Nathaniel Buechler

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Cross-disciplinary software application engineering expert and leader with extensive end-to-end experience engineering logistics, cybersecurity, and data analysis platforms for enterprise and government customers. Specialized in JavaScript and Python, leveraging modern frameworks (React, Angular, Flask) to masterfully design, craft, and maintain user-friendly interfaces within complex adaptive systems and software architectures.

Security Clearance: Top Secret (TS)

Languages: JavaScript (ES6+), TypeScript, HTML5, CSS3, Python, Java, SQL, Bash Front-end: React, Angular, Redux, RxJS, D3, Web Components, jQuery, jQuery UI, AJAX

Back-end: Node, Express, Flask, Django, J2EE, Grails, REST APIs

Cloud & DevOps: AWS (EC2, RDS, S3, Route 53, IAM, CodeDeploy, etc.), Kubernetes, CI/CD Pipelines, Git, GitHub

Databases: MongoDB, PostgreSQL, MySQL, Elasticsearch, Neo4j, and other SQL and NoSQL Databases

AI & Data Science: LLMs, Hugging Face, SpaCy, NLTK, Pandas, NumPy, SciPy, SciKit-Learn, Matplotlib, Jupyter

Geospatial & Mapping: Mapbox, Leaflet, Geospatial Data Processing, GIS Systems, C2, ISR

Testing & Build Tools: Jasmine, Mocha, Jest, Karma, NPM, Webpack, Babel

Additional Systems Engineering: Signal Processing, Application Development, Microservices Architecture, Agile, Scrum, Kanban, SaaS, HTTP, REST, UX Design, Leadership and Management (Project, Program, Technology)

Experience:

<u>Principal Software Engineer</u>, Alpha Nexus Technologies, December 2017 – Present <u>End-client: Various Enterprise and Government Entities</u>

- Established complex adaptive systems and advanced architectures to fortify commanders, planners, and other strategic decision-makers in their high-stakes critical missions, emboldening them with a unified ISR command platform integrating multi-domain sensor data and dynamic re-tasking, while empowering operators with fused operational awareness and live targeting control surfaces, designed to dominate the information operations environment
- Engineered a modular content management and digital interaction platform using React, Flask, Postgres, and AWS
 (EC2, RDS, S3, Route 53), featuring event calendars, discussion forums, enterprise resource planning (ERP) and
 other management tools, while leveraging generative AI and LLMs to enhance automation and user experience
- Developed robust and secure user management within a microservice architecture, employing Cookie/JWT authentication strategies, and integrating role-based access (RBA), CRUD operations, and comprehensive error handling, thus enhancing overall user experience and system security
- Utilized **empathy maps**, **user personas**, **journey maps**, and **user stories** to craft intuitive and modern enterprise and government software applications, with a strong focus on inclusivity and cultural synchronization
- Applied data science techniques, using Scrapy for web processing, NLTK for parsing, Pandas for handling analysis
 pipelines, and Matplotlib for graphing results, to enrich analytical capabilities
- Mentored six junior developers through the 'Nova Program', which is an apprenticeship-style pathway within Alpha Nexus Technologies, guiding them from foundational skills in React, Flask, and PostgreSQL to integrated full-stack development with LLM-augmented microapp deployment, with each participant achieving within a year the ability to independently architect, build, and iterate while leveraging production-grade and industry standard tools

<u>Associate and Senior Full Stack Engineer</u>, The Boulevard Consulting Group, February 2023 – April 2023 End-client: Georg Fischer Central Plastics (Et al.)

