Maximiliano **Osorio**

Software Engineer

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Work Experience

Software Developer Consultant
Austin, TX

The University of Texas at Austin
Mar 2021 - Present

- Planet Texas 2050 is an eight-year initiative aimed at finding solutions to make our communities more resilient and better prepared. To achieve this, we bring together architects, archaeologists, city planners, public health experts, geologists, engineers, computer scientists, artists, and other specialists.
- Refactored metadata APIs to improve their performance and maintainability using LoopBack 4, TypeScript, OpenAPI, and PostgreSQL.
- Designed and built a web application that allows users to run simulations on High Performance Computing (HPC) clusters without using SSH. The application is developed using FastAPI and React.

Software Developer Consultant
Los Angeles, USA

Information Sciences Institute
Apr 2021 - Present / Jan. 2019 - May 2019

- Collaborated on the Model INTegration (MINT) project, which combines models from various disciplines, including hydrology, agriculture, economics, and social sciences, to run simulations predicting the consequences of actions or policies in specific geographic regions. This work had significant applications, such as in the assessment of food insecurity in Ethiopia (1.2 millon simulations), allowing experts to simulate food production.
- Developed services (APIs, pipelines, workflows) to integrate data from different sources using Python, FastAPI, Express, and PostgreSQL.
- Created Helm charts for deploying services in Kubernetes clusters, such as Information Science Institute, San Diego Supercomputer Center, and Texas Advanced Computing Center.
- Maintained and improved CI/CD pipelines using GitHub Actions.
- Deployed and managed authentication services using Keycloak.
- Integrated a new execution system for running simulations in HPC clusters via APIs.

Research Programmer
Los Angeles, USA

Information Sciences Institute
Jul. 2019 - Oct. 2020

- Collabrate and develop in the Model INTegration project (MINT), MINT project combine existing models from various disciplines-including hydrology, agriculture, economics and social sciences-and run simulations to predict the consequences of actions or policies in specific geographic regions.

Part-time Teacher
Valparaíso, Chile

Computer Science Department
Jul 2016 - Dec 2018

- Proposed and teach a course on Software Deployment on Linux, covering tools such as Docker, Kubernetes, AWS, GitHub Actions, Django, PHP, and Nginx. This course equips students with practical skills for deploying applications.
- Teach the Operating Systems course, where students learn core concepts of operating systems through practical exercises in a Linux environment and related DevOps tools.

Systems Engineer
Santiago, Chile

Linets
Jan. 2014 - Mar. 2016

- Managed system administration for 400 servers, including troubleshooting, configuration, database administration, and optimization.
- Worked with OpenStack to build the first OpenStack deployment in Chile, supporting Beebop, the first public cloud in the country.
- Automated OpenStack deployment using Docker Containers and Ansible playbooks.
- Implemented shared storage for the public cloud using Ceph, a distributed storage system designed for performance, reliability, and scalability.

Systems Administrator
Valparaíso, Chile

Computer Science Department
Aug. 2011 - Oct. 2014

- Administered internal servers, ensuring the availability of services for students and faculty.

Education

M.Sc. in Computer Engineering
Valparaíso, Chile

Universidad Técnica Federico Santa María
Mar. 2017 - Dec 2018

- Thesis: Towards reproducibility of computational environments for Scientific Experiments using Container-based virtualization.

Computer Science Engineering
Valparaíso, Chile

Universidad Técnica Federico Santa María
Mar. 2010 - Jan. 2016

- Undergraduate project: Evaluation of Kubernetes (v1.0.6), an orchestration system for Docker Containers.

Projects

MINT Project

Los Angeles, USA

Developer

Jan 2019 - Present

- MINT assists an analyst to easily use sophisticated simulation models and data in order to explore the role of weather and climate in water on food availability in select regions of the world.
- MINT has been applied by The Defense Advanced Research Projects Agency (DARPA) to the assessment of food insecurity in Ethiopia, where 1.2 million simulations were run to allow experts to simulate food production.
- MINT has been adopted by the Planet Texas 2050 project, which aims to design solutions that will make our Texas communities stronger, more resilient, and better prepared for current and future challenges
- MINT has been used by Supercomputer Center at the University of California, San Dieg to simulate the impact of wildfires in California.

OBA

Co-creator

May 2019 - Present

- OBA reads ontologies (OWL) and generates an OpenAPI Specification (OAS). Using this definition, OBA creates a REST API server automatically.

Skills

Programming Languages

Python, JavaScript, TypeScript, Java, Bash

- Proficient in developing applications, automating tasks, and analyzing data with these languages.

Backend Development

Loopback (Node.js), FastAPI, Express, PostgreSQL

- Capable of developing robust server-side applications and managing databases effectively.

Frontend Development

React, GraphQL, Figma

- Experienced in building web applications.

DevOps Tools

Docker, Kubernetes, GitHub Actions, Ansible, Helm

- Experienced in containerization, orchestration, continuous integration, and deployment.

Cloud Platforms

AWS

- Experience in deploying and managing applications on AWS.

Semantic Web

RDF, OWL, Neo4j Graph Database, SPARQL

- Experience in developing and querying semantic web applications.