David G. White, Ph.D.

Résumé

2411 Dowd Ln.
Austin, TX 78728
+1 (540) 525-1497
dgwhite11@gmail.com

dave-white.github.io | GitHub: dave-white | LinkedIn

Synopsis

- **Widely adept IT professional holding a Ph.D. in mathematics**, seeking a role to integrate scientific expertise with proficiency in programming and other computing technology.
- Profound understanding computer systems plus familiarity with a broad array of programming languages and paradigms, development frameworks and Unix environment configuration.
- Advanced knowledge in numerous mathematical fields, both continuous and discrete, with a proven capacity for intense study and research.
- Assiduous management of projects, data and code through version control and other organizational tools.

Experience

2023-2025 **IT Security Consultant**, *atsec information security corp.*, Austin, TX

Validation of compliance to FIPS 140-3 requirements as part of the Cryptographic Module Validation Program (CMVP).

- Performed code review of software written in C/C++ and Rust as well as hardware description in SystemVerilog.
- Reported on cryptographic module security on the basis of code review, physical and functional testing, and analysis of clients' documentation.
- Trained by NIST-certified experts on the specifications and implementation of cryptographic algorithms such as AES (and its approved modes), SHA and Keccak, RSA, ECDSA, hash-based signature schemes, Diffie-Hellman, DRBGs and the post-quantum module-lattice-based algorithms, as well as on statstical analysis of entropy sources.
- Co-directed new-hire training.
- Individual development efforts:
  - Rust library serving as a bridge between a testing application, written in C, and the driver of a hardware security module, written in Rust.
  - Docker container furnishing a complete environment for cross-compiling the above Rust library.
  - C-code test harness module, wrapping the Mbed TLS cryptographic API. Documented using Doxygen.
  - Python implementation of the client in NIST's Automated Cryptographic Validation Protocol (ACVP). Handles SSL client certificates, TOTPs, JSON Web Tokens and paginated results.
  - `jq` and POSIX shell scripts for processing JSON files.

2024 (intermittent) **Volunteer private consulting**, *Supporting academic research*, Austin, TX

Assisted in environment configuration for and debugging of numerical linear algebra software experiments, implemented in MATLAB, Python, C++ and Fortran, and run on a high-performance computer. Specific activities include:

- Compiled a project which utilizes cuBLAS, Nvidia's CUDA-accelerated linear algebra API.
- Set up a remote-shell development environment through Linux Environment Modules and shell `rc` scripts, ensuring correct versions of toolchain components are loaded into the file system and utilities such as GNU Screen start up at login.
- Used `gdb` within MATLAB to debug MEX binaries built from OpenMP-parallelized Fortran and C++ code.
- Generated visualizations of experimental data via Matplotlib.
- Configured Conda environments supplying versioned dependencies of Jupyter projects for specific processor architectures.

Aug.-Dec. 2022 **Research Program Associate**, *Simons Laufer Mathematical Sciences Institute*, Berkeley, CA

Member of a collaborative research program on Floer homotopy theory. Participated in activities of the concurrent program on gauge theory.

2017-2023 **Graduate Research & Teaching Assistant**, *NC State Dept. of Mathematics*, Raleigh, NC

- Instructor of record for courses in multivariable calculus and in topics from discrete mathematics.
- Administered distance-education courses in geometry, differential equations and linear algebra.
- Teaching assistant for several calculus courses.

2015–2016 **Associate Software Developer**, *iPipeline, Inc.*, Exton, PA

Bux fixing and new-feature development on an application consuming parameters posted from a web portal, performing actuarial calculations based on various client-specific rules and models, and writing the results to a PDF "illustration" of the changing values over time associated with insurance products.

- Web UI development in Javascript, CSS and HTML.
- Server-side development in VB.NET and C#, as well as debugging in PostScript.
- Wrote SQL scripts and stored procedures for testing.
- Experience with project managment, especially issue tracking, in Jira.
- Automated deployment and integration testing with Microsoft IIS.

2011–2013 **Senior Developer & Systems Architect**, *BPM Specialists, Inc.*, Alpharetta, GA

- Pega-certified Senior Developer & Systems Architect.
- Second lead developer on project team, with a pronounced mentoring role withing the overall organization.
- Directly collected and documented business requirements from clients and translated them into technical specifications.
- Developed Java-based RESTful web services driven by business rules engines for clients such as Wells Fargo and TSYS.

EDUCATION

2017–2023 **Ph.D. – Mathematics**, *North Carolina State University*, Raleigh, NC

Advised by Tye Lidman. My dissertation studies an application of Floer theory to low-dimensional topology and knot theory, drawing upon the fields of

- symplectic geometry,
- gauge theory,
- algebraic topology
- algebraic geometry,
- functional analysis,
- category theory.

2016-2017 **Post-baccalaureate study**, *University of North Carolina at Charlotte*, Charlotte, NC

2007–2011 **B.A.**, *Duke University*, Durham, NC

Double major: philosopy and mathematics.
Awards: Dean's List, Spring 2008.

SERVICE

Jan.-Aug. 2024 **Volunteer instructor**, *Texas Prison Education Initiative (TPEI)*, Austin, TX

Delivered credit-bearing UT Austin courses on to incarcerated students at the TDCJ Coleman Unit, Lockhart, TX:

- Guest lecturer on topology for course *Mathematics in Art*.
- Teaching assistant for precalculus course.

Jun. 2021 **LaTeX + Vim Workshop**, *NC State AMS chapter*, Raleigh, NC

Led a multi-session workshop on authoring LaTeX in Vim.

COMPETENCIES

Computing

Languages	C/C++, Rust, Java, Python, Javascript/Typescript, Perl, PHP, Lua, POSIX shell, SQL, Fortran, Haskell, VB, C#, TeX, PostScript, (System)Verilog
Development frameworks	MATLAB, Maple, Mathematica, TensorFlow (w/ Keras), `scikit-learn`, PyTorch, CUDA, NumPy, SymPy, SciPy, pandas, SageMath, Macaulay2
Build tools	GCC, Clang, GNU Make, CMake, Ninja, Cargo
Version control	Git, Subversion
Utilities	`awk`, `sed`, `gdb` / `lldb`, dracut, `jq`, SSH, Tmux/GNU Screen, GPG
Other tools & platforms	Jupyter, Conda, Docker, Doxygen, spreadsheet and other "office" applications
Personal projects	• Completed the Titanic Tutorial and "House Prices - Advanced Regression Techniques" machine learning compentition on Kaggle. • C program executing Git commands on all git repos beneath a specified point in the file tree.

Mathematics

Beyond my doctoral research, I have studied scholarly literature and attended academic conference talks covering the following topics in the fields of applied topology and numerical linear algebra:

- persistent homology,
- directed homotopy theory,
- matrix compression,
- fast direct solvers,

Languages

English	Native	
French	Advanced	*Proficient reader; intermediate to advanced listening comprehension; developing speaker. Advanced undergraduate-level coursework (2019).*
German	Intermediate	*Intermediate-level reader; basic listening comprehension and speaking skills. Advanced undergraduate coursework (2007).*