- Generated photorealistic 3D factory-floor models using Gaussian splatting and integrated them into Simio for digital twin ('Industry 4.0') layout simulation, supported by Sankey diagrams to guide spatial arrangement of 100+ process entities across dozens of steps and three primary candidate designs for Georg Fischer's Shawnee, Oklahoma gas meter fabrication department, enabling scale-up from single-digit to tens of millions in annual production revenue
- Simulated optimal throughput with **Simio** of metal processing assembly lines to enhance the production of risers, transitions, and meters sets with an **L2 metric-based approach** which in turn dramatically reduced the distance of 100+ process entities and also thereby the entire cost of operation
- Statistically represented several assembly line models with Monte Carlo experiments in Simio to assess future
 assembly layouts and to suggest the strategy and function of reducing cost per utilization of physical space by
 multiple orders of magnitude when compared with the existing legacy layout
- Adapted new and existing Django, Flask, and React applications to support data aggregation, decision analysis systems, and other data processing use cases with unit tested D3 data visualization, Python, and JavaScript

Senior Software Engineer, Radyant, September 2021 - December 2022

End-client: The Defense Logistics Agency

- Operationalized full-spectrum readiness visualizations for the Defense Logistics Agency through highly configurable Angular dashboards featuring 'green-yellow-red' roll-ups, enabling real-time strategic decision-making across all US military branches and 100+ global operational sites, with visibility into enterprise-scale logistics, materiel flow, and mission-critical operations CONUS and OCONUS
- Modernized federal government legacy enterprise components to **Angular 10** within an **'angular-gridster'** intelligence dashboard in order to display dynamic **geospatial maps**, '**ngx-charts'**, and **D3** data visualizations
- Encapsulated highly-scalable and reusable **Angular** components via 'state-of-the-art' **RxJS** patterns for interactive and complex **executive data analysis** which enabled DLA executive users to gain insights about global ontologies, logistics, supply chains, and other workflows of their entire federal government enterprise
- Connected with various teams ranging from 5 to 20 members while practicing the SAFe 5 Scaled Agile framework
 to provide simple and efficient user-centered analytics for federal government missions within the DLA

<u>Senior Software Systems Engineer</u>, Rivera Group, February 2020 – January 2021 End-client: The Johns Hopkins University Applied Physics Laboratory

- Orchestrated the initial proof-of-concept and engineered critical modular web components, modernized from legacy JSP/AngularJS to Angular 9, within the OpenDash web environment, directly enabling the Persistent Cyber Training Environment (PCTE) and any subsequent Joint Cyber Forces cyber range to demonstrate cross-organizational interoperability with JHU APL's components, proving that any USCYBERCOM-aligned entity could deploy modular capabilities from any location within a secure SSO environment
- Upgraded and transformed tightly-coupled legacy JSP/AngularJS views into its modern Angular 9 equivalent as part of a major transition to a service-oriented architecture supporting the PCTE and the Joint Cyberspace Operations Forces
- Spearheaded user interface **modernization** efforts for JHU APL's 'green-yellow-red' scorecard-based training and tracking system, enhancing adaptability across PCTE and other web-based platforms, while crafting intuitive interfaces using **Material Design** best practices and dynamic data visualizations with **D3** (version 5)
- Improved code reusability with Web Components and the Shadow DOM though the implementation of the 'ViewEncapsulation' standard in the Angular ecosystem while handling shared state between components with RxJS Observables specifically with a focus on leveraging the 'BehaviorSubject' module

Senior Full Stack Developer, TISTA Science & Technology Corporation, September 2019 - November 2019

- Engineered 'green-field' software applications and communicated advanced software architecture patterns while documenting state-of-the-art concepts
- Led the development efforts on several concurrent application development initiatives and collaborated within small agile teams

Ul Developer, Insight Global, January 2019 – June 2019

End-client: Bank of America

- Developed Angular 6 form-based user interfaces for configuring networks
- Cooperated on an international team working across multiple time zones, from London, UK to Texas, USA and participated in regular SCRUM ceremonies taking place as 3 week cycles

Research Engineer, Two Six Labs, March 2017 - December 2017

End-client: The US Air Force Research Laboratory

- Visualized cyber capability discovery to empower cyber analysts to derive actionable insight from complex system
 and network behavior while surfacing static analysis, dynamic instrumentation, fuzzing workflows, and other
 vulnerability detection methods within a simulated LLVM environment, further translating runtime activity across
 virtualized multi-terabyte RAM systems to support coherent operational views for US Air Force Research Laboratory
 advancement of DARPA-inspired cyber warfare tooling
- Realigned user interfaces with modern design implementations, separated monolithic code into separate and modular services, and reorganized research project development efforts into production-ready software
- Engineered multiple features to **cyber capability exploration** including **sequence matching algorithms** in Python, Angular file system user interfaces for firmware, and **system diagnostic tools** across the application stack
- Implemented user-centric interfaces for static and dynamic analysis, fuzzing, and other cyber capabilities for government systems, whereby asynchronous Tornado REST APIs interfaced with LLVM instances running in a Kubernetes-based dockerized environment
- Researched **IETF RFC specifications** for information about Internet protocols, guided a small team of interns, and leveraged **Docker**, machine learning, and programming language theory

