James Nicholson

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Recent Activity

Winner of the PyTorch Edge AI Hackathon in October 2025

Experience

Senior Web and Application Developer, Harvard Chan School of Public Health Sept 2019 – present

- Designed and implemented an authentication/authorization layer for Harvard's intranet, integrating with the University's SAML2 identity provider to provide fine-grained access controls and improve operational stability.
- Served as technical lead on a multi-year flagship website redesign, collaborating cross-functionally with product stakeholders across multiple organizations and ensuring scalable, distributed backend systems.
- Completed a Master's Degree in Software Engineering from Harvard while working full time, reinforcing expertise in system design, distributed systems, and backend engineering.
- Developed an application to programmatically generate and update thousands of faculty and researcher profiles using PHP, JavaScript, and MySQL, improving data consistency and reducing operational costs by ~$20k annually.
- Onboarded and mentored new developers while establishing long-term sustainability through architecture design, documentation, and code quality improvements, enhancing team scalability.
- Led technical implementation of the Emma email marketing service (SSO, DKIM, contact sync), strengthening scalability, observability, and accessibility of school-wide communications.
- Engineered background processes for automated user deprovisioning, content archiving, and restore-from-backup capability, reducing database load and mitigating operational risk.
- Implemented automated synchronization across environments to ensure production parity, reducing developer friction and improving feature delivery speed.
- Introduced an asynchronous job queue, centralized logging, and pull request templates, enhancing monitoring, reliability, and developer workflows aligned with best practices for distributed systems.

IT Systems Analyst, Stanford Graduate School of Business Sept 2015 – Sept 2019

- Developed and maintained a service request platform with multiple backend iterations, automating scheduling, metadata tracking, and integration with class capture systems, saving hundreds of hours annually and improving scalability.
- Designed and deployed a cost-efficient SMS alert microservice, reducing spend from ~$600/year to <$50/year, demonstrating ownership of end-to-end project execution.
- Built automation and scripting tools (NetDB cleanup, Crestron Toolbox integrations, Google Apps Script pipelines) that streamlined workflows, reduced manual tasks, and improved system reliability.
- Completed Crestron certifications (Digital Media 4K Engineer, Programming 101, Smart Graphics) enabling advanced backend integrations with AV and distributed systems.
- Partnered with hardware vendors to integrate cloud-based class capture systems, supporting automated scheduling, real-time monitoring, and distributed cloud migration.
- Created Tableau dashboards from service platform data, enabling management to track costs and improve decision-making through data visualization.
- Led peer cross-training sessions to reduce single points of failure and increase team resiliency.
- Earned commendations from faculty and staff for professionalism and execution on critical backend systems and events.
- Supported high-visibility events including MBA Admissions webinars (400+ registrants) and global distance learning programs, ensuring seamless delivery with reliable backend infrastructure.

Education

University of Colorado Boulder, BS in Journalism

Harvard Extension School, MS in Software Engineering

- Thesis: Automated information extraction using a large language model, building a distributed multi-threaded pipeline with Python and Meta's Llama API, accelerating extraction by 20x in collaboration with Pfizer scientists.
- Completed advanced coursework in Cryptography, Cloud Services, Operating Systems, Artificial Intelligence, Scala for Big Data, Mathematical Statistics, and Robotics.

Projects

Predicting Flight Delays

- Built a random forest model in Python with scikit-learn and pandas to predict delays using temporal and operational features.
- https://nicholsonjf.com/flight-delay-prediction/

Multi-Class Image Classification: Transfer Learning vs. Standalone CNNs

- Compared transfer learning against standalone CNNs for multi-class classification; implemented with Python, Keras, and pandas.
- https://nicholsonjf.com/transfer-learning/

Information Extraction via Large Language Model (HECTRE)

- Developed a web and CLI application leveraging LLMs and parallel processing to extract structured clinical trial data from PDFs, reducing manual processing from months to minutes.
- https://nicholsonjf.com/hectre/

Using Akka Streams to Process MBTA Predictions

- Built a Scala/Akka Streams pipeline consuming real-time MBTA arrival data, throttling and persisting predictions for streaming analytics and distributed systems.
- https://nicholsonjf.com/mbta-arrivals/

Implementation and Comparison of Navigation Algorithms

- Implemented and benchmarked multiple path-finding algorithms for robotics/AV contexts, analyzing performance tradeoffs in distributed computing environments.
- https://nicholsonjf.com/navigation-algorithms/

Academic Profiles (Automated Faculty Profiles)

- Engineered automated generation of thousands of faculty/researcher profiles with PHP, JavaScript, and MySQL, replacing manual entry and saving ~$20k annually.
- https://nicholsonjf.com/academic-profiles/

Skills

Languages & Frameworks: Python, JavaScript, Php, MySQL, Scala, C

Data & Infrastructure: Postgres, BigQuery, Redis, Akka, ElasticSearch, Docker

Systems & Architecture: System design, Distributed systems, Backend APIs, Cloud computing (AWS), API integration, Observability, Scalability

Other: Project management, Cross-functional collaboration, Accessibility & privacy compliance, Data visualization (Tableau, Seaborn), QA process implementation