NATHAN KARASCH

APPLICATION DEVELOPER

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PROFILE

Nathan is a well-rounded Application Developer with expertise in designing, developing, and testing software solutions to meet strategic business goals. His affinity for learning and mastering new technologies allows him to bring valuable insights to conceptual planning and discussions, enabling the team to choose the right tools needed to deliver high quality results. His effective written and verbal communication skills help keep development efforts aligned with customer expectations, ensuring the right solution is delivered the first time and reducing wasteful rework. As a consultant, he excels at identifying pain points in development processes and presenting thoughtful solutions to maximize efficiency and increase return on investment. His recent work focus has been in the application of data science and machine learning techniques to build intelligent systems.

EXPERTISE

- Identifying technical solutions to meet strategic business goals
- Communicating effectively and proactively to facilitate synergy and transparency
- Designing and implementing web-based applications, including user interface, REST API, ER database model, microservice architecture, third-party integrations, and security
- Delivering value in all software development phases, including requirements gathering, architecture, design, development, integration, testing, and deployment
- Researching and identifying the best technologies for use within a given project
- Effectively presenting technical topics to both technical and non-technical audiences
- Innovating internal tools to streamline development and increase productivity
- Aligning product development to business goals, technical requirements, and user satisfaction
- Training, evaluating, and deploying machine learning models to provide targeted insights
- Selecting and integrating various cloud services to create scalable project infrastructures

TECHNOLOGIES

- Java
- MySQL / Oracle / SQL Server
- REST / SOAP / RPC
- JavaScript / Node.js
- Google Dart / TypeScript
- Google Cloud Platform
- H2O Driverless AI
- Java Spring
- HTML / CSS / SCSS
- Linux / Bash / Git
- Angular / React
- Docker / Travis CI
- Amazon Web Services
- Scikit-learn / XGBoost
- Java concurrency
- ANTLR / Protocol Buffers
- Perl / Python / R
- C / C++
- Adobe Creative Cloud
- Microsoft Azure
- Oracle APEX

CERTIFICATIONS

- Machine Learning (Stanford Online | Coursera, 2019)
- Intro to Machine Learning (Udacity, 2018)
- Content Marketing ROI (Lynda.com, 2018)
- GCP Essentials (Qwiklabs, 2018)
- Google 360 Suite Overview (Lynda.com, 2018)
- Microsoft Office Specialist - Word 2010, Excel 2010 (Microsoft, 2013)

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EDUCATION

Iowa State University
Ames, IA
Bachelor of Science: Software Engineering
Summa Cum Laude

EXPERIENCE AT ZIROUS

Application Developer | Biofuel Company | Lab Requests Application
This company's lab processes biofuel samples submitted by their facilities across the US, and for years they had used Excel spreadsheets to track samples through the process from beginning to end. In an effort to streamline this process, the company hired Zirous to create a web application to facilitate submission, processing, administration, and analysis of lab requests. I performed most of the architecture, design, and front-end development for this project.

- Designed, documented, developed, tested, and deployed the application
- Performed requirements gathering, translating requirements and design decisions into an actionable plan by creating user stories and subtasks in Atlassian Jira
- Implemented the entire front-end (web user interface) in Angular
- Assisted with implementation aspects of the Java Spring back-end
- Coordinated meetings, sent weekly project updates, gathered and integrated client feedback, and demoed project milestones

Application Developer | Government Agency | Electronic Document Filing Application
Zirous developed an application years ago to facilitate the client being able to receive, distribute, and publish documents from their customers. I maintained this system and provided support for ad-hoc requests, troubleshooting, and development.

- Developed SQL queries to generate custom reports.
- Provided timely responses and solutions to ad-hoc requests, communicating effectively to gather requirements and deliver on-target solutions.
- Implemented monitoring processes to ensure successful delivery of critical email notifications.

