

Computer Science

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IMPORTANT DATES & REMINDERS

Tuesday, October 13, 2026 Last day for full term withdrawals to receive 75% refund

Friday, October 23, 2026 Application for degree due to The Graduate School to receive a degree in Fall

Monday, November 9, 2026 Pre-registration for Winter 2027 begins

Wednesday, November 25, 2026 Thanksgiving Vacation begins at 6:00 PM

Monday, November 16, 2026 Regular registration for Winter quarter begins

Saturday, December 5, 2026 Fall classes end

Saturday, December 12, 2026 Fall exams end

Friday, December 18, 2026 Winter registration for new TGS students and most Evanston graduate programs

Thursday, December 24, 2026 Winter Recess Starts - University Closed
Through January 1st, 2027

We want to hear from you!
Please send any upcoming news and events to **cs-news@northwestern.edu** to be included in future bulletins, on our socials and/or website.

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

[View Past Seminars »](#)

UPCOMING SEMINARS

October

5 - Brian Suchy
6 - Harry Wang
14 - Yuhao Zhu
21 - Anima Anandkumar
28 - Aaron Shaw

November

4 - Haoqi Zhang
9 - Mohit Bansal



Google Relational Modeling Framework: Proving Relational Equivalence at Scale

Brian Suchy, Software Engineer Google DeepMind

Abstract

GenAI is accelerating computer science in nearly every way. From development and research to deployment, AI has the potential to enable huge sweeping changes to engineering workflows along the entire computing stack; however, to truly realize the potential for this, we must build the foundations for these workflows to be able to operate

autonomously with minimal human intervention.

One of these building blocks, Google Relational Modeling Framework (GRMF), generalizes relational logic, including GoogleSQL, Common Expression Language (CEL), Datalog, and (conditionally) NumPy/Pandas, into a unified Relational Algebra-based Dialect. In this talk, we dive into one of GRMF's use cases of enabling sound, deterministic verification by formally proving equivalence between relational statements. We examine the inner workings of multi-layered formal proving methods (ranging from e-graphs and k -semirings to SMT solvers like Z3/CVC5) and detail real-world production use cases. Finally, we explore future applications of GRMF, including automated cross-engine query migration (e.g., BigQuery $\rightarrow$ F1), JIT compilation of SQL queries, execution of NumPy programs via F1/Voxel, and its potential as a general MLIR query optimizer

Biography

Brian Suchy is a Senior Software Engineer at Google DeepMind. He works in several areas including: hardware development, formal verification, and (of course) AI.

Brian graduated with his PhD from Northwestern in 2017. He worked in the Prescience Lab, led by Dr. Peter Dinda, with a focus on Software-based Memory Management

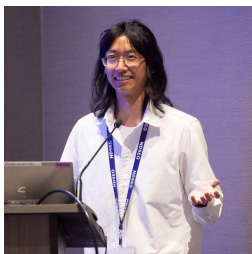
Research Interests

Databases, Architecture, Formal Logic

🕒 **Monday, October 5, 2026 | 12:00 PM - 1:00 PM CT**

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

[More Information »](#)



Houston, We Have a Problem: Systems Challenges of Large Scale Spacecraft Deployments

Harry Wang, Columbia University

Abstract

The collapsing cost of space launches has disrupted the way satellites are deployed, shifting the industry from a model of a few expensive fault-tolerant high-orbit satellites to arrays of commodity low-cost SmallSats in low-Earth orbit. However, satellite software hasn't kept up with the hardware trends, and missions are still using the ad-hoc flight software infrastructure built for expensive one-off missions in high-altitude orbits, even as constellations of tens or even hundreds of SmallSats come online. This motivates new approaches rooted in verification and language design.

In this talk, I present Orbital, which extends eBPF's symbolic execution to derive tight worst-case execution time bounds for hard real-time multi-tenant scheduling on SmallSats, and Radshield, a programming model that efficiently replicates execution and protects commodity hardware from radiation-induced silent data corruption. I'll also

discuss ongoing work with NASA-JPL to adapt WebAssembly as the onboard command DSL for their flight software framework, and open problems at the intersection of software systems and space that this community is well-positioned to tackle.

Biography

Haoda Wang is a PhD candidate at Columbia University developing software systems for spacecraft. Previously, he has worked on flight software for the Mars Perseverance rover, and developed mission-critical tools that run onboard commodity chips in the high-radiation environment. He is also a 2024 NSF GRFP fellow and a 2022 DoD NDSEG fellow.

Research Interests

software systems, programming languages

🕒 **Tuesday, October 6, 2026 | 11:00 AM - 12:00 PM CT**

📍 **Technological Institute, Tech F281,
2145 Sheridan Road, Evanston, IL 60208**

[More Information »](#)



Programming and Architecting Heterogeneous Physical Intelligence: A Sensing-Computing-Human Co- Optimization Approach

Yuhao Zhu, University of Rochester

Abstract

Future computers will be integrated into embodied systems that operate in complex real-world environments, such as autonomous robots and smart wearable/Extended Reality (XR) glasses. These systems must continuously sense and interpret the physical world while also generating information that engages human perceptual and cognitive systems.

This talk argues that programming and architecting future computer systems must integrate sensing and human cognition into the computing stack, and presents my lab's work toward this vision. First, I will discuss the co-design of sensing and computation, where we design novel computational image sensors and compile visual programs across heterogeneous sensing and computing hardware. Second, I will discuss co-optimizing computing with humans, where we build computational models of human visual perception, which provides perceptual, not numerical, specifications and constraints for navigating the enormous design space of visual programs. Together, these projects point toward an exciting future of computing that jointly reasons about machines, the physical world, and human cognition.

