Ethan Xu
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WORK EXPERIENCE

MemVerge, Inc.| Milpitas, California *May. 2024 – Present*
Software Engineer Intern

- Designed an algorithm to convert SJM job files into Nextflow scripts, facilitating seamless pipeline execution for AWS customers impacted by the discontinuation of SGE support in AWS ParallelCluster. This solution retained existing AWS customers and generated over $500K in revenue for the company.
- Designed and implemented a scalable inference solution utilizing LlamaIndex with MemVerge Memory Machine. The solution allocates additional CXL memory to the vector database process via NUMA, leveraging the low latency, high bandwidth, and extensive memory capabilities of CXL to improve LLM performance.

Northeastern University College of Engineering | Boston, MA *Jan. 2024 - April. 2024*
Graduate Teaching Assistant for Cloud Computing and Network Structures (Part-time)

- Mentored 200 students in navigating Google Cloud architecture, including VPC, Cloud SQL, and security with keyrings; emphasized hands-on experience with serverless technologies and cloud service integration.
- Led CI/CD instructional workshops utilizing GitHub Actions and HashiCorp Packer for automated builds and taught efficient cloud solution development with pub/sub models and cloud functions for scalability.

MDI Biological Laboratory| Maine, Bar Harbor *Jul. 2023 – Dec. 2023*
Software Engineer Co-op

- Collected RNA-seq data on axolotls from diverse biological experiments, serving as a vital dataset input (> 1 TB).
- Developed a transcriptome annotation pipeline included 15 nf-core modules using Python and NextFlow as well as designed an innovative subworkflow with a custom insertion, search, sort algorithm to optimize data integration.
- Deploying stateful workloads on Spot instances with Memverge to achieve up to 80% cost savings on EC2 instances.

Syracuse University College of Engineering and Computer Science | Syracuse, NY *Jan. 2021-Aug. 2022*
Graduate Research Assistant – Mentor: Distinguished Prof. Charles T. Driscoll

- Utilized R to analyze 60 years of environmental monitoring data, comprising of over 1 billion data points. Developed hundreds of R scripts and functions to clean, process and visualize the data using ggplot2 and dplyr.
- Made a presentation at the HUBBARD BROOK ECOSYSTEM STUDY ANNUAL COOPERATORS' MEETING

PROJECT EXPERIENCE

High-Performance Cloud-Native Web Application | Spring Boot, Amazon Web Service, CI/CD, DevOps

- Addressed pain points in backend application deployment, focusing on secure user data management, efficient networking, server automation, CI/CD pipelines, domain registration, and performance monitoring.
- Developed secure RESTful APIs, configured AWS CLI and networking, custom AMIs, added various resources to the Terraform template, such as S3 bucket, Lambda, CloudWatch, Route 53, Auto Scaling, Load Balancer.
- Maintained logs and metrics on AWS CloudWatch for real-time monitoring and debugging. Configured auto-scaling and load balancing features for dynamic traffic adjustments, ensuring high availability and scalability.

News Aggregator | Spring Boot, Mybatis, Redis, Web Clawer, Docker

- Developed a Web Crawler application with Spring Boot, aggregating news from various portals like CNN, New York Times, and FOX news, and crafted a responsive interface using React for device compatibility.
- Leveraged Mybatis for efficient compilation of news into a database and implemented caching with Redis, significantly enhancing the application's performance.

SKILLS

Programming Languages: Java, Python, JavaScript, TypeScript, C++, HTML, CSS, Linux, Rust, Solidity, R, SAS, Groovy
Tech Stacks & Skills: Spring Boot, Node.js, React Native, Redux, CI CD, Terraform, Packer, Docker, Kubernetes, Ansible, RESTful, MySQL, Mybastis, Redis, Hardhat, User Experience Design, Figma

EDUCATION

Northeastern University |Boston, MA *Sep. 2022 – Dec. 2024 (Expected)*
Master of Science in Computer Software Engineering
Syracuse University |Syracuse, NY *Aug. 2020 - May 2022*
Doctoral Studies in Engineering

PUBLICATION

- Tang, J.; **Xu, D. (Co-first author)**; Cai, Q.; Li, S.; Rezaeipanah, A., Towards a semi-supervised ensemble clustering framework with flexible weighting mechanism and constraints information. *Engineering Applications of Artificial Intelligence* 2024, 136, 108976. **Impactor Factor: 8**
- **Xu, D.**; Hu, S.; Zhang, D.; Xiong, Y.; Yang, Y.; Ran, Y., Importance of Sporopollenin Structure and Accessibility in the Sorption of Phenanthrene by Biota Spores and Pollens. *Environ. Sci. Technol.* 2019, 53, (24), 14285-14295. (**Cover Article**) **Impactor Factor: 11.36(TOP Journal)**
- **Xu, D**.; Hu, S.; Xiong, Y.; Yang, Y.; Ran, Y., 2020. Importance of the structure and micropore of sedimentary organic matter in the sorption of phenanthrene and nonylphenol *Environ. Pollut.* 260, 114034. **Impactor Factor: 8.9**