Kathy Murdoch

kathy@nivan.net   github.com/iguanaonmystack

Profile

I am a software developer with 16 years of professional experience. My areas of interest are information retrieval, technical documentation, API design, and knowledge of Python's inner workings. I have a strong drive to work more with people, and increasingly feel my strength lies in sharing and communicating my technical expertise with others. I manage my time well, always keep thorough documentation of my software, and have a strong focus on code maintainability. I have worked remotely full time in all my jobs since 2015, and I am happy to attend periodic meet-ups.

Employment History

- 2021–2023: **Senior Engineer, Prolific Academic Ltd.**
  - Architect for a new money subsystem within the product to solve the largest support issue regarding inaccuracies in invoices. This involved speaking with various shareholders within the company, including the support, finance, and design teams, and collecting feasibility feedback from other developers.
  - Implementation of a new payment provider to removing Prolific from the flow of funds between researchers and research participants.
- 2020: **Senior Developer, New Forest Ventures Ltd.**
  - Various projects for external clients, broadly centred around genomics. Of note: development of a full **Celery**-based pipeline and **Django** web UI for performing imputation of human genome samples, intended to be bundled with a genotyping array workstation or run on non-technical scientists' computers; extension of a client's **R** software library to handle new file types.
  - One-to-one mentoring of a junior colleague.
- 2011 – 2020: **Lead Search Architect / Senior Software Engineer, Attraqt Group Plc.**
  - Lead architect and developer of the search engine for Attraqt's online merchandising platform. The search engine is a proprietary **C** library with **Cython** bindings to enable direct use from **Python**. It was designed to index both general text data as well as specialised product catalogue data. This has given me a solid understanding of the processes involved in **information retrieval** and involved implementing **Unicode handling** from scratch, **query parsing**, **network replication** of indices, **code optimisation**, **spell correction**, and efficient file storage formats.
  - Lead architect and developer of a **RESTful API** for interacting with internal services. This uses **Flask** to provide the API and uses some Cython to improve throughput in time critical areas. It involved interacting with other teams within the company to ensure functionality was suitable and convenient to use. Additionally I developed a custom test rig for the API to make writing tests for it as simple as pasting request bodies into files in a directory and writing some accompanying assert statements into a second file.
  - Experience with client design meetings for discussing ideas and suggestions.
- 2006 – 2011: **Developer, Attraqt Group Plc.** (at the time known as Locayta Ltd)
  - I developed and delivered a bespoke comparison shopping solution for a high-profile high-street client. This included architecture of a sharded indexing system to process millions of products each night.
  - Technical support for developers using Locayta Search Mobile, the company's iOS search library. This included contributing to the **Objective-C** bindings for the search engine C library, and sole development after the original author left the company.
  - Maintenance of a telephone directory service for a client, using the **Xapian** search engine library.
  - Extending Xapian's Domain Specific Language "Omegascript" in **C++**.

Education

- 2003 – 2006: **University of Kent at Canterbury: Computer Science - BSc (Hons)**
  - Final year modules: Group Project (GUI chat client in C/GTK+); Dynamic Web; Human-Computer Interaction; Computer Graphics; Computer Security and Cryptography; Cognitive Neural Networks; Mobile and Ubiquitous Computing.

Skills

Python 2 and 3

- 16 years professional experience as a primary language developing web applications, APIs, and utilities.
- Experience with the following frameworks and modules:
  - Web frameworks: **Flask**, **CherryPy**, **Django**.
  - **Genshi/Kajiki**, an XML-based templating language and **Jinja2,** a templating language based on Django's.
  - **Celery**, a task queue framework.
  - **Cython**: including implementing bindings for a C library. Some experience with **ctypes** and **cffi**.

C

- Ten years professional experience developing core C software.
- Experience in optimising and debugging complex codebases (e.g. gdb, valgrind, kcachegrind).
- Implemented a wide variety of different features in a proprietary high-performance search engine, including B-tree file storage formats, full Unicode support from scratch, and query parsing using the flex parser generator.

Other languages

- **C++:** Five years professional experience maintaining and extending existing C++ projects.
- **Objective-C:** Two years professional experience including development for iOS.
- **JavaScript:** Competent at writing cross-browser web applications with fall-back for non-capable browsers. Familiar with the **MochiKit** and **jQuery** libraries.
- **SQL:** Experience designing and maintaining **PostgreSQL** and **SQLite** databases as part of web applications.
- **R:** professional experience during one short project as the main language.
- Experienced with mid-level **XHTML** and **CSS** in a cross-browser environment.
- Adept at **bash** and the usual command line tools for scripting tasks.

Software and Libraries

- Ten years experience using **Xapian** as a search engine library from C++ and Python.
- **Debian Linux:** Home and professional user since 2005. Highly familiar with usage and everyday administration, professionally and personally. Also experienced with **Ubuntu**, including administration of servers. Experience with packaging and deploying software using pip, apt, and autotools.
- Deployment of code on servers using **Fabric**, **Docker**, and **docker-compose**.
- Adept at **git**, **subversion**, **vim**, **screen**, and general Linux command line utilities. Vim is my editor of choice.
- Other *NIX: Familiar with basic administration of **Red Hat/CentOS** and **Solaris** servers.
- **MacOS:** Familiar with usage, administration, and software development (including **Xcode**).

Personal Interests

- Conferences:
  - 2019: BarCamp London XI: I volunteered with the running of the conference, and presented a talk and discussion on democracy in the UK.
  - 2018: PyCon UK: I presented a talk called *A Cython Walkthrough*.
  - 2014: BarCamp London X: I presented a talk called *Anatomy of a Search Engine*.
- Coding:
  - 2015 – 2023: I wrote and run an instance of wikitweets, a bot that tweeted edits to Wikipedia.
  - 2010 – present: **BitlBee** (bitlbee.org). Various patches and additions to the main source code and to some external plugins, and technical user support in the #bitlbee support IRC channel.
  - Various small projects on github; of note: NaNoGenMo, a bot attempts to write a novel based on the output of a procedurally generated world; Evolutron, an evolutionary AI toy simulating 2D creatures; and a large contribution to PyNode that allowed back-and-forth calling of functions and modules between JavaScript and Python.
- My other hobbies include roller skating, learning art, and creative writing. I've also managed community fan projects such as https://stcreillustrated.carrd.co which recreates old comics as fan offerings, which involves coordinating the 30-odd artists per issue.