

# Sheldon Frith - CV

*Software developer with a proven track record of delivering novel full-stack solutions. Strong technical abilities, excellent communication skills and a lifelong-learner attitude.*

## Software Project Highlights

### Ground Properties Predictor | [app.umny.ca](http://app.umny.ca)

**Objective:** Improve geothermal performance, reduce project risk and feasibility costs by remotely predicting ground properties

**Tech Stack:**

- *ML Development:* Custom-built HPO and data-processing software
- *Backend and Feature Server:* GDAL, Flask, nest.js
- *ML Models:* Custom ensemble using PyTorch and scikit-learn
- *Frontend:* Typescript, next.js, Stripe, Auth0

**Impact:** Achieved world-wide average error of less than 1 °C, for predictions of below-ground temperatures. Created new soil thermal conductivity model 33% more accurate than previous state-of-the-art models. Save clients weeks of time, and an average of \$50k per project.

### Geothermal Monitoring and Control Software | [Sales Page](#)

**Objective:** Remote monitoring and control of experimental and cutting-edge Geothermal HVAC systems, including scheduling and safety fallback operations.

**Tech Stack:**

- *Backend:* C++ ASP.NET Core
- *Database:* MySQL RDS
- *Frontend:* Next.js, Typescript
- *HVAC Control:* Distech EC-gfxProgram

**Impact:** Enabled remote control, reducing the need for on-site visits by 100% and saving the client an estimated 40% of maintenance hours per month. Improved functionality and adaptability of the system, meeting specific client needs that the previous monitoring software could not.

### GeoPile Predictive Software | [Demo Video](#)

**Objective:** Automatic design and optimization software for Geothermal pile HVAC systems

**Tech Stack:**

*Backend:* C++ ASP.NET Core  
*Database:* MySQL  
*Frontend:* React.js  
*ML Models:* custom scikit-learn ensembles

**Impact:** Cut design time from months to minutes, and cut costs by an order of magnitude, allowing rapid design iterations and quicker project turnaround

#### Languages

Typescript + JS  
C#  
Python  
C++  
Rust  
PHP

#### Back End

ASP.Net Core  
MVC  
Nest.js  
Flask  
Laravel  
Bevy

#### Front End

React  
Next.js  
CSS/SASS  
styled-components  
tailwindcss

#### Machine Learning

PyTorch  
SKLearn  
Optuna  
GDAL  
OsGEO

#### Databases

MySQL, SQLite  
Relational  
Databases

#### Integrations

Stripe  
Telegram  
Shopify  
Auth0  
Cognito  
Google Maps  
ChatGPT

## Recent Personal Projects

*Selected projects from 17+ years of software development:*

**GPU-Accelerated Collision Detection** ([github.com/Sheldonfrith/gpu\\_collision\\_detection\\_bevy](https://github.com/Sheldonfrith/gpu_collision_detection_bevy))

Bevy + Rust project demonstrating 50% performance gains for massive-scale collision detection using GPU shaders (Vulcan + WGSL).

**Local Jargon Translator** ([sheldonfrith.com/translator](https://sheldonfrith.com/translator))

Demonstration of LLM API integration into custom web apps, utilizing prompt engineering (RAG, ToT, chaining, etc.) to generate 95% accurate translations of local jargon for travelers abroad.

**WASM Speed Tester** ([sheldonfrith.com/wasm-speed-tester](https://sheldonfrith.com/wasm-speed-tester))

Web app testing the execution speed of sorting algorithms, demonstrating 100+% speedups using C++ Web Assembly compared JavaScript.

**C++ ML Framework** (proprietary)

End-to-end ML model creation framework, including novel HPO algorithms, data splitting algorithms and meta-learning, designed to allow training on edge devices, improved.

## Recent Work Experience

### Lead Software Developer

Umny Inc.

May 2021 – Present

- Lead all software development and related tasks (architecture decisions, AWS, sysadmin, database design, etc.)
- Build all Machine Learning models used in software (mostly deep neural networks) from end to end, including data generation, data collection, data processing, feature selection, model/algorithm selection, HPO, validation, testing, serialization and deployment.

### Lead Software Developer

Sharp AR

Sept 2020 – May 2021

- Built a custom Shopify plugin/app to allow easier, more customizable Augmented Reality (AR) integration into stores.
- Built an embeddable AR service (built on Google's "model-viewer") which could work in any existing website.

## Education

### Bachelor of Mathematics and Computer Science

Athabasca University - **Expected Graduation: December 2026**

## Additional Skills and Experience

- Bilingual: Native English speaker and fluent in Spanish
- Self-management on long-term projects
- Team collaboration in diverse, cross-functional teams
- Advanced mindfulness training with demonstrated focus and stress management capabilities