Biography

Yuhao Zhu is an Associate Professor of Computer Science, Brain and Cognitive Sciences,

and an Asaro Biggar Family Fellow in Data Science, all at University of Rochester, where he and his students are mostly drawn to research problems at the intersection of computer architecture, compilers, sensing, and human factors. With his collaborators and students, he has won multiple IEEE Micro Top Picks in Computer Architecture for "novelty and potential for long-term impact", along with best paper awards/nominations at MICRO, HPCA, ASPLOS, and IEEE VR.

Research Areas

Computer architecture, graphics, imaging

🕒 **Wednesday, October 14, 2026 | 12:00 PM - 1:00 PM CT**

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

[More Information »](#)

CS Department Events

CS TECH TALK: SOFTWARE ENGINEERING WITH AI: THE ELEPHANT GOLDFISH MODEL BY BRIAN SUCHY

Abstract:

Modern large language models (LLMs) have fundamentally accelerated the velocity of code generation, yet they introduce a critical reliability failure mode: when code generation becomes instantaneous, human architectural judgment and comprehension are frequently bypassed. Without rigorous intent capture, developers inadvertently mass-produce subtle bugs, accumulate unmaintainable structural complexity, and struggle with session context collapse.

This talk presents the Elephant-Goldfish Model (EGM), an operating framework that shifts software engineering with AI from prompt-and-pray code generation to disciplined, design-driven systems development. EGM decouples long-horizon architectural exploration from verification through two distinct agent paradigms: the context-rich Elephant (used to deliberate, refine trade-offs, and synthesize exhaustive design specifications) and the stateless Goldfish (isolated, zero-context LLM instances deployed to ruthlessly audit design documents for hidden assumptions, architectural vulnerabilities, and implementation readiness). By establishing design documents and modular component documentation (Peanuts & Hay) as primary engineering artifacts, implementation is reduced from speculative invention to bounded transcription.

Finally, the talk demonstrates how multi-agent swarms automate this critique pipeline, turning human engineers into high-leverage architectural supervisors while enforcing that comprehension scales alongside velocity.

Biography:

Brian Suchy is a Software Engineer at Google DeepMind. He graduated with his PhD from Northwestern in 2022. He worked with the Prescience Lab group led by Dr. Peter Dinda and worked on Compilers, Architecture, and Operating Systems.

Research Area(s)/Interest(s): Artificial Intelligence, Query Processing, Architecture, and Formal Logic

 **Monday, October 5, 2026 | 4:00 PM - 5:00 PM CT**

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

[More Information »](#)

IDEAL FALL 2026 KICKOFF EVENT

Reinforcement learning (RL) is a fundamental approach for addressing how agents learn and make decisions over time from observed data in dynamic and uncertain environments. RL is rooted in work on Markov Decision Problems (MDPs), dynamic programming, and optimal control which have a long history of trans-disciplinary applications in areas such as engineering, economics and operations research. It extends the simpler bandit framework that captures the explore-exploit dilemma in a non-changing environment, where the theoretical foundations are better understood. While the more recent integration of deep learning into RL (so-called deep RL) has led to remarkable successes, theoretical foundations for these approaches are often lacking and needed, in particular as one seeks to expand the application of RL to new settings such as those involving multiple agents or human-in-the-loop control.

This special program will host a series of events addressing both areas seeing recent theoretical advances and areas with strong practical impact in need of firmer foundations. It will draw on topics such as the challenges of RL and control in robotics, theoretical challenges such as efficiency, operating in continuous time, and distinctions between offline and online learning, recent ideas and advances in decision transformers, goal conditioned RL, and world models, and agentic systems and other applications of MARL such as wireless networking, power systems, industrial process control, and understanding algorithmic collusion.

🕒 **Friday, October 9, 2026 | 8:00 AM - 05:00 PM CT**

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

[More Information »](#)

Other Events

REGISTRATION NOW OPEN FOR THE 2026 IIN ROSEMARY SCHNELL SYMPOSIUM

Light activates nanoparticles inside tumors, drives chemical reactions without heat, and allows scientists to image living tissue at cellular resolution without ever making a cut. On Thursday, October 15, 2026, the International Institute

for Nanotechnology (IIN) brings together six of the world's foremost nanoscientists for a full day of transformative talks, rigorous exchange, and cross-disciplinary energy that has always defined the IIN.

The 2026 IIN Rosemary Schnell Symposium takes place at the Hilton Orrington Hotel in Evanston, Illinois. This year's program features researchers who have redefined what is possible in their areas of science, spanning nanophotonics, synthetic biology, single-molecule imaging, biomedical nanomaterials, and flexible electronics.

🕒 **Thursday, October 15, 2026**
08:30 AM - 05:30 PM CT

📍 **Hilton Orrington**
1710 Orrington Ave, Evanston, IL 60201

[More Information »](#)

Awards



Congratulations Mike Rubenstein

Selected for
inaugural Chief of
Naval Research
Fellowship
program.

Award Detail



Congratulations Manling Li

RAGEN-2 received the Best Paper Award at CVPR workshop on Multimodal Reasoning for Agentic Intelligence.

[***Award Detail***](#)

CS News



Northwestern Computer Science Announces New Named Professorships

Branden Ghena was named the McCormick Advisory Council Professor and Joshua DeAndria was appointed as the Pioneer Professor of Practice.

[***Read Full Article***](#)



Alum Spotlight: Lukas Gross ('20)

As a member of OpenAI's technical staff, Gross has worked on a variety of projects across the company, most recently developing tools that help lawyers focus on their most consequential work.

[***Read Full Article***](#)



Northwestern Engineering Names Winners of 2026 Cole-Higgins Awards

Gina Fong, Branden Ghena, Colin Hisey, and Suzanne Olds received teaching awards, while Greg Wagner earned the advising award.

[Read Full Article](#)



Northwestern Department of Computer Science
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