Chad Chapnick
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Education

May 2018 **B.Sc. Electrical Engineering - Bioelectronics**, *Saint Louis University*

Minors Biomedical Engineering, Computer Science

GPA 3.91/4.00

Experience

2023-Present **Senior Full Stack Software Engineer**, *Unchained Capital*

- Spearheaded crypto and banking system architecture, migrating thousands of IRA accounts with zero downtime.
- Built Loan CTP Ratio system mapping per-loan ratios to contractual obligations with client-signed compliance documents.
- Migrated legacy wallets to SegWit, improving transaction privacy and fee efficiency.
- Designed Flexible Quorums (protocol-level multisig), extending Bitcoin protocol capabilities beyond 2-of-3 models.
- Developed UTXO Risk Scoring system filtering OFAC-associated coins and refactored coin selection algorithms for compliance.
- Contributed to Caravan: waste auditing and wallet fingerprinting with Shannon entropy.
- Engineered GPG Bridge with YubiKey integration and QR streaming; refactored ISO builds with UTM/QEMU; built Akou microservice for websocket updates.
- Built Suede microservice for document templating (Helm/Kubernetes); refactored braid factories for scalable xpub derivation; provided architectural guidance on APIs and subsystems.
- Led Concierge Onboarding, mentoring clients across technical skill levels to increase adoption.
- Mitigated front-end source map exposure; standardized hardware wallet emulation; authored internal debugging documentation and multi-debugger workflows.
- Stripe billing

2018-2023 **Software Engineer**, *Cadre Forensics*, Chicago, IL

- Constructed core interfaces between 3D scanning hardware and AWS GovCloud, revolutionizing exchange of firearm topography data worldwide.
- Implemented robust REST APIs on microservice architecture with Python/Flask to facilitate communication across a suite of forensic applications.
- Containerized proprietary AI/ML comparison algorithms, transitioning from Windows to Enterprise Linux, enabling the use of cloud compute resources at scale.
- Core contributor to flagship products demonstrating proficiency in multithreading, state management, caching, optimization, and cryptography.
- Engineered a C++ library that applies advanced techniques such as templating and object-oriented design for superior backend system integration.
- Exhibited expertise in SQL database design, efficient queries, and object-relational mappers to ensure optimal performance, data integrity, and abstraction.
- Developed a system to disseminate, score, and analyze the performance of firearm examiners employing Virtual Comparison Microscopy.
  Deployed front-end apps in JavaScript/React to share results with participants.
- Leveraged industry-leading automation frameworks, including Docker, Jenkins, Terraform, and Git, for continuous integration, cross-platform testing, and seamless deployment.
- Collaborated with federal agencies to craft a novel inventory management system and streamline evidence intake.

2017-2018 **Software Engineer Intern**, *Cadre Forensics*

- Delivered a proof-of-concept solution that simplifies chain of custody between firearm examiners by sharing virtual rather than physical samples.
- Built core software components in Python/C++ to demonstrate data sharing and security.
- Implemented cryptographic standards such as the Secure Remote Password protocol and PBKDF2-HMAC-SHA256.
- Developed a Python package to manipulate data in the X3P (XML 3D Surface Profile) format.
- Demonstrated exceptional performance and commitment during the internship, leading to the opportunity to continue contributing to the company as a full-time team member.

2016-2017 **Undergraduate Researcher**, *Dr. Michelle Sabick's MEDIC Lab*, St. Louis, MO

- Prototyped a device to measure body temperature, acceleration, heart rate, and blood-oxygen content
- Developed an iOS client that invoked Bluetooth APIs to communicate with an ARM SoC
- Created libraries to establish communication with peripherals using I^2C

2016-2017 **Academic Tutor**, *Saint Louis University Student Success Center*

- All levels of mathematics and general physics

2015-2016 **Startup Engineer**, *MEDLaunch: Medicine, Entrepreneurship, & Design*, St. Louis, MO

- Worked with a team of students to develop a medical device prototype.
- Engaged in design reviews and market research with clinical and industry mentors.
- Showcased the prototype and a complementary business model to local investors at Demo Day.

