(2):217–228, 2007.

[24] Shai Ben-David, Ulrike von Luxburg, and Dávid Pál. A sober look at clustering stability. In Gábor Lugosi and Hans Ulrich Simon, editors, *Proceedings of 19th Annual Conference on Learning Theory (COLT 2006), Pittsburg, PA, USA*, pages 5–19. Springer, 2006.