Matthew C. Davis   Curriculum Vitae, August 2023

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RESEARCH & WORK INTERESTS

My industry background encompasses twenty years building and managing complex business-critical software systems. This experience includes coding parts of large systems, architecting and designing business-critical systems, designing processes, managing software projects, integrating applications and supply chains, and managing globally distributed teams, including software engineers. It includes less glamorous but vital aspects of delivering software solutions: datacenter infrastructure, compute, storage, power, environmental, disaster recovery, cybersecurity, physical security, identity management, networks, load balancers, endpoints, user support, telecom, etc.

My research interests are focused on software engineering and human computer interaction within the context of humans building useful software. What would the last 20 years of software security look like without C and C++ memory safety errors causing a large percentage of software vulnerabilities? Reducing security, reliability, and predictability friction within our languages, tools, and systems provides some of the best avenues available to impact our software-driven world today.

Software improves our lives in innumerable ways. Software can be better and the best way to do that is by improving our languages, tools, and interfaces. If we repeatedly improve these 1%, the benefit multiplied across thousands of projects is impactful.

EDUCATION   -   **Ph.D., Software Engineering** (in-process; expected graduation: 2025)
                      Carnegie Mellon University School of Computer Science, 4.0 GPA
                 -    **Non-degree-seeking Mathematics Student**
                      North Carolina State University, 4.0 GPA
                 -    **M.Sc., Software Engineering** (research track)
                      East Carolina University, 4.0 GPA
                 -    **BA, Computer Information Systems**
                      Lenoir-Rhyne University

PAPERS   -   **Matthew C. Davis**, Sangheon Choi, Sam Estep, Brad A. Myers, and Joshua
                      Sunshine. "NaNofuzz: A Usable Tool for Automatic Test Generation." In
                      Proceedings of the 31st ACM Joint European Software Engineering Conference
                      and Symposium on the Foundations of Software Engineering, 2023. (accepted;
                      preprint: https://cmumatt.github.io/assets/NaNofuzz_2023.pdf)
                 -    **Matthew C. Davis**, Emad Aghayi, Thomas D. LaToza, Xiaoyin Wang, Brad A. Myers,
                      Joshua Sunshine. "What's (not) Working in Programmer User Studies?"
                      Transactions on Software Engineering and Methodology. 2023.
                      https://dl.acm.org/doi/10.1145/3587157
                 -    **Matthew C. Davis** and Mark Hills. "Escaping the Clone Zone: Java Runtime-
                      Managed Snapshots Current and Future Work." Southeastern Regional
                      Programming Language Seminar. Paper & Talk. 2019.
                      http://www.cs.ecu.edu/hillsma/publications/davis-hills-2019-serpl.pdf

- **Matthew C. Davis**. "Applying Mutable Object Snapshots to a High-level Object-Oriented Language." M.Sc. Thesis. 2018. http://thescholarship.ecu.edu/handle/10342/7032
- **Matthew C. Davis**. "A Student's Perspective of a Capstone Course**"** (Software Engineering Team Dynamics). 14th Annual CCSC Regional Conference. https://dl.acm.org/doi/10.5555/369274.369349

HONORS   Various Division Cash Awards, Corning, Inc.
Corning Software Process Excellence Award
Lenoir-Rhyne University Junior Award
Lenoir-Rhyne University Man of the Year Award
Phi Beta Lambda State Leadership Conference
- State Award – 1st Place Website
- State Award – 1st Place Telecommunications
Phi Beta Lambda National Leadership Conference
- National Award – 2nd Place Website
- National Award – 2nd Place Computer Concepts
- National Award – 3rd Place Emerging Business Issues

MENTORING   Undergraduate Mentees
- Amy Wei (University of Michigan)   (2023)
- Sangheon Choi (Rose Hullman Institute of Technology)   (2022-2023)

TEACHING   **17-214/514: Principles of Software Construction**   (2023)
Head TA. Seven sections, >100 students (mix of graduate and undergraduate), two instructors (Dr. Jonathan Aldrich and Dr. Bogdan Vasilescu). Included lectures, leading grading, and managing a team of 13 TAs. https://cmu-17-214.github.io/s2023/

TALKS AND PANELS
- "Academia vs. Industry" Seminar Talk   (2023)
- Invited Panel: NSF CSGrad4US   (2023)

GRANTS AND AWARDS
- CyLab Seed Funding: Usable Test Generation for Security   (2023)

INDUSTRY EXPERIENCE
Shurtape Technologies, LLC
Director, Global Technology Infrastructure and Operations   (2014-2021)
Deliver "always on" global business-critical software systems including app stack, databases, network, datacenter, compute, storage, security, endpoints, and helpdesk.
- Operate two datacenters: compute, storage, network, power, cooling, DR, IAM, security.
- Operate global business critical software systems in a 24x7 high-availability landscape
- Manage full life-cycle end-user services: helpdesk, field services, reverse logistics, app and desktop virtualization, PCs, Macs, printers, phones, mobile devices, policies, etc.
- Manage global network encompassing facilities on three continents including wireless, LAN, WAN, SD-WAN, NAC, security, and a private SMF metro fiber ring.
- Responsible for roadmaps, strategy, budget, and leading change across the environment. A cost-conscious leader, I seek smart long-term opportunities to streamline operations, improve reliability and performance, and direct investment to high-value priorities.