2015-2016 **Research Assistant**, *Dr. Allison Miller's Plant Biology Lab*, St. Louis, MO

- Performed leaf shape analysis using a digital morphometrics approach.
- Leveraged the statistical computing power of the R programming language to analyze biological data sets.
- Explored RAD-Seq phylogenetics

2014-2016 **Preparatory Teaching Assistant - Upper Division Labs**, *Saint Louis University Dept. of Biology*

- Employed meticulous inventory management, to maintain availability of necessary supplies for lab sessions.
- Applied precise techniques such as aliquoting, to ensure accurate distribution of samples and reagents.
- Fostered collaboration with faculty and fellow teaching assistants to adhere to specific experiment requirements.

Projects

2016-2018 **High-Performance Computing Resources**
Working with individuals at SLU's Advanced Technology Group to make high-performance computing resources more accessible to students and researches.

Spring 2016 **Life Expectancy Analysis**
Conducted an analysis of major social, economic and environmental variables which predict life expectancy at birth, using multiple regression in R.

Skills

Libraries OpenCV, OpenSSL, OpenGL, Qt, Boost.Python, aws-sdk-cpp Boto3, Flask, SQLAlchemy, Pandas, NumPy, Scikit-learn, Requests, TensorFlow, React.js

Technologies Stripe, Python, C++, JavaScript, TypeScript, Kubernetes, AWS, WASM, Docker, Terraform, Jenkins, Microservices, Data Extraction/ETL, Test-Driven Development, Automated Testing, Continuous Integration and Continuous Delivery (CI/CD), Git, CMake, Visual Studio/VS Code, Vim, UNIX/Linux, Computer Vision, Control Systems, Structured Query Language (SQLite & MySQL), Shell Scripting, macOS, Windows, Excel, Jupyter Notebook, Arduino, ARM, Raspberry Pi, HTTP, SSL/TLS, REST APIs, I²C, Alexa Skills, Agile Development, 3D Printing, Statistical Data Analysis, LaTeX, Typst, bitcoin, Rust, Helm, QEMU, WebSockets, GPG, CI/CD, BC-UR

Honors

Dean's List 7 of 8 Semesters (Fall 2014—Spring 2018)

Coursework

Computer Science Data Structures, Object Oriented Programming, Microprocessors, Probability and Statistics, Discrete Mathematics, Differential Equations, Machine Learning

Electrical Engineering Linear Systems, Semiconductors, Digital Design, Electronic Circuit Design, Electricity & Magnetism, Electromagnetic Fields, Automatic Control Systems, Quantitative Physiology, Brain Computer Interface

Publications

Conferences "Expanding the Scope and Efficiency of 3D Surface Topography Analysis in Firearm Forensics" Lilien, Chapnick, Duez, Meschke, Weller, Carr, *2022 National Institute of Justice Forensic Science Research and Development Symposium* doi: 10.3768/rtipress.2022.cp.0015.2204

Journals "Results of the 3D Virtual Comparison Microscopy Error Rate (VCMER) Study for Firearm Forensics." C. Chapnick, T. Weller, P. Duez, E. Meschke, J. Marshall, R. Lilien, *Journal of Forensic Sciences*, 66(2):557-570 doi: 10.1111/1556-4029.14602 (2021).

"Digital Morphometrics of Two North American Grapevines (Vitis: Vitaceae) Quantifies Leaf Variation between Species, within Species, and among Individuals." Klein LL, Caito M, Chapnick C, Kitchen C, O'Hanlon R, Chitwood DH and Miller AJ *Front. Plant Sci.* 8:373. doi: 10.3389/fpls.2017.00373 (2017).

Patents "Automatic Supplemental Oxygen Control System With Weaning Capabilities." Issued Oct 24, 2019, U.S. Patent 16/392,272 Available: US20190321574A1