

Samuel D. V. Stephens

Department of Bioengineering and Neurology
School of Medicine
Stanford University

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EDUCATION

- 2026– **B. S. in Mathematics**, Salem State University, Salem, Massachusetts.
- 2019–22 **High School Diploma, Pre-Law Track**, Judge Barefoot Sanders Law Magnet, Dallas, Texas.
Graduated with Honors, Distinction, and a Distinguished Level of Achievement per the Texas Education Agency. Coursework included dual credit and 13 AP exams.

APPOINTMENTS AND RESEARCH EXPERIENCE

Research Positions

- 2026– **STANFORD UNIVERSITY**
Assistant Researcher, Department of Bioengineering and Neurology, School of Medicine
Continuing the CICADAS-BOOGALOO line of work begun at BIDMC/HMS toward real-world clinical use; introduced personalized adaptive thresholds based on SOFA scores and age, and advancing implementation against EEG and the MORGOTH large-scale ICU epileptic dataset. The joint methods paper that grounds this work is currently being prepared for submission (target venues include *IEEE Transactions on Biomedical Engineering* and *Journal of Neural Engineering*).
- 2025– **BETH ISRAEL DEACONESS MEDICAL CENTER & HARVARD MEDICAL SCHOOL**
- 2026– *Assistant Researcher, Department of Neurology*
New lab; PI and project scope being finalized. Held concurrently with the Stanford appointment.
- 2025–2026 *Assistant Researcher, Department of Neurology*, under Dr. M. Brandon Westover
Developed CICADAS' (Causal Inference for Critical-Care Anti-Seizure Treatment with Disease Dynamics, Automated PKPD/Trial Simulation, and Survival Optimization) successor, BOOGALOO: methodological frameworks that recover unbiased causal treatment effects from observational ICU data, with PKPD-aware modeling for diseased patients.

Independent and Collaborative Research

- 2024– **INDEPENDENT MATHEMATICAL RESEARCH**
Self-directed Independent Researcher
Foundational work on polyadic algebraic structures via extensions of classical group theory
- 2022–24 **THE UNIVERSITY OF TEXAS AT DALLAS**
Unpaid Research and Literature Review Collaborator, under Dr. Abdi
Meta-analysis on the Bouba-Kiki effect in children with Misophonia and/or Autism Spectrum Disorder

Pre-College Research and Internships

- 2021–22 **SCHOOL FOR HEALTH PROFESSIONS, DALLAS**
Student Researcher, Microbiology Department, under Dr. Harrington (high-school research)
Identified novel functions of bacteria in the gut microbiome of *Z. atratus* relevant to low-density polyethylene and polystyrene biodegradation
- 2021–22 **CITY OF DALLAS**
Dallas City Council Research Intern, District 11 (high-school internship)
Researched smart-city development initiatives under the supervision of the city manager and Council Member 11

ADDITIONAL EDUCATION

- 2026 **MASSACHUSETTS INSTITUTE OF TECHNOLOGY**
Coursework in Bioengineering (Audit)
20.205[[J]: Principles and Applications of Genetic Engineering for Biotechnology and Neuroscience
- 2025–26 **HARVARD UNIVERSITY**
Coursework in Mathematics (Audit)
Studies in Algebra and Group Theory (55a); Studies in Real and Complex Analysis (55b); Critical Theory (89)
- 2025 **WABASH COLLEGE**
Coursework in Mathematics, Neurobiology, and Music
Complex Analysis; Non-Fiction Creative Writing; Linguistics; Sociolinguistics; Principles of Neuroscience; Organ Performance
- 2024 **INSTITUTE FOR SOCIAL ECOLOGY**
Coursework in Sociology and Social Ecology
Legacies of Environmental Radicalism
- 2024 **THE UNIVERSITY OF TEXAS AT DALLAS**
Coursework in Mathematics (Audit)
Combinatorics; Advanced Calculus
- 2023–24 **KENYON COLLEGE**
Coursework in Mathematics, Philosophy, Political Science, and Music
Abstract Algebra I; Contemporary Mathematics Seminar; Symbolic Logic; Philosophy of Natural Science; Piano Practicum; Violin Practicum; Quest for Justice; STEM Research Methods

RESEARCH AREAS AND INTERESTS

Biostatistical and simulation methods for critical-care medicine: causal inference, pharmacokinetic/pharmacodynamic modeling, and survival optimization

Mathematical physics and algebraic foundations: polyadic algebraic structures, polyadic semigroups, and possible extensions to Lie polyadic algebras for differential equations

Philosophy of natural science: Hempel’s models of scientific explanation with classical Aristotelian logic replaced by non-classical logics

Education philosophy, politics of education, and political philosophy; post-post modernism

Neurobioengineering and cognitive science

PUBLICATIONS

Books and Textbooks

- 2025–26 Samuel D. V. Stephens. *Math 55A Textbook*. Harvard College, Harvard University. In use as supplemental material for future Math 55a courses.

