

EDUCATION

M.S. in Mathematics | Loyola University Chicago

Spring 2025

Coursework: Differential Geometry (Guillemin & Pollack); Functional Analysis (Bachman); Topology (Munkres); Real Analysis II (Rudin); Optimization (Guenin); Game Theory (Barron); Automata & Formal Languages (Sipser)
GPA: 3.89/4.0

B.S. in Theoretical Physics, Mathematics | Loyola University Chicago

Spring 2015

Selected coursework: Quantum Mechanics (Griffiths); E&M (Griffiths); Mechanics (Thornton & Marion); PDEs (Brezis); Complex Analysis (Saff & Snider); Real Analysis I (Rudin)
Major GPA: 3.76/4.0

RESEARCH

Asymptotic Limits of Nonlocal Curvature for Curves | LUC (B. Seguin)

2023 - Present

- Recovered classical curvature under appropriate asymptotics of nonlocal curvature for sufficiently regular curves in \mathbb{R}^n .
- Derived explicit asymptotics for circles and used geometric properties of canal surfaces to show that the nonlocal curvature of an arbitrary curve can be locally approximated by that of a circle.
- Presented at the AMS Sectional Meeting on Nonlocal Analysis and Geometric Measure Theory (Albany, 2024).
- Manuscript in preparation.*

Supernova Photometric Contamination Studies | ANL (S. Kuhlmann, J. Cunningham)

2013 - 2015

- Reduced false-positive Type Ia identifications by ~30%.
- Investigated contamination of photometrically-selected Type Ia supernova samples by core-collapse supernovae using SNANA simulations and SALT2 parameter-space selection. Identified misclassified SNcc events and applied SNCosmo template-fitting with various characteristic lightcurves ([code](#)).
- Presented at [NCUR](#) (2014), [CAURS](#) (2015), and [AAS 225](#) (2015).

AWARDS & DISTINCTIONS

Father Gerst Memorial Award Excellence in Physics | LUC

2015

Award established in 1965 in honor of Fr. Francis J. Gerst, S.J., former Chair of Mathematics and Dean of the Graduate School; presented to students in the physics program for outstanding academic excellence in physics.

Interdisciplinary Honors Program | LUC

2012 - 2015

Completed Loyola's Interdisciplinary Honors Program, a selective, competitive, intensive curriculum emphasizing analytical and communication skills, international and interdisciplinary perspectives, and high academic performance (including additional honors coursework and GPA requirements).

IAS Undergraduate Summer School | PCMI

2014

Competitively selected participant in the [IAS/PCMI Undergraduate Summer School](#), an intensive program featuring advanced mathematical lectures by leading researchers. The program culminated in my presentation on the [Dirichlet problem](#), explaining how minimization of the associated energy functional yields solutions to Poisson's equation.

INDUSTRY

My work focuses on applying programming-language & information-theoretic analysis to optimization problems.

Meta | Software Engineer | AI Software Platform

Jan 2024 - Present

- Scaled MI300 GPUs across Meta's fleet by updating algorithms to match Nvidia-class performance and accuracy.
- Improved [Triton](#) kernel performance on MI300 hardware by exploiting architecture-specific features.
- Expanded and stabilized Triton's frontend to simplify GPU kernel authoring.

Adyen | Staff Software Engineer | Mobile + POS Terminals

May 2023 - Dec 2023

- Founding engineer in Adyen's first U.S. office; strengthened the site's engineering influence.
- Drove org-wide best practices, unified Mobile & POS Terminals via shared APIs, and established strong product–engineering communication workflows.

Spotify | Senior Software Engineer | iOS Performance

Apr 2022 - Jan 2023

- Enhanced iOS startup instrumentation and system-level diagnostics, improving observability and app reliability.
- Developed Early Quality Tests to identify subtle and hard-to-detect performance regressions.

Snap | Senior Software Engineer | iOS Performance, CI Infrastructure

May 2020 - Feb 2022

- Built local and production performance instrumentation adopted by dozens of teams.
- Improved app startup time by 5–10% through targeted I/O optimizations.
- Designed and implemented Python-based CI infrastructure to improve testing, reliability and debuggability.

Facebook | Senior Software Engineer | iOS + Android Performance

May 2017 - May 2020

- Delivered 5–40% CPU, I/O, and startup performance improvements across large-scale mobile systems through profiling-guided optimizations, bytecode analysis, and AOSP on-device PGO.
- Designed and implemented Objective-C and Android bytecode compiler optimizations, including Obj-C++ codegen fixes ([D41050](#), [D59873](#)) and debug-info reductions that cut binaries by 4–20%.
- Built large-scale performance modeling frameworks (clustering + regression) to analyze system behavior and guide engineering decisions.

Arity | Application Developer | iOS

Jul 2016 - May 2017

- Used PLT techniques to enable experimentation of algorithms in driving-behavior app used by tens of thousands of users.

StageBloc / Fullscreen | Mobile Developer | iOS

Jul 2016 - May 2017

- Built and maintained production iOS social, shopping, and SVOD applications serving thousands of users.

Google | Software Engineer | iOS

Aug 2015 – Jan 2016

- Implemented flight and sports cards for the iOS Google Now feature team, used by hundreds of thousands of users.

BEYOND

Skills

Python (NumPy, SciPy, Matplotlib, PyTorch, Triton); C/C++; CUDA / GPU Programming; Parallel & High Performance Computing; Linux; Git; Mathematica; \LaTeX ; differential-geometric & variational techniques; asymptotic and measure-theoretic methods.

Interests

CAD modeling; 3D printing; mechanical mechanisms; neuroscience, philosophy, math, physics literature; kickboxing; rock climbing; coffee; contemporary art; documentaries; book club.