

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

Cambridge, MA

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

2017-2021

- Research focus on sampling-based algorithms for efficient ML deployments; thesis: *Sampling-based Algorithms for Fast and Deployable AI*.
- Advised by Daniela Rus; completed a Mathematics minor in Probability in High Dimension.

Massachusetts Institute of Technology

Cambridge, MA

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

2015-2017

- Investigated algorithms for persistent autonomy and surveillance under Daniela Rus; thesis titled *Algorithms for Persistent Autonomy and Surveillance*.
- Developed stochastic planning methods adopted by the MIT CSAIL Computational Robotics Group.

University of North Carolina at Chapel Hill

Chapel Hill, NC

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

2011-2015

- Graduated with Highest Distinction while pursuing parallel CS and Mathematics degrees focused on robotics and optimization.
- Conducted honors thesis *Design Optimization Algorithms for Concentric Tube Robots* with advisor Ron Alterovitz.

EXPERIENCE

Two Sigma

New York City, NY

QUANTITATIVE RESEARCHER

July 2024 - Present

- 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

Google Research

Cambridge, MA

RESEARCH SCIENTIST

January 2022 - June 2024

- 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"

Massachusetts Institute of Technology

Cambridge, MA

POST-DOC

September 2021 - January 2022

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

JP Morgan

New York City, NY

AI RESEARCH INTERN

May 2021 - September 2021

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

Massachusetts Institute of Technology

Cambridge, MA

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

Fall 2019

- 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

- 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

2024	Google Spot Bonus , Critical contributions to the efficiency of compact Gemini models	Google
2023	Google Research Tech Impact Award , Recognized within Google Research for ML efficiency breakthroughs	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
2020	Top 10% Reviewer , Neural Information Processing Systems	NeurIPS
2017	Best Paper Award , Robotics: Science and Systems Conference	RSS@MIT
2011–2015	Selected Undergraduate Honors , UNC Distinctions: Carolina Research Scholar, CRA Outstanding Undergraduate Researcher finalist, Phi Beta Kappa, competitive scholarships	University of North Carolina at Chapel Hill

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

- Introduced alternating forward/backward scheduling that reduced inference latency for sparse transformers; Google Scholar: 3 citations (accessed September 21, 2025).

SLAM: Student-label Mixing for Distillation with Unlabeled Examples NeurIPS

VASILIS KONTONIS, FOTIS ILIOPOULOS, KHOA TRINH, CENK BAYKAL, GAURAV MENGHANI, ERIK VEE 2023

- Demonstrated unlabeled-target distillation with hybrid pseudo-labeling that cut annotation costs in half; Google Scholar: 7 citations (accessed September 21, 2025).

Robust Active Distillation ICLR

CENK BAYKAL, KHOA TRINH, FOTIS ILIOPOULOS, GAURAV MENGHANI, ERIK VEE 2023

- Coupled active learning with knowledge distillation to improve compact model robustness against label noise; Google Scholar: 11 citations (accessed September 21, 2025).

Weighted Distillation with Unlabeled Examples NeurIPS

VASILIS KONTONIS, FOTIS ILIOPOULOS, CENK BAYKAL, GAURAV MENGHANI, KHOA TRINH, ERIK VEE 2022

- Introduced importance-weighted student objectives for unlabeled corpora, yielding state-of-the-art compact transformers; Google Scholar: 13 citations (accessed September 21, 2025).

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

- Designed a sensitivity-aware pruning scheme with provable bounds that retained accuracy on language models; Google Scholar: 32 citations (accessed September 21, 2025).

Provable Filter Pruning for Efficient Neural Networks ICLR

LUCAS LIEBENWEIN*, CENK BAYKAL*, HARRY LANG, DAN FELDMAN, DANIELA RUS 2020

- Provided the first end-to-end guarantees for structural CNN pruning, inspiring broad adoption in efficient CNN research; Google Scholar: 190 citations (accessed September 21, 2025).

Lost in Pruning: The Effects of Pruning Neural Networks beyond Test Accuracy

MLSys

LUCAS LIEBENWEIN, CENK BAYKAL, BRANDON CARTER, DAVID GIFFORD, DANIELA RUS

2021

- Analyzed deployment-side regressions (latency, calibration) caused by aggressive pruning, motivating safer evaluation metrics; Google Scholar: 82 citations (accessed September 21, 2025).

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

ICLR

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

2019

- Developed dataset-aware coreset selection that yields compression with theoretical generalization guarantees; Google Scholar: 93 citations (accessed September 21, 2025).

CORESETS & THEORY

Coresets for Support Vector Machines

Theory of Computing Systems

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

2021

- Unified the streaming and distributed coreset constructions for SVMs; Google Scholar: 48 citations (accessed September 21, 2025). Extended version of the TAMC 2020 oral paper.