Dan **Zimmerman**, MS

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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)*

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)*

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.