Application Developer | Food Production and Distribution Company | Machine Learning POC
The client used Oracle E-Business Suite to manage its various manufacturing processes. It struggled with intermittent "hanging process" issues within the system, which led to wasted time and resources. The notification system that raised alerts for hanging processes was inefficient, missing many cases and having a high rate of false alarms. This proof-of-concept project demonstrated the ability of statistical analysis and machine learning to more accurately identify hanging processes and reduce the rate of false alarms.

- Configured the database connection, allowing data to be pulled from an Oracle database into a Python notebook.
- Created an effective machine learning model to predict whether or not a concurrent program would hang. This involved data discovery, data cleaning, feature engineering, model selection, hyperparameter tuning, model training, and evaluation. The final model caught more than 4x as many hanging processes as the existing system, while decreasing false alerts by 70%.

Application Developer | Workers Compensation Insurance Company | H2O Driverless AI POC
This client was exploring various machine learning frameworks to expand their data analytics capabilities. As part of this effort, they hired Zirous to test-drive and report on the capabilities of the enterprise-level AI platform, H2O Driverless AI.

- Provisioned, configured, integrated, and secured all Google Cloud Platform (GCP) resources used in the project, to include Compute instances, marketplace deployments, Identity and Access Management (IAM), networking and firewall rules, Cloud Storage, BigQuery, and Datalab.
- Created an end-to-end machine learning pipeline, which was able to import the data, perform extract-transform-load (ETL) to clean and shape the data, train a machine learning model, evaluate the training results, save and version model artifacts, and deploy the model to a load-balanced CPU cluster in the cloud as an HTTP endpoint.
- Co-authored the final 62-page report documenting data analysis, product insights, platform usage instructions, model operationalization processes, and cloud configuration details.

EXPERIENCE PRIOR TO ZIROUS

Research Assistant | Iowa State University | Department of World Languages & Cultures
Two clients required unique, scalable solutions for aggregating and managing their research data. One solution moved the client's existing spreadsheet data management process into a relational database with a web interface. The other solution played audio samples for the research participants, collected survey responses, stored the survey data alongside correlated demographic information, and provided an administrative interface to upload audio or download survey results.

- Leveraged ISU's Drupal website infrastructure to provide an interface for data management
- Designed the database schema for both projects, creating custom rules to join tabular data along common keys to reduce duplication and increase data cohesiveness
- Architected and implemented a custom web application to serve as an audio-rating platform
- Adapted to client requests to migrate the solution to Amazon Mechanical Turk midway through the project
- Maintained open lines of communication with the clients to solicit feedback throughout the design and development process to ensure the solution was meeting the clients' goals

College Tech Spec Intern | Leidos, Eagan, MN | Automated Flight Service Station (AFSS) Project
The teams on the AFSS project were iteratively developing and releasing the next generation of functionality for the 1800wxbrief.com web platform. Nathan worked on both the front-end (JavaScript) and back-end (Java, bash, perl) development efforts to deliver greater functionality on the Winds Aloft portion of the platform.

- Designed and implemented a dependency analysis tool that constructed a graph of script dependencies to facilitate runtime optimization
- Rewrote several existing scripts to decrease test runtime by multiple orders of magnitude (from several minutes down to a fraction of a second)
- Architected a major refactor to enable common code reuse
- Created a browser extension to facilitate more efficient development processes
- Given a classified clearance level to work on FAA projects
- Delivered status updates and live demos to 100+ stakeholders on a bi-weekly basis

Software Engineering Intern | Workiva, Ames, IA | Wdesk Spreadsheet Application
Nathan spent two summers developing the front-end (Google Dart) for the spreadsheet web application in the Wdesk platform. The first summer the product was still in research and development, and the second summer it was being used in production.

- Developed new features and fixed bugs in an agile (scrum/kanban) environment
- Headed a browser compatibility project, delivering key insights to the team for future
- development
- Wrote, tested, and reviewed code to deliver high quality results and customer satisfaction
- Designed and developed an innovative solution to bring a feature in alignment with industry standards
- Worked with the Atlassian software suite (Jira, Bamboo, etc.)