John Furlong

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https://github.com/jfur1 | https://www.linkedin.com/in/jfur1 | https://johnfurlong.io

Education

Bachelor of Computer Science **Aug 2016 - Dec 2020**

University of Colorado, Boulder *CS GPA: 3.5 / 4.0*

Skills

Programming Languages JavaScript | TypeScript | Python | SQL | MongoDB | C++ | C | Bash

Frameworks React.js | Next.js | Node.js | Express.js | FastAPI | Redux | React Native

Tools Git | Docker | Podman | Kubernetes | Azure Cloud | AWS EC2/S3/EFS

Experience

Orion Space Solutions **March 2023 - Present**

Applications Engineer III, Oct 2024 - Present *Louisville, CO*

- Take on increased responsibility in technical projects across the company's core platform, contributing full-stack to the design, development, and research of new technologies.
- Act as a bridge between engineering & research teams to translate scientific models into scalable applications. Mentor junior developers on best practices in frontend & backend development, cloud architecture, and DevOps.

Applications Engineer II, Mar 2023 - Oct 2024

- Created responsive user interfaces and data visualizations using React.js/Next.js and Redux. Developed RESTful APIs and backend services using FastAPI and Node.js to streamline data workflows and integrations.
- Designed and implemented scalable data processing pipelines using Python, handling large datasets from scientific observations and AI/ML models. Leveraged containerization tools such as Docker and Kubernetes.
- Implemented secure and scalable cloud solutions in Azure & AWS. Obtained AZ-900 Certification in Mar 2024.

Western Union **July 2021 - Oct 2022**

Software Engineer I *Denver, CO*

- Supported the migration of core services from legacy platforms to modern stacks using React.js, Redux, and Java, improving maintainability and performance.
- Refactored database queries in PostgreSQL and MongoDB to align with the updated schema of modernized components, enhancing data consistency and system efficiency.

Phia Labs **Sep 2020 - Jan 2021**

Software Engineer *Boulder, CO*

- Created and modernized features for a client's business website using React.js, PHP, and MySQL.
- Rebuilt legacy systems to add new features, including user notifications and an automated mailing system.

Notable Projects

AI as a Service, Orion Space Solutions **Apr 2024 - Ongoing**

Full Stack Developer, Team of 12

- Developed a cloud based (Azure) platform for AI/ML scientists to develop, train, and host models. Deployed using various Azure services including Azure Kubernetes Service (AKS), APIM, Azure Pipelines, and Microsoft Entra ID.
- Responsible for system architecture tasks such as VNET isolation, CI/CD pipelines, mTLS configuration, API management, and implementing user authentication with OAuth2 using Microsoft Entra ID.
- Proposed and implemented a WebSocket-based solution to replace a synchronous HTTP endpoint for a custom LLM, enabling the parallel execution of long-running tasks, reducing average total response time by over 80%.

Earth Observation Digital Twin, Orion Space Solutions **Mar 2023 - Sep 2024**

Full Stack Developer, Team of 6 *https://www.nesdis.noaa.gov/news/joint-venture-digital-twin-report*

- Developed an earth-observation digital twin for NOAA as a solution for processing & visualizing high-resolution depictions of global weather conditions using current satellite & ground observations.
- Responsible for microservices including frontend webapp (next.js), API gateway (node.js), ETL pipeline (python), processing service (python), database (PostgreSQL), and deployment (docker-compose) to Azure.
- Leveraged CesiumJS for a web-based, 4D (3D + time) environment for the volumetric rendering of time-dynamic, big-data using 3D Tiles, an Open Geospatial Consortium (OGC) spec. and orbit propagations using GLSL shaders.

Publications

Cloud-Enabled High Performance Computing Workflows in Digital Twins **Sep 2024**

J. Steward, J. Furlong, ... *https://ieeexplore.ieee.org/document/10642587*

- Proposes a novel approach of integrating cloud-based, parallelized, ensemble workflows into digital twins using high performance compute (HPC) clusters.
- Presented at the IEEE International Geoscience and Remote Sensing Symposium (IGARSS) in Athens, Greece and published on IEEE Explore.