Nicholas M. Synovic

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Education

- **Ph.D in Computer Science** — Aug 2024 – Present

Loyola University Chicago

- **M.S in Computer Science – *Concentration in A.I.*** — Aug 2022 – May 2024

Loyola University Chicago

- **B.S in Computer Science** — Aug 2018 – May 2022

Loyola University Chicago

Experience

Research Assistant — Jan 2020 – Present

Loyola University Chicago, Dept. of Computer Science

- Execute, analyze, and disseminate empirical research on pre-trained deep neural network models (PTMs) and their associated software supply chains, contributing to a multi-institution research team with seven peer-reviewed publications at premier international conferences.
- Spearhead and coordinate the documentation, upgrading, and acquisition of software, networking equipment, and infrastructure for the department's research cluster computing system, standardizing configurations and validating performance for faculty and student research.
- Teach, mentor, and guide undergraduate and graduate researchers in empirical software engineering methods, including research ideation, experimental design, software implementation, reproducibility practices, and scientific publication in the context of AI for Science.
- Collaborate with teaching faculty to design, develop, and deliver new course materials on generative AI, software engineering, and applied machine learning, supporting curriculum modernization and student skill development.
- Co-authored and submitted NSF grant proposals with research faculty to acquire research instrumentation supporting computational natural science, AI research, and graduate/undergraduate education.

Ph.D. Summer Research Assistant — May 2025 – Aug 2025

Argonne National Labs, Argonne Leadership Computing Facility

- Developed and engineered benchmarking pipelines with the Operational Data Analytics team to evaluate and validate database management systems (DBMS) for in-flight data analytics on current and emerging exascale computing architectures, enabling data-driven performance insights for next-generation HPC workflows.
- Collaborated with laboratory stakeholders in an Agile workflow, scoping, presenting, and delivering solutions to user stories while ensuring alignment with scientific computing requirements and system-integration constraints.
- Authored, coordinated, and submitted NSF grant proposals on research security, supporting multi-institution collaborations between Loyola University Chicago and Purdue University and contributing to federal research-funding strategy.
- Presented, published, and disseminated research findings at SuperComputing '25, communicating technical contributions to the HPC and operational data-analytics communities.

oneAPI Deep Learning Student Ambassador — May 2024 – Oct 2025

Intel Corporation

- Collaborated with Intel's Student Outreach team to design, develop, and deliver hands-on technical workshops throughout the Chicagoland area, educating students and community members on the Intel® oneAPI deep-learning technology stack and its capabilities for heterogeneous AI computing.
- Authored and published technical blogs and social-media content that analyzed, communicated, and visualized the advantages of oneAPI for computer vision, generative AI, and cross-architecture performance portability, expanding community awareness and developer adoption.
- Tested, evaluated, and diagnosed issues in pre-release Intel hardware and software, validating performance, stability, and correctness prior to public release and facilitating feedback loops between early testers and engineering teams.

Graduate Summer Research Assistant — May 2023 – Aug 2023

Argonne National Labs, Argonne Leadership Computing Facility

- Researched and engineered provenance methodologies using national-scale supercomputing resources to analyze and trace the evolution of adapted pre-trained deep neural network models (PTMs).
- Devised and evaluated new strategies for processing, empirically comparing, and validating PTM variants across heterogeneous AI accelerator architectures.
- Educated and coordinated undergraduate and graduate researchers in heterogeneous high-performance computing (HPC), AI accelerator workflows, and advanced software-engineering practices, standardizing hands-on training to improve researchers' efficiency and experimental rigor.
- Developed, authored, and published empirical software-engineering research that examined and classified PTM development histories, usage patterns, and engineering characteristics, contributing new insights to academic conference proceedings.

IS/IT Developer Analyst — May 2021 – May 2022

Medline Industries, Inc.

- Developed and deployed internal business applications using Oracle DBMS, OutSystems and internal APIs, architecting database-backed workflows for talent identification and workforce planning leveraged by over 30,000 employees.
- Collaborated closely with cross-functional IT and HR stakeholders, standardizing Agile development practices and ensuring each application met functional requirements, performance expectations, and end-user needs.
- Diagnosed and resolved production issues while providing 24/7 on-call operational support, validating system stability and minimizing business downtime across multiple mission-critical applications.

Skills

- Software engineering for LLMs on national and industry heterogeneous high-performance resources platforms with Python, C++, TensorFlow, and PyTorch
- Experienced with MySQL, PostgreSQL, Firebase, and SQLite databases, data pipelines, and full-stack applications
- TDD and requirements-oriented software engineering practitioner
- Proficient in Java, Python, C, C++, SYCL, HTML, CSS, JavaScript, and Linux shell scripting
- Business, technical, and scientific written and verbal communication that fosters and facilitates cross-organization team collaboration
- Independently driven while maintaining communication and promoting application ownership within diverse teams
- Efficient translation and requirements engineering of business goals into actionable tasks
- Detailed and correctness-oriented mindset that critically questions analyzes, and tests results