Manuscripts in Preparation

- 2025–26 Samuel D. V. Stephens, Tara Westover, Sahar Zafar, M. Brandon Westover. “CICADAS-II BOOGALOO: Modifying the CICADAS Simulation-Based Randomized Trial Emulation to Accommodate Infrequent Events and Dosing.” Beth Israel Deaconess Medical Center with Harvard Medical School. Preparing for submission; target venues include *IEEE Transactions on Biomedical Engineering* and the *Journal of Neural Engineering*.
- 2024– Samuel D. V. Stephens, John Cervantes. “Collaborative Manuscript in Political Philosophy.” Inter-institutional collaboration with a Northeastern University researcher; exploring intersections of political theory, educational theory, and ethics.

Musical Arrangements

Selected arrangements with publicly available sheet music and accompanying recordings; some works published under the pseudonym *Czyzew*, *Dr. Grmmmm*, and *Viktor Alexandre Saint-Yves d'Alveydre*. Catalog of works soon to be available at samuel-stephens.com.

Ground after John Eccles — solo piano arrangement (A-flat minor, 3/4) on a recurring baroque bass figure

Couplets de folies after Marin Marais — harp arrangement

Étude d'Exécution Transcendante No. 1: Grande Étude en Fa Mineur after Henselt — solo piano (under *Czyzew*)

Étude d'Exécution Transcendante No. 2 after Henselt — solo piano (under *Czyzew*)

Armide, LWV 71 after Jean-Baptiste Lully — arrangements of select sections

Chamber Concerto in D minor, RV 96 after Vivaldi — available openly online; here is the sheet music.

Online Essays and Commentary

Hosted at samuel-stephens.com/blog. Selected posts:

- 2026 “Trump and Freud.” A psychoanalytic and critical-theoretic reading of the political base of Donald Trump.
- 2025 “Notes on Polyadic Algebraic Structures.” Preliminary thoughts on extending classical group theory through changes in operation adicity for a general audience/ layperson.
- 2025 “Hobbes and Leviathan.” Commentary on Hobbbes’ political philosophy, anthropological philosophy, philosophy of mind, and political theology.
- 2025 “My Neovim + $\LaTeX$ Workflow.” On real-time lecture note-taking with Neovim, UltiSnips, and custom automation.
- 2026 “The Penguin.” Reflections.

Online Mathematical Notes and Coursework

Published openly at samuel-stephens.com/notes; course numbering inspired by MIT. Companion videos under the YouTube handle @Vichaama.

- ongoing *Math 55a: Studies in Algebra and Group Theory* (full notes, with companion full-text PDF in the **uni** repository)
- ongoing *Math 55b: Studies in Real and Complex Analysis*
- ongoing *Integrated Mathematics* (pre-algebra through pre-calculus; with number theory, probability, graph theory, set theory)
- ongoing *Single-Variable Calculus*
- ongoing *Multivariable Calculus*
- ongoing *Biology* (molecular biology, cell biology, genetics, biochemistry)
- ongoing *Critical Theory* (Frankfurt School: Lukács, Horkheimer, Adorno, Habermas, and beyond)

TECHNICAL PROJECTS

- 2023– **uni** — Academic Workflow Automation Platform. Lead Developer. github.com/sdvstephens/uni

Built an integrated, terminal-based academic workflow as a single Python CLI (**acad**, exposed through a **uni** fish-shell wrapper) consolidating course management, lecture and problem-set scaffolding, grade and GPA tracking, and a live status dashboard, in daily personal use across coursework, audits, and tutoring

Generates lecture and problem-set documents in both Org-mode and $\LaTeX$ from the command line, with master-file assembly, plain **pdf_latex** via **latexmk** against a shared preamble, and an Ipe figure-insertion pipeline driven from first-class **neovim**/vimtex integration

Integrated with Taskwarrior and Timewarrior for deadline-aware, time-tracked course management surfaced through the dashboard

Stores course metadata, grades, and notes as human-readable JSON under Git version control

Published as a FOSS project under MIT — **pipx install acad-cli**; **sdvstephens/acad-cli** — inspired by the late Gilles Castel

2025— **rmpp-stabilizer** — Stroke stabilization for the reMarkable Paper Pro. Sole developer. *Repository currently private; will be published once stable.*

