

Cenk Baykal

ML & QUANT RESEARCHER

baykal@alum.mit.edu | [baykalc.github.io](https://github.com/baykalc) | linkedin.com/in/cenkbaykal | [Google Scholar](https://scholar.google.com/citations?user=...)

EDUCATION

Massachusetts Institute of Technology

PH.D. IN COMPUTER SCIENCE (GPA: 5.00/5.00)

- Minor: Probability in High Dimension (Mathematics)
- Thesis: *Sampling-based Algorithms for Fast and Deployable AI*
- Advisor: Daniela Rus

Cambridge, MA

2017-2021

Massachusetts Institute of Technology

S.M. IN COMPUTER SCIENCE (GPA: 4.91/5.00)

- Thesis: *Algorithms for Persistent Autonomy and Surveillance*
- Advisor: Daniela Rus

Cambridge, MA

2015-2017

University of North Carolina at Chapel Hill

B.S. COMPUTER SCIENCE WITH HIGHEST HONORS, B.A. MATHEMATICS (GPA: 3.91/4.00)

- Graduated with Highest Distinction
- Thesis: *Design Optimization Algorithms for Concentric Tube Robots*
- Advisor: Ron Alterovitz

Chapel Hill, NC

2011-2015

EXPERIENCE

Two Sigma

QUANTITATIVE RESEARCHER

- Design systematic alpha strategies that combine alternative data and market microstructure signals
- Build and maintain Python/pandas/NumPy research tooling to accelerate signal evaluation and backtesting
- Partner with portfolio managers to translate promising research prototypes into production pilots
- Advanced two production-pilot alpha strategies through signal review with double-digit annualized bps uplift in out-of-sample tests

New York City, NY

July 2024 - Present

Google Research

RESEARCH SCIENTIST

- Developed conditional computation algorithms for transformers that enabled up to **30%** speedups on Large Language Models (LLMs)
- Designed data-efficient knowledge distillation strategies that led to improved transformer architectures with only **50%** of teacher labeling cost
- Mentored scholars in Google CSRMP, supporting project design and research execution for students from historically marginalized groups
- Received the 2023 Google Research Tech Impact Award for leading "high-impact projects made sustainable by achieving tech excellence and great team dynamics"
- Received a Google Spot Bonus for "critical contributions to the efficiency of compact Gemini models"

Cambridge, MA

January 2022 - June 2024

Massachusetts Institute of Technology

POST-DOC

- Worked on algorithms for privacy-aware and efficient Machine Learning

Cambridge, MA

September 2021 - January 2022

JP Morgan

AI RESEARCH INTERN

- Developed sampling-based algorithms with regret guarantees for large-scale graph neural network training

New York City, NY

May 2021 - September 2021

Massachusetts Institute of Technology

TEACHING ASSISTANT FOR ADVANCED ALGORITHMS (6.854J / 18.415J)

- Conducted office hours to help students on problem sets and concepts covered in lectures; designed and graded assignments
- TA rating according to the official MIT subject evaluation report: 7.0/7.0

Cambridge, MA

Fall 2019

Microsoft, SAS Institute, University of North Carolina at Chapel Hill

Redmond, WA; Cary, NC; Chapel Hill,
NC

EARLIER INDUSTRY & TEACHING EXPERIENCE

2012 – 2015

- Shipped SQL Server compression optimizations and analytics tooling deployed across academic and enterprise users
- Led robotics and transportation research initiatives and created instructional content supporting UNC computer science programs

