

# Cenk Baykal

ML & Quant Researcher

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## Education

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### 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

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### 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 using agentic AI and LLMs to accelerate signal capture 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 Google Research Tech Impact Award (2023) and Spot Bonus (2024) for contributions to ML efficiency and compact Gemini models

### Massachusetts Institute of Technology

Cambridge, MA

Postdoctoral Researcher

September 2021–January 2022

- Worked on algorithms for privacy-aware and efficient machine learning

### J.P. Morgan AI Research

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

Earlier Industry & Teaching Experience

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

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	<b>Google Spot Bonus</b> – Critical contributions to the efficiency of compact Gemini models	Google
2023	<b>Google Research Tech Impact Award</b> – Contributions to ML efficiency techniques	Google
2023	<b>NeurIPS Spotlight Paper</b> – Alternating Updates for Efficient Transformers	NeurIPS
2021	<b>Winner</b> – MIT The Engine’s Interval Program (one of two winning teams)	MIT
2020–2021	<b>Expert Reviewer</b> – ICLR (2020, 2021); ICML (2021)	ICLR, ICML
2020	<b>Top 10% Reviewer</b> – NeurIPS	NeurIPS
2017	<b>RSS Best Paper Award</b> – Robotics: Science and Systems Conference <b>Early Academic Honors</b> – Carolina Research Scholar; CRA Outstanding Undergraduate	RSS
2011–2015	Finalist; Phi Beta Kappa; Charles H. Dunham Scholarship; Dunlevie Honors Award; SURF; Honors Carolina; Dean’s List	UNC Chapel Hill

## Selected Publications

For the complete list of publications, visit [Google Scholar](#).

### TRANSFORMERS & DISTILLATION

#### Alternating Updates for Efficient Transformers

Cenk Baykal, Dylan Cutler, Nishanth Dikkala, Nikhil Ghosh, Rina Panigrahy, Xin Wang

NeurIPS (Spotlight)

2023

#### SLaM: Student-Label Mixing for Distillation with Unlabeled Examples

Vasilis Kontonis, Fotis Iliopoulos, Khoa Trinh, Cenk Baykal, Gaurav Menghani, Erik Vee

NeurIPS

2023

#### Robust Active Distillation

Cenk Baykal, Khoa Trinh, Fotis Iliopoulos, Gaurav Menghani, Erik Vee

ICLR

2023

#### A Theoretical View on Sparsely Activated Networks

Cenk Baykal, Nishanth Dikkala, Rina Panigrahy, Cyrus Rashtchian, Xin Wang

NeurIPS

2022

### COMPRESSION & ROBOTICS

#### SiPPing Neural Networks: Sensitivity-informed Provable Pruning of Neural Networks

Cenk Baykal\*, Lucas Liebenwein\*, Igor Gilitschenski, Dan Feldman, Daniela Rus

SIAM SIMODS

2022

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

Lucas Liebenwein, Cenk Baykal, Brandon Carter, David Gifford, Daniela Rus

MLSys

2021

#### Provable Filter Pruning for Efficient Neural Networks

Cenk Baykal\*, Lucas Liebenwein\*, Harry Lang, Dan Feldman, Daniela Rus

ICLR

2020

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

Cenk Baykal\*, Lucas Liebenwein\*, Igor Gilitschenski, Dan Feldman, Daniela Rus

ICLR

2019

#### Sampling-Based Approximation Algorithms for Reachability Analysis with Provable Guarantees

Cenk Baykal\*, Lucas Liebenwein\*, Igor Gilitschenski, Sertac Karaman, Daniela Rus

RSS

2018

#### Asymptotically Optimal Design of Piecewise Cylindrical Robots using Motion Planning

Cenk Baykal, Ron Alterovitz

RSS (Best Paper Award)

2017