

# Bowen Luo

Portfolio: [plopior.github.io](https://plopior.github.io) | Email: [bowen.luo@gmail.com](mailto:bowen.luo@gmail.com) | Github: [github.com/plopior](https://github.com/plopior) | Cell: 206 636 8848

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**Interests:** ML, Graphics, HPC, Distributed & Cloud, Networks, Optimization, Compilers, DBs  
**Tech Stack:** Python, SQL, Java, C++, C, C#, Go, CUDA, Angular, JS/TS

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## EDUCATION

**University of Chicago** | Masters in Computer Science | Data Analysis

*Dec 2024 expected*

**University of Waterloo** | Bachelor of Computer Science | Combinatorics & Optimization Minor

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## EXPERIENCE

**ZS Associates** | Software Engineer (Python, Angular, SQL) *Chicago*

*June 2024 - Aug 2024*

- Individually researched and prototyped a dashboard using a variety of generative AI models on AWS (Lambda, Bedrock) for **improved zero-shot cross-context text summarization**.
- Built Angular webpages and pipelines for Pharma data visualization and analysis, **boosting retention and product appeal for new Fortune 500 clients**.
- Built big-data streaming and distributed computing pipeline on AWS (Kinesis, EMR) for **improved client data ETL**.

**Arista Networks** | Software Engineer (C++, Python) *Vancouver*

*Sept 2022 - Dec 2022*

- Individually developed network switch CLI commands to asynchronously query information on routes in the forwarding tables across VRF instances, **improving routing telemetry data**.
- Prototyped efficiencies** to routing table adjacency trimming by consolidating optimizations done during next-hop creation and interface-down adjacency review.
- Built test framework features **detecting tight-loops** in tasks of ASIC platform agents at runtime.

**Oracle Netsuite** | Software Developer (Java, SQL) *Remote*

*Jan 2022 - Apr 2022 & May 2021 - Aug 2021*

- Planned architecture** of and implemented objects/services for a new data storage (UMD) and manipulation pipeline; wiring (Guice), persisting, and exposing SQL entries to **perform Oracle Netsuite platform rewrite**.
- Built full-stack React/Preact webpages and data pipeline services, researching and implementing UMD record querying for request validation.
- Individually wrote and upgraded endpoints to fetch and manipulate SQL data.
- Implemented scheduled SQL tasks and contributed to a web-based frontend (UIF, JavaScript), **delivering continuous features for client requests**.

**Martello Technologies** | Software Developer (C#) *Remote*

*Sept 2020 - Dec 2020*

- Individually upgraded the backend codebase of a data consolidation platform (ELK Stack, Akka.NET), migrating between major versions of Elasticsearch and **creating new data visualization options**.

**VirtaMove** | Software Developer (C++) *Remote*

*Jan 2020 - Apr 2020*

- Individually developed a feature detecting the memory-mapped compiled bitness for Windows binaries, **improving app migration success rates** across Windows OS of varying architectures.
- Individually developed a native file and registry rehosting service migrating between matching OS, working with kernel interfacing Windows API to query services, registries, and binaries.

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## Amgine | Junior Developer (C#, Python) *Toronto*

*May 2019 - Aug 2019*

- Researched and prototyped improvements (GRU, ELMo word embedding, attention layers) to a bidirectional NLP ML model (Keras, Tensorflow), **improving sentiment analysis of emails**.
  - Wrote a custom JSON parser and email tokenizer to **enable training data transfer/generation**.
  - Generated C# classes (T4 text templates) for dynamic JSON parsing.
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## PERSONAL PROJECTS

### Raytracers | C++, Go

- **Photorealistic raytracer** with supersampled anti-aliasing, mirror/glossy reflection and refraction, soft shadows, texture and bump mapping, and Phong illumination.
- **Parallelized raytracer** with BSP parallelism for raytracing, Phong illumination and Gaussian denoising, implemented with a CV-based barrier and lock-free DEQueue for work-stealing between threads.

### Video Frame Extraction | Python, Angular

- Prompt-based frame extraction from videos using Hugging Face and OCR algorithms with UI.
- Conventional approach with BLIP and GPT2 models for image captioning. Sentence embeddings and cosine similarity for prompt matching.
- CLIP model for contrastive approach with combined frame and prompt embeddings.

### Machine Learning Models | Python, Java

- Semi-supervised image classification **model** on MNIST using K-means and KNN for cluster labeling.
- Perceptron-based neural networks demonstrating **evolutionary** and **back-prop** algorithms.

### Autochess Data Analysis | Python

- Data analysis on the Teamfight Tactics auto-battler using RiotAPI, Pandas, and FastAPI to extract relevant gameplay trends and strategies from matches between current top players.

### Connect - Hack the North | Java, Android Studio

- Service to send/receive NDEF messages using near-field communication. Prototyped sending images and PDFs as URI.
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## COURSEWORK

### University of Chicago

- MPC53111 Machine Learning | PCA & SVD. Clustering. Bayes. Boosting.
- MPC53113 NLP | Embeddings. RNNs & LSTMs. Attention & transformers.

### University of Waterloo

- CS488 Computer Graphics | OpenGL. Raytracing & rasterization. Scene object hierarchy.
- CS480 Machine Learning | SVMs & regression. Convolution. GANs.
- CS486 Artificial Intelligence | DTs. RL. States & Markov Chains.
- CS484 Computer Vision | Panorama. Epipolar geometry & stereo. Viterbi & semantic segmentation.