Samuel D. V. Stephens

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EDUCATION

2026– **B. S. in Mathematics and Music**, Salem State University, Salem, Massachusetts. Current GPA: 4.00. Coursework: Graduate Measure Theory (directed study, Folland's *Real Analysis*); Philosophy of Politics and Society; Neuropsychology; American Romanticism; Piano Performance.

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– **Mass General Brigham**
Assistant Research Intern, Department of Neurology
Large-scale real-data phase of the CICADAS project (CICADAS-III), using MGB computing resources for large ICU EEG and clinical datasets. The framework was first run on real patient records in October 2026.

2026– **Stanford University**
Assistant Researcher, Department of Neurology, School of Medicine
Continuing the CICADAS-II 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 under major revision at the *Journal of Neural Engineering*.

2025–26 **Beth Israel Deaconess Medical Center & Harvard Medical School**
Assistant Researcher, Department of Neurology, under Dr. M. Brandon Westover
Developed CICADAS-II, the successor to CICADAS (Causal Inference for Critical-Care Anti-Seizure Treatment with Disease Dynamics, Automated PKPD/Trial Simulation, and Survival Optimization): methodological frameworks that recover unbiased causal treatment effects from observational ICU data, with PKPD-aware modeling for diseased patients.

Paused or Discontinued Research

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. Written up as the AP Research academic paper submitted to the College Board.

2021–22 **City of Dallas**
Dallas City Council Research Intern, District 11 (high-school internship program through Judge Barefoot Sanders Law Magnet)
Researched smart-city development initiatives under the supervision of the city manager and the District 11 council member

ADDITIONAL EDUCATION

2026 **Massachusetts Institute of Technology**
Coursework in Bioengineering (Audit)
20.205[J]/9.26: Principles and Applications of Genetic Engineering for Biotechnology and Neuroscience

2025–26 **Harvard University**
Coursework in Mathematics and History (Audit)
Studies in Algebra and Group Theory (Math 55a); Studies in Real and Complex Analysis (Math 55b); Critical Theory (History 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

SHARED COURSE NOTES

Personal notes on courses taken, audited, or followed out of interest, shared openly at samuel-stephens.com/notes. Mostly transcriptions and summaries of other people's lectures and texts; course numbering inspired by MIT.

2025–26 *Math 55a: Studies in Algebra and Group Theory*: the textbook listed under Books, with transcriptions of Professor Denis Auroux's lecture notes and review sheets (full-text PDF also in the `uni` repository)

2026 *Math 55b: Studies in Real and Complex Analysis*: transcribed lecture notes

2026 *Critical Theory*: 25 lecture write-ups on the Frankfurt School (Lukács, Horkheimer, Benjamin, Adorno, Marcuse, Habermas, and beyond)

2026 *Basic Neuroscience and Geometry of Neuroscience*: neurons and signalling, behavior, the senses, methods and disorders; and Matilde Marcolli's Caltech course on dynamical, topological, geometric and categorical models of the brain, vision and language

2026 *Genetic Engineering*: notes from MIT 20.205[J]/9.26 (genome editing, CRISPR, and their neuroscience applications)

ongoing *Measure Theory*: measure and integration following Folland's *Real Analysis*

ongoing *Integrated Mathematics*: an open curriculum from arithmetic through Integrated Maths I and II (sets and proof, equations and functions, quadratics, polynomials, sequences and induction, trigonometry, polar coordinates and complex numbers, the real numbers, integral domains)

ongoing *Category Theory* and *Biology* (molecular biology, cell biology, genetics, biochemistry)

RESEARCH AREAS AND INTERESTS

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

Mathematical modeling of cognition and the mind; mathematical and theoretical neuroscience

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

MANUSCRIPTS, PUBLICATIONS, AND OTHER WRITINGS

Books and Textbooks

2025–26 Samuel D. V. Stephens. *Studies in Algebra and Group Theory*. A 519-page textbook written alongside Harvard's Math 55a (fall 2025); revised edition, November 2026. Professor Joe Harris agreed to offer it as supplementary material to the Math 55a students he teaches in 2026–27. Online at samuel-stephens.com/notes/math-55a.

Manuscripts Under Review

2026 Samuel D. V. Stephens[*], Tara Westover[*], Sahar F. Zafar, M. Brandon Westover. "CICADAS-II: Simulation-Based Causal Inference and Adaptive Dosing from Sparse Seizure Counts and Bolus Anti-Seizure Medication in the ICU." Under major revision at the *Journal of Neural Engineering*. [*]Co-first authors.

