

Computer Science

IN THIS ISSUE //

November 07, 2025 / Bulletin #8

Upcoming Seminars

CS Events

Northwestern Events

News

IMPORTANT DATES & REMINDERS

Monday, November 10, 2025 Winter Quarter Registration Begins

Wednesday, November 26, 2025 University Offices Close at 5:00 pm for
Thanksgiving Break

Friday, December 5, 2025 Master's Completion Form Due for Fall Master's
Candidates

Monday, December 8, 2025 Fall Exams begin

Monday, December 15, 2025 Grades due 3:00 PM

Friday, December 19, 2025 Fall 2025 Degrees Conferred

Wednesday, December 24, 2025 Winter Recess Starts - University Closed
Through January 1st, 2026

We want to hear from you!

Please send any upcoming news and events to

**news@cs.northwestern.edu to be included in future bulletins &/featured
on our socials/website.**

Events for the bulletin must be emailed by Thursdays 12PM to be in that Friday's bulletin.

Missed a seminar? No worries!
View past seminars via the Northwestern CS Website
(northwestern login required).

[View Past Seminars »](#)

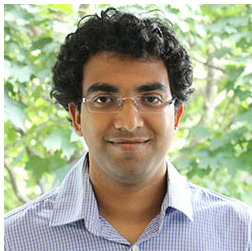
UPCOMING SEMINARS

November

3rd - Aloni Cohen
10th - Aravindan Vijayaraghavan
17th - Shaddin Dughmi
19th - Robert Rand

January

5th - Ari Holtzman
12th - Rana Hanocka



Toward a Modern Theory of Algorithms in the Machine Learning Era

Aravindan Vijayaraghavan, Northwestern University

Abstract

The remarkable empirical successes of machine learning have revealed the power of computational techniques in several domains and scientific disciplines. Yet there is a striking disconnect in the algorithmic foundations of machine learning: many basic computational problems, ranging from classification and clustering to deep learning, reduce to non-convex optimization tasks that are computationally intractable in the worst case. Yet, in practice, heuristics often succeed in producing high-quality solutions, fueling the remarkable progress of modern AI. At the same time, the absence of

rigorous guarantees raises the following question: when, and under what conditions, can we reliably use predictions of machine learning models?

In the first part of the talk, I will describe theoretical frameworks like smoothed analysis that go beyond worst-case analysis to better reason about algorithms on typical instances, and help obtain rigorous polynomial time guarantees for challenging algorithmic problems in ML and high-dimensional data analysis. In the second part of the talk, I will present recent principled approaches that treat machine learning models as powerful black boxes that are potentially unreliable or biased, and show how to design algorithms that can rigorously quantify and account for their uncertainty.

Biography

Aravindan Vijayaraghavan is an Associate Professor at Northwestern University in the department of Computer Science, and (by courtesy) Industrial Engineering and Management Sciences. He is also the co-director of the NSF Institute for Data, Econometrics, Algorithms and Learning (IDEAL). His research interests are broadly in algorithms and foundations of data science and machine learning.

🕒 **Monday, November 10, 2025**
12:00 PM - 1:00 PM CT

Lunch is available from 11:30AM

📍 **Mudd Hall, 3514,**
2233 Tech Drive, Evanston, IL 60208

[More Information »](#)



A Combinatorial Lens on Supervised Learning

Shaddin Dughmi, USC

Abstract

I will describe some recent joint results on the theory of supervised learning which follow from surprising connections to combinatorial optimization. Most notably, by connecting learning to bipartite matching on infinite graphs we derive several algorithmic and structural characterizations of learning which hold somewhat broadly.

Biography

"**Shaddin Dughmi** is an Associate Professor in the Department of Computer Science at USC and the Neild visiting professor at Northwestern University. He received a B.S. in computer science, summa cum laude, from Cornell University in 2004, and a Ph.D. in computer science from Stanford University in 2011. He is a recipient of the NSF CAREER award, the Arthur L. Samuel best doctoral thesis award, and the ACM EC best student paper award. Shaddin is broadly interested in questions that stimulate the development of new algorithmic techniques, and shed insight on the power and limitations of algorithms. Work in his group has investigated such questions in a variety of domains: game theory, mechanism design, multi-agent systems, persuasion and information design, delegation and contract theory, decision making subject to online or stochastic uncertainty, and the theory of machine learning."

🕒 **Monday, November 17, 2025**
12:00 PM - 1:00 PM CT

Lunch is available from 11:30AM

📍 **Mudd Hall, 3514,**
2233 Tech Drive, Evanston, IL 60208

[More Information »](#)



Quantum Programming in Qunity

Robert Rand, University of Chicago

Abstract

Qunity is a high-level functional language for writing quantum programs in the style of OCaml or Haskell. Qunity treats classical and quantum data equivalently, allowing us to run the same programs on classical data and

quantum superpositions. It takes key concepts from classical programming, like pattern matching, try-catch blocks, and data duplication and lifts them to the quantum setting. In this talk, I will describe Qunity, along with recent extensions that enable easier classical and pure quantum programming, and its compiler to quantum circuits.

Biography

Robert Rand is an Assistant Professor of Computer Science at the University of Chicago. His research focuses on programming languages and verification for quantum computing and his main projects include the Qunity quantum programming language, the BellKAT DSL for quantum networking, and VyZX, a verified ZX calculus library. He also works on a range of verification projects, from adding automation to the Rocq proof assistant to developing quantum program logics. Robert developed and maintains the INQWIRE QuantumLib, an open-source library for verified quantum computing in Rocq, which underlies many of his projects including his online textbook, Verified Quantum Computing.

