

NICHOLAS TAPP - HUGHES

🔗 nicholastapphughes.com | 📩 nicholas.tapphughes@gmail.com | 💬 Nick Tapp-Hughes | 🌐 tapphughesn

Full-Stack Engineer focused on building high-quality, scalable, and trustworthy web and data applications that meet stakeholder needs. Experienced working directly with end users on ambiguous problems to deliver solutions.

EXPERIENCE

Software Developer

Epic Systems Corp., July 2023–July 2025

- Improved screening follow-up workflows for 80+ hospital systems (driven by customer feature requests) by architecting a configurable system that enables automatic follow-up care suggestions based on screening insights.
- Drove 20% performance gain (measured by realistic experimentation) and UX improvements in 2 application components by migrating them from Visual Basic to .NET/C# and React.
- Wrote 2 technical designs, presented to customers, and collected user feedback for an LLM-extracted insights project which resulted in earlier diagnosis for 70% of lung cancer cases at The Christ Hospital.
- Shipped 62 bug fixes to 500+ healthcare systems by tracing logs and diagnosing issues across the full stack.
- Collected feedback/pain points, built trust, and facilitated installs during 20 days spent on-site with end users.
- Ensured reliability and maintainability by using test suites, analyzing performance, and favoring simple design.
- Built front-end React applications that are accessible to non-sighted users and available in 9+ languages.

Graduate Student Researcher

UNC Computer Science, Aug 2021–May 2023

- Published a 22% improvement in autism classification accuracy on a 3D mesh hippocampus dataset by developing new methods for extracting interpretable statistical features of 3D objects (*Journal of Math. Imaging and Vision*).
- Boosted research lab productivity by maintaining our open-source Python/C++ repo, developing scripts for orchestrating experimentation, cleaning datasets, and introducing visualization tools.

Graduate Research Assistant

UNC Gillings School of Global Public Health, Aug 2021–Jun 2025

- Improved policymakers' understanding of smoking behavior in the US adult population by building a microsimulation model that predicts year-over-year smoking behavior at the individual level.
- Accelerated the project team's productivity and synchronization by maintaining the codebase, building robust data pipelines, sharing regular results, recommending technologies, and onboarding new people.

Software Engineering R&D Intern

Sila Nanotechnologies Inc., Jun 2022–Aug 2022

- Improved physical measurement accuracy in chemical R&D processes by enhancing a proprietary computer vision pipeline, writing documentation, and advising future development strategy.

PROJECTS & SYSTEMS BUILT

Evolutionary Skeletal Representations Algorithm

An algorithmic pipeline for determining salient statistical features of 3D mesh objects using skeletal representations and differential geometric processing. Implemented with Python, C++, and shell scripts; released as open-source.

Smoking Behavior Microsimulation Model

A simulation of individual lifetime smoking behavior, for the entire US adult population, built with Python. Based on a 2nd-order Markov chain multinomial logistic regression model. Predicts smoking behavior, mortality, and incidence of disease based on individual and societal factors. Accompanied by large-scale data analysis.

Nick Tapp-Hughes's Blog

A personal website and blog built using React and hosted on AWS/Cloudflare. Uses an Amplify/DynamoDB/Lambda/SES cloud stack + Python/Bash scripting to support verified subscribers, automatically convert Google Docs to HTML blog posts, and mitigate security risks such as email enumeration or DoS.

SELECTED PUBLICATIONS

- Pizer, S. M., Liu, Z., Zhao, J., **Tapp-Hughes, N.**, Damon, J., Zhang, M., Marron, J. S., Taheri, M., Vicory, J., *Interior Object Geometry via Fitted Frames*, *Journal of Mathematical Imaging and Vision*. Available: <https://rdcu.be/eFX0G>.
- Mills, S. D., **Tapp-Hughes, N.**, Zhang, Y., Ribisl, K. M., Wiesen, C. A., et. al., *Development and Validation of the TwIST Model*, *PLoS One*. Available: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0342083>.

SKILLS

Languages: Python, TypeScript, C++, Java, C#, SQL, Rust

Frameworks & Tooling: AWS, .NET, React, SQL Server, Testing, Debugging, Build Systems, Containerization, uv, neovim

Other: Machine Learning Research, Software Development Lifecycle, Linux, System Design, LLMs, Agile, Open Source

EDUCATION

University of North Carolina at Chapel Hill

B.S. Applied Mathematics, B.S. Computer Science

- Cumulative GPA: 3.92/4, Math GPA: 3.87/4, CS GPA: 3.97/4

M.S. Computer Science

Aug 2017–May 2021

Aug 2021–May 2023