

Cenk Baykal

ML & QUANT RESEARCHER

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EDUCATION

Massachusetts Institute of Technology

Cambridge, MA

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

2017-2021

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

Massachusetts Institute of Technology

Cambridge, MA

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

2015-2017

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

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
- Thesis: *Design Optimization Algorithms for Concentric Tube Robots*
- Advisor: Ron Alterovitz

EXPERIENCE

Two Sigma

New York City, NY

QUANTITATIVE RESEARCHER

July 2024 - Present

- Designed systematic alpha strategies that leverage alternative data sources and advanced machine learning techniques
- Built and maintained research tooling to accelerate signal and forecast evaluation

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

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
- Conducted research in robotics, path planning, and enabling technologies

HONORS & AWARDS

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
2020–2021	Expert Reviewer , ICLR 2020–2021; ICML 2021	Various
2020	Top 10% of Reviewers , Neural Information Processing Systems	NeurIPS
2017	RSS Best Paper Award , Robotics: Science and Systems Conference	RSS
	Early Academic Honors , UNC distinctions including Carolina Research Scholar, CRA Outstanding	University of North
2011–2015	Undergraduate Finalist, Phi Beta Kappa, SAS Charles H. Dunham Scholarship, Dunlevie Honors Award, Summer Undergraduate Research Fellowship, Honors Carolina, Dean's List	Carolina at Chapel Hill

SELECTED PUBLICATIONS

TRANSFORMERS & DISTILLATION

Alternating Updates for Efficient Transformers	NeurIPS (Spotlight)
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
A Theoretical View on Sparsely Activated Networks	NeurIPS
CENK BAYKAL, NISHANTH DIKKALA, RINA PANIGRAHY, CYRUS RASHTCHIAN, XIN WANG	2022

COMPRESSION & ROBOTICS

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
CENK BAYKAL*, LUCAS LIEBENWEIN*, HARRY LANG, DAN FELDMAN, DANIELA RUS	2020
Data-Dependent Coresets for Compressing Neural Networks with Applications to Generalization Bounds	ICLR
CENK BAYKAL*, LUCAS LIEBENWEIN*, IGOR GILITSCHENSKI, DAN FELDMAN, DANIELA RUS	2019
Sampling-Based Approximation Algorithms for Reachability Analysis with Provable Guarantees	Robotics: Science and Systems
CENK BAYKAL*, LUCAS LIEBENWEIN*, IGOR GILITSCHENSKI, SERTAC KARAMAN, DANIELA RUS	2018
Asymptotically Optimal Design of Piecewise Cylindrical Robots using Motion Planning	Robotics: Science and Systems (Best Paper Award)
CENK BAYKAL, RON ALTEROVITZ	2017