Chad Chapnick

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Education

May 2018	**BS, Electrical Engineering, Emphasis in Bioelectronics**, *Saint Louis University*, St. Louis, MO.
Minors	Biomedical Engineering, Computer Science
GPA	3.91/4.00

Experience

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*, Chicago, IL.
- 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 processor
- Created libraries to establish communication with peripherals using I^2C

2016–2017 — **Academic Tutor**, *SLU Student Success Center*, St. Louis, MO.
- Tutored students in 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 with clinical and industry mentor.
- 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.

2014–2016 — **Preparatory Teaching Assistant - Upper Division Labs**, *SLU Dept. of Biology*, St. Louis, MO.
- 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   **Improvement of 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.

May 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.

Technical Experience

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

Technologies   Python, C++, JavaScript, AWS, Docker, Terraform, Jenkins, Microservices, Test-Driven Development, Git, CMake, Vim, UNIX/Linux, Visual Studio/VS Code, Continuous Integration and Continuous Delivery (CI/CD), Computer Vision, Control Systems, Structured Query Language (SQLite & MySQL), Shell Scripting, Jupyter Notebook, Arduino, ARM, Raspberry Pi, HTTP, SSL/TLS, REST APIs, I^2C, 3D Printing, Statistical Data Analysis, LaTeX

Honors

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

Relevant 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

Scientific Publications

"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 (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, us 16/392,272