ARCHAN RAY

Research Scientist | ML Theory, Randomized NLA, Sublinear Algorithms
github: archanray ◇ website: archanray.github.io ◇ New York, NY 11372
(413) · 992 · 9222 ◇ talk2archan@gmail.com

EDUCATION

University of Massachusetts, Amherst MA. Ph.D. in Computer Science. May 2024
Thesis: Sublinear Algorithms for Matrices: Theory and Applications. *Advised by* Cameron Musco

Indian Statistical Institute, Kolkata. M.Tech. in Computer Science. July 2015
Thesis: Estimation of Facial Emotions for Emotion Synthesis. *Advised by* Dipti Prasad Mukherjee

Jalpaiguri Government Engineering College, West Bengal. B.Tech. in Computer Science. June 2013

RESEARCH EXPERIENCE

Applied Research Scientist, JPMorganChase, New York, NY Sept 2024 - *present*

· Developed fast algorithms using NLA with applications in various machine learning problems (in NeurIPS 2025, PDSEC 2026, & arXiv [1, 2]). *Randomized & sublinear algorithms, machine learning.*
· Design and analysis of algorithms for transformer-based models (in TMLR 2026 & UAI 2026). *Deep learning, statistics.*

Graduate Research Assistant, University of Massachusetts, Amherst, MA May 2017 - June 2024

· Sublinear matrix-vector query methods for eigenvalue approximation [§4 of thesis report]. *Sublinear algorithms.*
· Eigenvalue approximation of symmetric matrices (in ICALP 2023 and Algorithmica [arxiv link]), symmetric matrix approximation in the spectral norm using deterministic algorithms (in ITCS 2024), and spectral density estimation (in SODA 2025). *Randomized and sublinear algorithms.*
· Matrix approximation and its applications in approximate text similarities (in AAAI 2022). *Sublinear algorithms, NLP.*
· Detect and recognize texts in historical maps (also created the database, published as technical reports [link to tech report 1], [link to tech report 2]). *Computer vision.*

Visiting Research Scholar, Indian Statistical Institute, Kolkata, India August 2015 - August 2016

· Detect and recognize objects from planogram images (in ECCV 2018, patented in 2020). *Computer vision, graph theory.*

ADDITIONAL EXPERIENCE

Postdoctoral Research Scholar, Sloan Kettering Institute, New York, NY Summer 2024

· Designed algorithms for matrix approximation with applications in clinical data. *NLA, randomized methods, optimization.*

Applied Research Intern, Amazon Web Services, New York, NY Summers 2019, 2020

· Designed an algorithm for pseudo semi-supervised learning for short texts. *Unsupervised learning, NLP.*
· Designed an algorithm for visual question answering using transformer architecture. *Computer vision, NLP.*

Research Intern, TCS Innovation Labs, Gurgaon, India Summer 2014

· Designed an algorithm for classification of images of human faces with emotions. *Computer vision, SVMs.*

Research Intern, Indian Space Research Organization (RRSC-E), Kolkata, India Summer 2012

· Designed an algorithm to identify distinct signals in a hyperspectral image. *Game theory, digital signal processing.*

HONORS AND ACHIEVEMENTS

Best Paper Award, 27th IEEE International Workshop on PDSEC May 2026

Dissertation Writing Fellowship, College of Information and Computer Sciences, UMASS-Amherst Spring 2023

AAAI-22 Student Scholarship, 36th AAAI Conference on Artificial Intelligence January 2022

Best Dissertation in M.Tech. Computer Science, Indian Statistical Institute, Kolkata July 2015

LEADERSHIP EXPERIENCES

University of Massachusetts, Amherst MA August 2016 - May 2024

· **Graduate Teaching Assistant**. TA for graduate ML, CV, algorithms, and data science courses.
· **Mentor**. CARE PhD Application Support Program; URV; Masters students at the UMASS CV Lab.
· **Co-organizing/Stewardship**. Machine Learning and Friends Lunch at UMass; Graduate Employee Organization.