

# Cenk Baykal

ML & QUANT RESEARCHER

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## EDUCATION

### Massachusetts Institute of Technology

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

Cambridge, MA

2017–2021

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

### Massachusetts Institute of Technology

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

Cambridge, MA

2015–2017

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

### University of North Carolina at Chapel Hill

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

Chapel Hill, NC

2011–2015

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

## EXPERIENCE

### Two Sigma

QUANTITATIVE RESEARCHER

New York City, NY

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

RESEARCH SCIENTIST

Cambridge, MA

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

POST-DOC

Cambridge, MA

September 2021 – January 2022

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

### J.P. Morgan AI Research

AI RESEARCH INTERN

New York City, NY

May 2021 – September 2021

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

### Massachusetts Institute of Technology

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

Cambridge, MA

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

## EARLIER INDUSTRY &amp; 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      | <b>Google Spot Bonus</b> , For critical contributions to the efficiency of compact Gemini models   | Google                  |
| 2023      | <b>Google Research Tech Impact Award</b> , For 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   | Various                 |
| 2020      | <b>Top 10% of Reviewers</b> , Neural Information Processing Systems  | NeurIPS                 |
| 2017      | <b>RSS Best Paper Award</b> , Robotics: Science and Systems Conference   | RSS                     |
|           | <b>Early Academic Honors</b> , 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