

Mark Farrell

Undergraduate Student ☆ Software Developer

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Summary of Qualifications

- Proven ability to learn and reason creatively.
- Strong software implementation skills.
- Eager to solve difficult problems in computing.

Technical skills

- Core Programming Languages: **Scala** **Java** **JavaScript**
- Specialties: **Geospatial Programming** **Information Extraction**
- Interests: **Linguistics** **Digital Art & Animation**

Education

Candidate: Bachelor of Computer Science

Sep. 2013 – Present

- Plan Name: Honours Computer Science (Co-op)
- Institution: University of Waterloo

Professional Experience

Software Developer at Defence R&D Canada

May. 2014 – Aug. 2014

- Worked for a Defence Scientist doing research on a new method for vessel identification: one that resolves the identities of all tracked unidentified vessels at the same time.
- Developed software for estimating static attributes of tracked unidentified vessels: their Arctic ice classes, fuel capacities and water displacements.
- Acknowledged in the paper titled "Joint Identification of Multiple Tracked Targets", submitted to the Journal of Information Fusion.
- Co-op Rating: **Outstanding**
- Skills Developed: **Geospatial Programming** **Public Speaking**
- Tools: **AIS Datasets** **NOAA Environmental Datasets** **Scala** **Scalaz** **PostgreSQL** **PostGIS** **Geotools**
Jetty **FTP4j** **SLF4j/Log4j** **Git** **Vim**

Research Experience

Bioinformatics Researcher at UC Berkeley / Berkeley Lab

Center for Research and Education on Aging

Feb. 2014 – Present

- Developing software to automate the construction of biomedical knowledge bases — specifically, a knowledge base on aging.
- Designed and developed software that compiles text into graphs.
- Extracts knowledge from text articles, retrieved from sources like PubMed.
- Relates literal nouns by the actions that they perform on each other.
- Worked online; flew down to California to give a presentation titled "**Constructing a Knowledge Base on Aging: an Automated Approach**".
- Source code available **here**.
- Skills Developed: **Natural Language Processing** **Information Extraction** **Data Visualization**
- Tools: **Scala** **Scalaz** **Scala.js** **The Berkeley Parser** **Gephi** **Sigma.js**

Ironbane - a FOSS MMORPG written entirely in JavaScript

- Improved server architecture by partitioning the game's map into cells. Each cell owns a region of the map and is a concurrent actor that updates its AI only when players are inside of it.
- Allows for a larger game world to be created.
- Optimizes server performance for the intended gameplay experience.
- Pull-request can be found [here](#).

Starfall - a 3D space MMORPG demo

- Supports logging in, cockpit-style controls and collision detection.
- Modelled 3D art assets in Blender.
- Developed server software in C++.
- Prototyped client software using Unity3D.
- Released as open-source [here](#).

Fitlings Pedometer Game - for Shad Valley Entrepreneurship Cup

- Prototyped an Android game aimed at reducing obesity rates in youth.
- Used the accelerometer found in Android devices to create a setting where the player has to walk in order to keep their avatar healthy.
- Teammates created business plan and art assets.
- Awarded 3rd place for Best Application of Scientific Principles.

Titans-Server - server emulators for Universal Century Gundam Online

- With Brian Burnett and Vince Macchia, reverse engineered the game's packet protocol.
- Wrote server emulators in Java, allowing users to try the game again after the official service was cancelled in 2007.