Xinyi LIU

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SUMMARY

PhD candidate with a solid CS major, GIS research background, and industry internships at Zoox and ESRI. Has a wide range of project experience, including **full-stack web application development** and **machine learning**. Has 5 years of programming experience for scientific research in model construction and data analysis, strong knowledge of computer science, mathematics and statistics, and programming skills.

EDUCATION

University of Wisconsin-Madison, Madison, WI   **GPA: 3.9/4.0**   Sep 2016 - Dec 2021
MS in Computer Science, PhD in Geographic Information Science (GIS), *Research Grant & Graduate Award*
Sun Yat-sen University, Guangzhou, China   **GPA: 3.8/4.0**   July 2015
BS in Earth Information Science and Technology, *Merit Scholarship (3 times), Excellent Leadership*

SKILLS

Programming Languages: object-oriented design using **Java**; web development using **HTML**, **CSS**, **JavaScript**; statistical analysis using **Python**, **R**, **MATLAB**; database operation using **SQL**
Databases: PostgreSQL, MongoDB, Redis, Oracle; **Cloud Computing Tech:** Hadoop, Spark, PyTorch
Web Dev Tech: Vue, Vuex, three.js, WebGL, React, node.js, jQuery, D3, thi.ng; **OS:** Linux, Windows, macOS

WORK EXPERIENCE

Software Engineer Internship, *Zoox*, Foster City, CA   May 2020 - Aug 2020
• Worked with the Zoox Road Network (ZRN) team to create and maintain HD road network data formats and tooling systems on top of the mapping pipeline built for autonomous vehicle driving planning
• Enabled automatic semantic configuration of ZRN specifications on or off-vehicles by developing data pipelines within Zoox main code repository with unit and integration testing, using Python, Protocol buffers, and Bazel
• Created interactive positioning and time icon decal features for ZRN Web Viewer to support efficient queries on the road networks, with integration of Vue.js, Vuex, Vuetify, three.js, node.js, and Redis, using TypeScript
• Attended weekly sprint meetings and Fixed non-trivial bugs for ZRN Editor with C++

Software Engineer Internship, *Esri*, Redlands, CA   May 2018 - Aug 2018
Demo: https://www.slideshare.net/slideshow/embed_code/key/oLIFc1qv7PzJmf
• Optimized and implemented graph drawing algorithms to transform area-scaled maps into attribute-scaled
• Created a new mapping toolkit for the auto-generation of cartograms in the ArcGIS Pro toolbox by wrapping up the algorithms using Python (ArcGIS Pro: https://www.esri.com/en-us/arcgis/products/arcgis-pro/resources)
• Pushed into production by evaluating 50 test cases, debugging 10 test failures and performing regression testing

PROJECTS

Travel Activity Explorer: Java Web Service (Full-Stack Development)
Sample of 12 KLOC at GitHub: https://github.com/XinyiHolly/LocationPrediction.git
• Developed dynamic web pages to support novel visualization frameworks for analyzing people's movements
• Acquired non-trivial daily travel activity information from sparse spatiotemporal data points
Back End:
• Created Java servlets with RESTful APIs to handle HTTP requests and responses
• Designed data model and built spatial database (PostgreSQL) to manage 30 million geo-tagged tweets and POIs
• Optimized spatial clustering algorithm and integrated OSM data to increase activity detection accuracy by 10%
Front End:
• Architected and implemented the interactive web frontend workflow using AJAX (HTML, CSS and JavaScript)
• Implemented interactive 2D/3D geovisual analytical functions (WebWorldWind API, Google Map API, and D3)

Enhanced Activity Identifier: Data Science and Machine Learning   *In progress*
• Processed time-stamped GPS coordinates and POI datasets by data cleaning, spatiotemporal feature extraction (Java), categorical feature transformation, standardization, and feature correlation (Python)
• Trained supervised machine learning models including Logistic Regression, Random Forest and Decision Trees, and applied regularization with optimal parameters to overcome overfitting
• Optimized travel activity identification model to increase both precision and recall by 5% to 10% for different activity types, evaluated with k-fold cross-validation and confusion matrix