Manuscripts in Preparation

2026– Samuel D. V. Stephens. *Studies in Real and Complex Analysis*. Companion textbook for Harvard's Math 55b (spring 2026).

2026– Samuel D. V. Stephens. "Monotone Arithmetic Progressions in the Gray Code and in Negabinary Enumerations of the Integers." On Erdős Problems #195 and #196.

2026– Samuel D. V. Stephens. "On Justice: A Manifesto." On analytic philosophy's failure to provide substance for societal and structural just formation.

2024– Samuel D. V. Stephens, John Cervantes. "Collaborative Manuscript in Political Philosophy." A long-term two-person collaboration on the intersections of political theory, educational theory, and ethics, with an extensive chapter outline and drafted sections.

Musical Arrangements

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

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—recording and sheet music available openly online

Essays

Essays and commentary on philosophy, politics, and mathematics at samuel-stephens.com/blog.

TECHNICAL PROJECTS

Research and Academic Software

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

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

2023– **uni** — Command-line tool for managing coursework, lecture notes, and problem sets in LaTeX and Org-mode. Sole developer; built for personal use and released openly for others. 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 `pdflatex` 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

Personal Projects

2026– **graphite** — Graphing and 3D calculator for the reMarkable Paper Pro. Sole developer. *Repository currently private; in active development.*

Renders 2D, parametric, polar, and implicit curves and shaded 3D surfaces, and is designed to insert graphs into the active notebook or document as native, resizable objects

QML (Qt Quick Canvas) frontend for the interface and rendering; Python backend (`sympy`/`numpy`/`scipy`) over a Unix socket for parsing, symbolic computation, sampling, and 3D meshes; delivered to the device through XOVI/AppLoad

2024– **Better Campus** (formerly 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

2025–26 **rmpp-stabilizer** and **rmpp-wikipedia** — Tools for the reMarkable Paper Pro. Sole developer. *Discontinued.*

`rmpp-stabilizer`: an `LD_PRELOAD` shared library (C++, MIT licensed) that intercepts evdev pen input before `xochitl` and smooths handwriting in real time, with moving-average, Gaussian-weighted, Krita-style *string pull*, and One Euro (Casiez et al., 2012) filters; Docker-based aarch64 toolchain

`rmpp-wikipedia`: an offline Wikipedia reader, a Qt/QML interface talking over loopback HTTP to a native `zimserver` backend built on Kiwix `kiwix-tools` and `libzim`

AWARDS AND HONORS

2025 Honors and Dean's Scholar, Wabash College

2023 KEEP-STEM Scholar, Kenyon College (program supported by the National Science Foundation)

2022 AP Capstone Scholar, The College Board

2021 AP Scholar with Distinction and Honors, The College Board

TEACHING

Tutoring

2025– *Private Mathematics Tutor*
Tutors a Boston exam-school student in precalculus, AP Calculus BC, and physics; writes student guides, worked solutions, and inquiry-based homework.

2023 *Online Lecturer*, children's mathematics lecture series
Created a YouTube lecture series (@Vichaama) with custom curricula and materials.

Independent Curriculum

Open mathematics curriculum for self-paced learners, starting from arithmetic. It takes a structural approach to mathematics, shaped by the shortcomings of the 1960s *New Math*, and a Humboldtian, dialectical view of education. Worksheets, problem sets, and lecture notes are published at samuel-stephens.com/notes/integrated-maths; lectures are scripted in LaTeX and will be recorded for YouTube (@Vichaama).

Basic Mathematics (in progress)—pre-algebra, arithmetic as structure, algebraic foundations, number theory, geometric reasoning, counting and probability, and functions, laid out lecture by lecture

Integrated Mathematics I (notes online)—sets and proof; equations, functions, and graphs; quadratics; polynomials; sequences, series, and induction; with graph theory, combinatorics, and probability planned

Integrated Mathematics II (notes online)—trigonometry; parametric equations, polar coordinates, and complex numbers; the real numbers; groups, rings, and fields; with vector spaces and topology planned

Integrated Mathematics III and IV (planned)—advanced linear algebra, advanced group theory, real analysis, and topology; then complex analysis, differential equations, Lie groups, geometry, and differential geometry

PROFESSIONAL EMPLOYMENT

2025– Self-employed, Massachusetts
Private Mathematics Tutor

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

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