🕒 **Wednesday, November 19, 2025**
12:00 PM - 1:00 PM CT

Lunch is available from 11:30AM

📍 **Mudd Hall, 3514,**
2233 Tech Drive, Evanston, IL 60208

[More Information »](#)

CS Department Events

IDEAL WORKSHOP ON METRIC EMBEDDINGS, HIGH DIMENSIONAL GEOMETRY, VECTOR DATABASES

This one-day workshop, which is part of the Fall 2025 IDEAL Special Program on High Dimensional and Complex Data Analysis, will explore the interplay between metric embeddings, high-dimensional geometry, and algorithmic problems in data science and theoretical computer science. Topics include geometric and probabilistic methods for understanding metric spaces, embeddings with low distortion, and the implications of high-dimensional

phenomena for efficient computation and data representation. The workshop will bring together researchers from mathematics, computer science, and related areas to foster exchange across these connected fields.

🕒 **Friday, November 14, 2025**
9:00 AM - 4:00 PM CT

📍 **Mudd Hall, 3514,**
2233 Tech Drive, Evanston, IL 60208

Register Now »

CS STUDY ABROAD INFO SESSION

We'll be holding an info session on all things study abroad (and how it relates to CS requirements) on Tuesday, November 18th at 5:30 PM Central over Zoom. This is particularly targeted at students who might be interested in Study Abroad but don't know anything about it.

We'll have Sara McGuinn from the NU Global Learning Office with us, as well as a few of your peers who have studied abroad in the past to share their experiences with you.

You can get a preview of CS study abroad information here: <https://cs-nu.github.io/nu-cs-study-abroad/NU-CS-study-abroad-policy.pdf>

🕒 **Wednesday, November 18, 2025**
05:30 PM CT

📍 **Virtual via Zoom**

Zoom Link »

BAGEL THURSDAY

CS Community! Join us for our monthly free bagels and coffee while mingling with fellow faculty and students.

🕒 **Thursday, November 20, 2025**
09:00 AM - 11:00 AM CT

📍 **Mudd Hall, 3514,**
2233 Tech Drive, Evanston, IL 60208

Other Events

N'TANGLED W/ HEAD OF QUANTUM COMPUTING FROM PASQAL

We are excited to welcome **Dr. Heejeong Jeong**, Head of Quantum Computing in the US, from Pasqal.

About Pasqal:

Pasqal builds programmable quantum simulators and quantum computers made of 2D and 3D atomic arrays. They develop the lasers, the vacuum technology, the electronic controls, and the software stack to make the individual atoms accessible to quantum programmers worldwide. With four decades leading and mapping the revolution, they're here to help you power up the next phase of your development.

N'Tangled is **INQUIRE**'s networking initiative connecting **Quantum Information Science and Engineering (QISE) students and postdocs** for collaboration and professional growth.

Join us for an afternoon of networking, collaboration, and discovery!

Event Details:

Date: Monday, November 10

Time: 3:00 – 4:30pm

Location: Tech J Wing Atrium (**J205**)

RSVP: **N'Tangled w/ Pasqal – Nov. 10**

This **free** event is designed for **QISE students and postdocs** looking to connect, collaborate, and grow professionally.

Agenda Highlights:

1. **N'Troduction** – N'Tangled Leadership
 - a. **Kate Smith + Ryan Young**, N'Tangled leadership
2. **Company Presentation** – Pasqal
 - a. **Heejeong Jeong**, Head of Quantum Computing US
3. **Q&A w/ Pasqal** – Hosted by Kate Smith
4. **Reception**

Don't miss out on this exciting chance to engage with the QISE community!

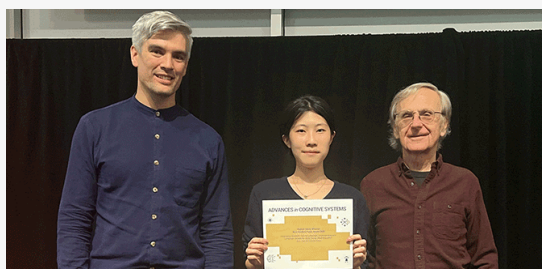
Refreshments will be provided.

🕒 **Monday, November 10, 2025**
3:00 PM - 4:30 PM CT

📍 **Technological Institute, J205, 2145 Sheridan Road, Evanston, IL 60208**
[map it »](#)

[More Information »](#)

CS News



PhD Student Kexin Zhao Wins Best Student Paper Award at ACS 2025

Zhao and Professor Ken Forbus demonstrated the effectiveness of combining symbolic and neural methods for word sense disambiguation.

[Read More](#)



PhD Student Spotlight: Payal Mohapatra

Mohapatra's goal is to design robust deep learning frameworks capable of adapting to practical sensing scenarios in healthcare, continuous sensing, and audio domains.

[*Read More*](#)



Connie Chau, Ziyi Guo, and Gefei Tan Earn 2025 Global Google PhD Fellowships

The 2025 Global Google PhD Fellowships recognize 255 outstanding graduate students across 35 countries who are conducting innovative research in computer science and related fields.

[*Read More*](#)



Northwestern Department of Computer Science
Mudd Hall, 2233 Tech Drive, Third Floor
Evanston, Illinois 60208

[Manage My Preferences](#) [Unsubscribe](#)