

# Jianyu Wang

Full-stack Software Engineer & Computer Scientist

Email: swordfishwjy@gmail.com

Phone: 732-692-0731

LinkedIn & Google Scholar

## SUMMARY

- Open for Software Developer / AI Engineer / R&D positions
- 3+ years of industry experience on Agile Web Development and Github+AWS CI/CD
- 6+ years of research experience on machine learning, networking, anomaly detection, and edge/cloud computing
- 9 publications in IEEE/ACM top-tier journals and conferences + 1 US patent granted
- U.S. permanent residence (green card); No need of visa sponsorship

## SKILLS

- **Programming Languages:** Python, JavaScript, TypeScript, Java, Ruby, C#, C++, SQL
- **Development Tools:** React, Next.js, Flask, React Native, Expo, Google Guice, MySQL/MongoDB/Postgres/Supabase, GraphQL, Docker/Kubernetes, Redis
- **CI/CD:** AWS EC2/EKS/Serverless/S3, Google Cloud/BigQuery, Microsoft Azure Pipelines
- **AI & Data Science:** Langchain, Tensorflow, Keras, numpy, pandas, seaborn, scikit-learn, Jupyter
- **Expertise:** Full-stack web development, AI integration, Problem divide-and-conquer, Team communication

## WORK EXPERIENCE

**Full-Stack Software Engineer**, *IXL Learning, Raleigh/Remote, US*, 06/2023 – Present

- Actively using Next.js, React, .Net, Ruby on Rails, MySQL, Redis, Docker, Kubernetes, Jenkins, and AWS tools to build the front-back-end business logic wiring, subscription & payment, and responsive user interfaces.
- Led *RosettaStone.com* authentication system refactoring project that consolidates three silo login portals for >3 million users into a single robust one, with redesigned responsive UI and lower latency by 30%.
- Developed certificate-sharing-on-social-media functions for *Emmersion.ai* test takers and maintained AI-based language ability assessment service for individuals and companies.
- Implemented Mixpanel-based user behavior tracking, A/B testing, and API rate limiting for *ABCya.com* to better provision 300+ games for >1 million students.

**Cloud Engineer**, *Tencent America, Palo Alto, US*, 05/2021 – 08/2021

- Implemented a parallel H.265 video transcoding workflow with FFmpeg media processing library running on Tencent Cloud Compute Services (Elastic Virtual Machines).
- Developed web interfaces for media providers to visualize workflow graphs, stream video to cloud, and monitor the processing progress. JavaScript and Python libraries (e.g., jQuery, vis.js, Flask) used for UI designs and backend interaction.
- Validated workflow configurability and efficiency on VMs launching up-to 32 concurrent processes in parallel to transcode video stream, demonstrating linear decrease of total video processing time as increase of transcoders.

**Software Engineer**, *Tencent America, Palo Alto, US*, 05/2020 – 08/2020

- Implemented a prototype of Network-based Media Processing (NBMP) standard (i.e., ISO 23090-8), using Flask web framework and SQLite database, that offers RESTful APIs for users to construct cloud-based media processing workflow with customizable functions, including transcoding, subtitling, and adaptive streaming services.
- Developed JSON schemas and validation of workflow configuration files based on standard documents with python libraries, ensuring correctness of user-requested media processing configurations transferred through NBMP APIs.

## RESEARCH & DEVELOPMENT PROJECTS

**Multi-Type Water Contaminant Identification Using IoT Sensors**, 12/2022 – 10/2023

- Developed a contaminant identification system that combines Electrochemical Impedance Spectroscopy (EIS) with the Internet of Things and Machine Learning techniques.

- Achieve low cost and scalability at network edge while offering unprecedented identification sensitivity and selectivity for public health.

#### **AI-based Smart Home Devices Privacy Inference and Defense**, 08/2022 – 05/2023

- Explored vulnerabilities of IoT wireless network traffic leaking user activities and motion traces at home.
- Developed a machine learning (e.g., random forest, DBSCAN, autoencoder)-based IoT device event identification solution using encrypted wireless traffic data without access to home network.
- Performed packet padding, traffic injection, and traffic shaping techniques to reduce the feasibility of inference attacks.

#### **Verifiable Edge-aided IoT Computation Outsourcing**, 09/2021 – 07/2022

- Designed lightweight and collusion-resistant verification protocols executing on resource-constrained IoT devices.
- Proposed algorithm to masquerade verification from regular device computation requests.
- Implemented protocols on NS-3 network simulator (in C++) to validate 8x less overhead and high robustness.

#### **Intelligent Resource Allocation for Heterogeneous Edge-IoT System**, 09/2020 – 04/2021

- Modeled the patterns of computing requests from heterogeneous IoT devices with Semi-Supervised machine learning models, such as One Class-SVM and One Class Neural Network, using scikit-learn and Keras framework.
- Proposed a rational and fair resource allocation model by formulating a novel Markov Decision Process that allocates computing resources of 100 edge servers to 500 IoT devices.

#### **Context-aware IoT Device Activity Anomaly Detection**, 05/2019 – 04/2020

- Collected and analyzed network traffic data of heterogeneous IoT devices using tcpdump and WireShark tools.
- Extracted relevant features characterizing network behavior of each device using Mutual Information analysis.
- Designed a Conditional Variational Autoencoder model with Keras/Tensorflow framework to learn behavior patterns of multiple devices simultaneously and achieved 98% anomaly detection accuracy.

#### **Blockchain-based Secure Resource Management for Edge-IoT System**, 08/2017 - 06/2018

- Designed a blockchain-based registration and management system of IoT devices and tested on both Ethereum and Hyperledger platforms.
- Developed smart contracts using Solidity programming language to enforce access control rules of edge computing requests.
- Implement a web interface to register and query IoT management information using jQuery and Node.js framework.

#### **Robust Intrusion Detection Against Adversarial Learning Attacks**, 07/2018 - 04/2019

- Investigated vulnerabilities of Deep Neural Networks on adversarial attacks causing misclassification.
- Developed an ensemble defense mechanism using generative adversarial networks and adversarial learning techniques against four state-of-the-art attacks with 97% success rate.

#### **Edge-cloud Computing Testbed on University Campus**, 09/2016 - 04/2017

- Deployed an OpenStack-based edge computing platform using Dell rack servers on the campus network providing lab-use cloud-based virtual machines for instructors and students.

## **EDUCATION**

### **University of Missouri, MO**

Ph.D. (all but dissertation) & M.S. in Computer Science, September 2016 – May 2023

### **Rutgers University, NJ**

M.S. in Electrical & Computer Engineering, September 2014 – May 2016

## **AWARDS**

- Best Paper Award, IEEE International Conference on Cloud Networking, 2024
- U.S. Bank Cybersecurity Scholarship for academic year 2020-2021