NICHOLAS TAPP - HUGHES

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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 (according to 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 (measured by user feedback) 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 using 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 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.
- Published in PLoS One and presented at Society for Research on Nicotine and Tobacco.

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

Automated Follow-Up Suggestions for Screening Procedures
A system for automatically suggesting follow-up care based on insights from screening exams (e.g. for breast/lung/colon/cervical cancer) or general radiology. Follow-up care suggestions are flexibly configured by hospital administrators, and are based on the type of screening as well as insights from the screening.

Smoking Behavior Microsimulation Model
A 2nd order Markov chain multinomial logistic regression model simulating the smoking behavior of individuals over the course of their lifetimes, scaled up to the entire US adult population. 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 a Amplify/DynamoDB/Lambda/SES cloud stack + local 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
Other: System Design, Data Structures & Algorithms, ML/AI Research, Bug-Fix Lifecycle, Code Review, Linux, Safety-Critical Systems, Software Design Patterns, Accessibility, Documentation, Data Processing & Analysis

EDUCATION

University of North Carolina at Chapel Hill

B.S. Applied Mathematics, B.S. Computer Science *Aug 2017–May 2021*

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

M.S. Computer Science *Aug 2021–May 2023*