HONORS & AWARDS

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| 2024 | Google Spot Bonus , For critical contributions to the efficiency of compact Gemini models | Google |
| 2023 | Google Research Tech Impact Award , For contributions to ML efficiency techniques | Google |
| 2023 | NeurIPS Spotlight Paper , Alternating Updates for Efficient Transformers | NeurIPS |
| 2021 | Winner , MIT The Engine's Interval Program (one of two winning teams) | MIT |
| 2021 | Expert Reviewer , International Conference on Learning Representations | ICLR |
| 2021 | Expert Reviewer , International Conference on Machine Learning | ICML |
| 2020 | Expert Reviewer , International Conference on Learning Representations | ICLR |
| 2020 | Top 10% of Reviewers , Neural Information Processing Systems | NeurIPS |
| 2017 | RSS Best Paper Award , Robotics: Science and Systems Conference | RSS@MIT |
| 2015 | Carolina Research Scholar , University of North Carolina at Chapel Hill | UNC |
| 2015 | Finalist , CRA Outstanding Undergraduate Researcher Award | CRA |
| 2014 | Phi Beta Kappa , University of North Carolina at Chapel Hill | UNC |
| 2014 | Charles H. Dunham Scholarship , SAS-funded scholarship at UNC | UNC |
| 2014 | Dunlevie Honors Undergraduate Award , University of North Carolina at Chapel Hill | UNC |
| 2014 | Summer Undergraduate Research Fellowship , University of North Carolina at Chapel Hill | UNC |
| 2012–2015 | Honors Carolina , UNC Honors Program | UNC |
| 2011–2015 | Dean's List , University of North Carolina at Chapel Hill | UNC |

SELECTED PUBLICATIONS

EFFICIENT TRANSFORMERS & DISTILLATION

Alternating Updates for Efficient Transformers (Spotlight) [NeurIPS](#)
CENK BAYKAL, DYLAN CUTLER, NISHANTH DIKKALA, NIKHIL GHOSH, RINA PANIGRAHY, XIN WANG 2023

SLAM: Student-label Mixing for Distillation with Unlabeled Examples [NeurIPS](#)
VASILIS KONTONIS, FOTIS ILIOPOULOS, KHOA TRINH, CENK BAYKAL, GAURAV MENGHANI, ERIK VEE 2023

Robust Active Distillation [ICLR](#)
CENK BAYKAL, KHOA TRINH, FOTIS ILIOPOULOS, GAURAV MENGHANI, ERIK VEE 2023

Weighted Distillation with Unlabeled Examples [NeurIPS](#)
VASILIS KONTONIS, FOTIS ILIOPOULOS, CENK BAYKAL, GAURAV MENGHANI, KHOA TRINH, ERIK VEE 2022

MODEL COMPRESSION & PRUNING

SiPPing Neural Networks: Sensitivity-informed Provable Pruning of Neural Networks [SIAM SIMODS](#)
CENK BAYKAL*, LUCAS LIEBENWEIN*, IGOR GILITSCHENSKI, DAN FELDMAN, DANIELA RUS 2022

Lost in Pruning: The Effects of Pruning Neural Networks beyond Test Accuracy [MLSys](#)
LUCAS LIEBENWEIN, CENK BAYKAL, BRANDON CARTER, DAVID GIFFORD, DANIELA RUS 2021

Provable Filter Pruning for Efficient Neural Networks [ICLR](#)
LUCAS LIEBENWEIN*, CENK BAYKAL*, HARRY LANG, DAN FELDMAN, DANIELA RUS 2020

THEORY & FOUNDATIONS

A Theoretical View on Sparsely Activated Networks [NeurIPS](#)
CENK BAYKAL, NISHANTH DIKKALA, RINA PANIGRAHY, CYRUS RASHTCHIAN, XIN WANG 2022

Coresets for Support Vector Machines

CENK BAYKAL*, MURAD TUKAN*, DAN FELDMAN, DANIELA RUS

Theory of Computing Systems

2021

Data-Dependent Coresets for Compressing Neural Networks with Applications to Generalization Bounds

CENK BAYKAL*, LUCAS LIEBENWEIN*, IGOR GILITSCHENSKI, DAN FELDMAN, DANIELA RUS

ICLR

2019

ROBOTICS

Sampling-Based Approximation Algorithms for Reachability Analysis with Provable Guarantees

CENK BAYKAL*, LUCAS LIEBENWEIN*, IGOR GILITSCHENSKI, SERTAC KARAMAN, DANIELA RUS

Robotics: Science and Systems

2018

Asymptotically Optimal Design of Piecewise Cylindrical Robots using Motion Planning (Best Paper Award)

CENK BAYKAL, RON ALTEROVITZ

Robotics: Science and Systems

2017