Senior UX Engineer, Novetta, October 2016 – March 2017

End-client: The US Air Force Office of Special Investigations (Et al.)

- Supported AFOSI operators in integrating digital network forensics such as PCAP into viable investigative case
 workflows through Novetta Cyber Analytics (NCA) capabilities, with a resulting 15-page UX report driving iterative
 improvements, informing future business development use cases, and reducing workload requirements
- Enhanced the user experience engineering of Novetta's advanced analytics in the domains of cyber, mission, and entity-centric data with advanced user interfaces, prototypes, and complex data visualizations
- Conducted user interviews with AFOSI leaders and generated a 15-page user experience report emphasizing the major areas of improvement for NCA

UI Software Developer, Novetta, July 2015 - October 2016

End-client: The US Air Force Office of Special Investigations (Et al.)

- Established modern UI architecture for NCA, introducing React, ES6, and service-based JavaScript components to replace brittle jQuery-based code, creating a foundation that could be extended to clients across defense, law enforcement, and energy sectors
- Led user interface maintenance and improvement efforts related to NCA which include enhanced user experiences and the addition of modern tech like **React**, **Babel**, and **ES6**
- Extended core system functionality with **JavaScript microservices** in order to enhance **cyber forensic analysis**, **PCAP readability**, and **mission capabilities** of AFOSI and other customers.

JavaScript UI Engineer, DrFirst, January 2015 - July 2015

- Steered the development of several modern (Web 2.0) and responsive **Angular applications** while detecting mobile (iOS and Android, specifically) clients by implementing **Yeoman**, **Ionic**, **NPM**, **Bower**, and other technologies
- Performed routine maintenance and enhancements of the administrative application (**Ember**) which includes improvements to the UI/UX of **secure HIPAA compliant messaging**, auditing, and archiving

Java Developer, InfoZen, April 2014 – October 2014

- Expanded data visualizations to fulfill Fair Credit Reporting Act (FCRA) compliance requirements for software systems while rendering an enhanced score-based metric to rank individual fitness on continuous evaluation schedules for civilian labor across industry sectors during hiring, retention, and early risk detection programs
- Generated complex data visualizations with front-end JavaScript technologies such as D3, jQuery, jQuery UI, and Angular
- Conceived dynamic dashboards, responsive design patterns, aesthetically pleasing layouts, clear user interfaces, and friendly user experiences which display insightful business analysis and reporting from the usage of Java, MongoDB, Groovy, Grails, Hibernate, HTML5, CSS3, Bootstrap, and JavaScript

<u>Senior UI/UX Developer</u>, Artech Government Services, August 2013 – April 2014 *End-client: InfoZen*

- Visualized advanced user interfaces with D3 to create Sunburst, Chord, and other layouts to augment human adjudication of potential risk in individuals modeled on the suitability criteria of the SF-86 form to distinguish bad actors from large populations in high security environments
- Implemented agile techniques on 7-person team practicing SCRUM with test-driven software development (TDD)
- Leveraged modular user interfaces comprised of Java, Groovy, Grails, JavaScript, HTML, and CSS

Asymmetric Systems Engineering:

Supported the architecture, deployment, and operationalization of multiple advanced platforms designed for strategic visibility, symbolic engagement, and complex adaptability. Systems included real-time orchestration interfaces, cultural diagnostic environments, simulation and forecasting frameworks, and constellation-based onboarding and coordination layers. These platforms remain under selective disclosure.

Operating at the intersection of modular intelligence, human insight, and mission-critical infrastructure. Deploying composable systems that shape decision, perception, and tempo across domains.