- Manage strategic vendor relationships including contracts and negotiations, ensuring accountability and remediation, setting and managing budget and timelines.
- Deliver executive communications informally and in formal settings with meaningful messages in everyday language. Frequently regarded as a "top speaker" by executives.

Exhibited key traits necessary in this role: flexibility, persistence, persuasion, partnership, professionalism, long-range planning, candor, and a persistent positive attitude

Director, Network and Data Center   (2012-2014)
Same as above minus end user services and SAP basis operations.

Manager, E-Commerce   (2009-2012)
Hired to solve a difficult problem for the CEO and CIO: the company planned to purchase a large carve-out divestiture of a global CPG company. This would require integrating numerous challenging retailers, vendors, and 3PLs -- in short order and in concert with an ERP migration. Both knew the existing in-house technoloy and team were not up to the challenge.

The team I built engineered a new software stack using a combination of off-the-shelf and custom software to integrated Wal-Mart, Target, Lowe's, carriers, vendors, 3PLs, and many other leading retailers. This coincided with a back-end ERP change and a net decrease in headcount without issues.

The company has successfully expanded its business using this platform and team for the last ten years.

Corning, Inc.
Supply Chain Applications Technical Lead   (2004-2009)
Full-cycle SAP implementation core team experience at a global Fortune 500 company
- Led dev team implementing SAP Product Configuration, including full EDI integration
- Led dev team implementing re-designed integration solution for new SAP back-end
- Recruited, selected, evaluated, and managed contingent labor to augment internal staff
- Managed timelines, budgets, scope, and deliverables. Provided hands-on leadership
- Mentored team, advocated design, adapted, and maintained solution integrity
- Designed business processes, reports, interfaces, conversions, and subsystems
- Configured pricing, output, copy control, texts, credit, batch jobs, ports, and partners
- Provided support, training, troubleshooting, and maintenance for SAP and integrations
- By the post-go live stages, my role's scope expanded to include cross-module initiatives across North America encompassing any combination of SD, LE, MM, PP, WM, FI, and CO
- Worked closely to lead a team of on- and off-shore developers during this timeframe
- During this period, I was frequently writing and deploying code in Java, ABAP, COBOL, and CL with back-end databases including Oracle, MySQL, and DB2

Senior Applications Analyst   (2002-2004)
- Led implementation of web-based product configurator
- Led software development team to build and successfully deploy configurable pricing engine using Java, Oracle, XML, JEP, Tomcat. This flexible and custom system had a long life and remained in active use long after I left Corning.
- Pricing engine included a novel, intuitive interface for product management to easily define pricing rules for complex, configurable products using a formula engine.
- Site lead for IT ISO 9001 implementation. Externally audited w/no site non-conformities.
- Provided support for Configurator, Pricing, EDI, ERP, and Cable Data Sheets systems.

Applications Analyst   (2001-2002)
- Implemented consignment and vendor managed inventory software system projects with complex and demanding customers such as AT&T, Bell Canada, and Verizon.
- Configured and coded new functionality across multiple modules of ERP system
- Created XML schemas and XSLT transformations to present Cable Data Sheets to end-users in a familiar PDF

format on the web using a Java-based Formatting Objects Processor. (emerging technology at the time)

- Implemented numerous new or enhanced integrations with Fortune 50 companies allowing automation of manual business processes such as consignment processing and order entry.
- Maintained, enhanced, and supported ERP software interfaces as part of a team.

Programmer   (2000-2001)

I had not yet graduated from university and balanced full-time work with finishing my degree.

- Through hard work and methodical knowledge acquisition, successfully supported the business software system, implementing new functionality, and solving problems.
- Developed and maintained high-profile integrations into and out of the ERP system. (i.e., those with customers, suppliers, and financial institutions)
- Documented and improved existing processes. Created new processes as needed and drove process standardization and improvement within the team.

Information Technology Intern   (1999-2000)

I worked as an IT intern while studying at university. This involved solving technology problems for several hundred people, up to and including the CEO. During this time, I started an internal monthly technology news magazine that received positive feedback within the company, documented and improved our team processes, and trained new interns and co-ops. During this time, I received frequent recognition from users via the company's recognition program.

Lenoir-Rhyne University

Information Technology Intern   (1998-1999)

While at University, I worked in the IT department. My duties were helping people who called the help desk, maintaining PC inventory, and updating the University website. One of my early tasks was putting the academic catalog online for the first time since I had web experience.

SBC Development

Independent Software Developer   (1994-1999)

During High School and University, I developed software systems and utilities. Some were freeware, some were shareware, and others were published via BMT Micro in Wilmington, NC. Software included:

- McList (a mailing list processor reviewed favorably by c't magazine in 1997)
- stree (ranked #8 best online utility by a Japanese-language IDG publication in 1999)
- McD-CBV (popular call-back verifier for AdeptXBBS)
- Mail Center Professional (SMTP and POP3 mail server), etc.

People and organizations around the world used this software, and I enjoyed working with and supporting them. My largest customer was a Canadian government agency, the Ontario Ministry of Housing, which used the McList system to distribute building code proposals and changes to a large base of stakeholders and constituents.