# Zonghao(Wade) Zhang

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## Professional Summary


Experienced GIS Specialist with over five years of experience in spatial data management, automation, and custom GIS applications. Proficient in ArcGIS, QGIS, Python, SQL, and remote sensing tools including LiDAR and high-resolution imagery. Experienced in automating geospatial workflows, building map products from drone and GPS data, and developing web-based geospatial solutions. Adept in spatial analysis and database design for land, environmental, and industrial applications. Strong collaborator with a proven track record of delivering high-quality geospatial outputs across interdisciplinary teams.


## Work Experience

**Sept. 2023 – Sept. 2024** **GIS Specialist**

Global Raymac Surveys, Calgary, AB (Remote)

- Developed **Python Scripts** for automating geospatial workflows, integrating data from multiple sources, and improving project efficiency.
- Managed **Spatial Databases** using **ArcGIS Pro** and **SQL**, ensuring accurate and reliable geospatial data for environmental and cadastral projects.
- Designed and maintained **Web Mapping Applications** using **ESRI ArcGIS Online** and **Web Map Services (WMS)** to support project-specific data visualization.
- Utilized **SDE database software** for storing and serving spatial data to applications, maps, and reports.
- Produced **high-quality data visualizations** and **cartographic products** using ArcGIS Pro for client deliverables in geotechnical and environmental projects.
- Managed **GNSS data post-processing**, ensuring accurate positioning and data integrity for geospatial projects.

**May 2018 – Mar. 2021** **Survey Technologist – Land Surveyor in Training (LST)**

Matson Peck & Topliss (M.P.T. Engineering Co.), Richmond, BC

- Coordinated with survey teams and clients to ensure accurate geospatial data collection using **GPS receivers** and **Total Stations** for cadastral and engineering surveys.
- Processed survey data in the office using AutoCAD, ensuring data accuracy and adherence to project specifications.

## Education

**Sept. 2021 – Aug. 2023** **Master of Science in Geomatics Engineering (M.Sc.E)**

University of Calgary, Calgary, AB

- Developed simulation models using Python and the GAMA platform for optimizing fleet operations in urban environments.
- Analyzed geospatial datasets using open-source **Python Library** and built custom workflows to automate data processing for traffic analysis and fleet management.
- Awarded the Alberta Graduate Excellence Scholarship

**Sept. 2014 – Apr. 2018** **Bachelor of Science in Geomatics (B.Sc)**

British Columbia Institute of Technology, Burnaby, BC

- Earned 223.5 credit hours in total (Diploma: 143.5 / Degree: 80).
- Capstone project: Tunneling surveying for Mount MacDonald, including least-square adjustments to achieve precise geospatial data accuracy.

## Master's Thesis

**May 2022 – June 2023** **Thesis | Multiagent Spatiotemporal Simulation of Autonomous Vehicle Fleet Operation**

University of Calgary, Calgary, AB

- Investigated strategies for autonomous vehicle fleet optimization based on demand fluctuations, aiming to reduce costs, idle time, emissions, and traffic congestion.
- Utilized ABM on the GAMA platform to simulate interactions between fleet agents and commuters, capturing emergent behavior of the entire system.
- Explored diverse scenarios for both people and fleets, including different matching and dispatching strategies to evaluate their impact on customer wait times and unfilled demand.

- Demonstrated how simulation outcomes are influenced by parameters like wait time limits, indicating a need for incorporating real-world data for comprehensive results.

## Technical Projects

**Mar. 2024 – Aug. 2024** **Industry Project | Automated GeoDatabase Update Solution**
Global Raymac Surveys, Calgary AB

- Developed and implemented a Python script using **ArcPy** to automate the updates for the geodatabase, significantly reducing manual errors and improving update efficiency.
- Implemented a logging system to track process execution and errors. Developed an **automated email notification system** to alert stakeholders of update statuses and any issues encountered.
- Conducted comprehensive testing to validate the tool's performance and reliability. Performed **unit tests** and **manual tests** to ensure the tool met all functional requirements and operated seamlessly.
- Provided **training** and technical support to team members on the use of the automated tool.

**Mar. 2023 – Mar. 2023** **ESRI Application Challenge | Cul-Grow: Cultivating Greenspace Growth in Calgary**
University of Calgary, Calgary, AB

- Developed an innovative **web application** focused on urban ecology using **ESRI** technology, completed within a one-week timeframe.
- Collected and cleaned open data from various sources to ensure high-quality, reliable input for the application.
- Performed data mining and analysis to extract valuable insights and uncover meaningful trends related to greenspace growth.
- Produced a comprehensive **pitch video** and **created a website** and **story map** to effectively present the application to stakeholders.

**Jan. 2022 – Apr. 2022** **Website Development | Running Life: A Web-Based Running Tracking Solution**
University of Calgary, Calgary, AB

- Developed a dynamic web map for running route planning and trajectory tracking, adhering to the **REST** architectural style for efficient communication between client and server.
- Built the frontend using React, creating an interactive and responsive user experience.
- Enhanced the user interface with **Tailwind CSS**, optimizing design and functionality.
- Established a robust backend using **Flask** and **MongoDB**, ensuring scalable data management and smooth integration with frontend components.

**Sept. 2021 – Dec. 2021** **Machine Learning | Ship Detection on Satellite Imagery based on U-NET Approach**
University of Calgary, Calgary, AB

- Created a ship detection model using the **U-NET** architecture for satellite imagery analysis.
- Evaluated the performance of the U-NET model with various backbones, including pre-trained ResNet34, to optimize accuracy and efficiency.
- Leveraged **Google Colaboratory (Colab)** for scalable computational resources, enabling efficient model training and testing.
- Built and fine-tuned the model using the **PyTorch** library and managed a dataset of approximately **100,000 satellite images**, ensuring data quality and effective preprocessing for model training.

## Technical Skills

- **ESRI Products:** ArcGIS Pro | ArcMap | ArcGIS Online | StoryMaps | Experience Builder | App Builder | Workflow
- **Programming Languages:** Python | SQL | R | JavaScript | HTML
- **Python Libraries:** ArcPy | GeoPandas | GDAL | PyTorch | scikit-learn
- **Other Software:** QGIS |AutoCAD | TBC | FME | Microsoft Power BI
- **Technologies:** Cloud Computing (AWS) | SQL Data Management (Microsoft SQL) | Web Map Service (WMS)

## Professional Affiliations

- **BC Land Surveyor in Training (LST)**
- **Canadian Association of Snowboard Instructors (Level.2 Instructor & Leve.1 Park)**

## References

- **Eryn Gibbs BCLS, ALS**
  Former Project Manager, Global Raymac Surveys
- **Dr. Emmanuel Stefanakis PhD, PEng**
  Department Head, University of Calgary, Schulich School of Engineering, Department of Geomatics Engineering