Implemented as an **LD_PRELOAD** shared library (C++, MIT licensed) that intercepts evdev pen input before **xochitl** processes it, smoothing handwritten input in real time to reduce jitter in mathematical notation and diagram sketching

Configurable smoothing algorithms: moving-average, Gaussian-weighted, Krita-style *string pull*, and the One Euro filter (Casiez et al., 2012); a clean-room reimplement informed by Krita's open-source stabilizer (GPL-2.0)

Docker-based aarch64 toolchain for reproducible builds against the reMarkable's embedded Linux environment

2025— **rmpp-wikipedia** — Offline Wikipedia client for the reMarkable Paper Pro. Sole developer. *Repository currently private; will be published once stable.*

Qt/QML reading UI on the device that talks over loopback HTTP to a small native **zimserver** backend (aarch64, built on Kiwix **kiwix-tools** and **libzim**) so a full **.zim** Wikipedia snapshot on USB/SD can be browsed entirely offline

Designed for low-power E Ink reading: works alongside **xochitl** via a Qt resource-rebuilder integration

2024— **BetterCanvas** — Safari Web Extension for Canvas LMS. Sole developer. *Repository currently private; will be published once stable.*

Native Safari Web Extension (Xcode/Swift host app plus a Safari extension target) that improves the day-to-day Canvas LMS reading and submission workflow on macOS and iOS/iPadOS

2025— **cicadas2** — Reference implementation supporting the CICADAS-II BOOGALOO manuscript and the Stanford research program. Lead developer. *Repository currently private; will be published with the manuscript.*

End-to-end simulation framework for non-convulsive seizures in the ICU, modeling the full pipeline from a synthetic patient through latent disease dynamics, pharmacokinetics/pharmacodynamics, sparse Poisson seizure observations, real-time state estimation, treatment strategies, and a daily-hazard mortality model

Two complete implementations: MATLAB reference (the original) and a verified Python port (NumPy/SciPy), each with a full pytest/MATLAB cross-fixture test suite that locks numerical equivalence

Implements an Extended Kalman Filter on the log-rate state, one-compartment PK with infusion and bolus dosing, Hill/linear PD suppression, five treatment strategies (including adaptive variants), and parametric *g-formula* recovery of causal treatment effects from confounded observational data

Includes the LaTeX manuscript draft, a reproducibility harness that regenerates every reported number, and a figure-generation pipeline in both MATLAB and Python

Directly grounds the Stanford appointment: the SOFA/age-personalized adaptive-threshold extension being implemented at Stanford against EEG and MORGOTH datasets builds on this framework

GRANTS AND AWARDS

Awards and Honors

2025	Honors and Dean's Scholar, Wabash College
2023	KEEP-STEM Scholar, National Science Foundation and Kenyon College
2020	AP Capstone Scholar, The College Board
2019	AP Scholar with Distinction and Honors, The College Board

COURSES TAUGHT

Independent

Open mathematics curriculum project designed for self-paced learners and aligned with a crude and rudimentary approximation of a “Humboldtian dialectical” educational philosophy and a structural-mathematics approach inspired by the failures of 1960s *New Math*. Companion worksheets, problem sets, and lecture notes published at samuel-stephens.com; video lectures released openly under the YouTube handle @Vichaama. Lecture content is bullet-point scripted in $\text{\LaTeX}$ during a planning stage before recording. Recording and upload are pending; the curriculum itself is the current deliverable.

Basic Mathematics (ongoing) — structural treatment of arithmetic, algebra, and elementary number theory across three parts: Arithmetic as Structure, Algebraic Foundations, and Number Theory & Patterns

Integrated Mathematics I (planned) — algebra (linear systems, polynomials, quadratics, rationals, radicals, and complex numbers), Euclidean and coordinate geometry with transformations as group actions, three-dimensional geometry, and a number-theory strand running from divisibility through modular arithmetic and CRT

Integrated Mathematics II (planned) — single-variable calculus from limits through series, an introductory linear algebra strand, and a first formal pass through abstract algebra, with structure used to unify the three strands

Integrated Mathematics III (planned) — proof-based real analysis (construction of the reals, sequences and series, continuity and differentiation, Riemann integration with a glimpse of Lebesgue), abstract algebra (rings, fields, Galois theory), and onward to complex analysis and point-set topology

PROFESSIONAL EMPLOYMENT

2025	1832 Brew at Wabash College, Crawfordsville, Indiana Part-Time Barista
2024	Walgreens, Dallas, Texas Sales Representative
2024	Fossil Group, Inc., Dallas, Texas Stylist and Sales Expert
2023	Nordstrom, E-Bar Coffeehouse, Dallas, Texas Summer Barista

Updated August 2026