William A. Freeman

420 Tibbetts Hill Road
Goffstown, NH 03045-3023

cell phone: 1 (603) 315-7662
On line: "http://ke1g.org/contact/"

I am seeking a position as a software engineer or project leader.

SKILLS

Programming languages
- Python
- C/C++
- JavaScript

Some experience with Lisp, Java, Fortran, sh, bash.

Web and network framworks, tools, and technologies
- Django (celery, south, pages and fiber CMSes, haystack with whoosh, satchmo, custom apps)
- Tornado (user authentication against LDAP)
- Twisted
- JQuery, JqueryUI, (just a bit of D3)
- HTML, XML, SOAP
- CSS
- AJAX, WebSockets
- Redis (via both redis-py and tornadoredis)
- PostgreSQL, MariaDB (MySQL clone), SQLite, mongo
- Apache, mod_wsgi

Non-Web application programming
- Fabric
- AMQP (RedHat MRG version of Qpid/QMF, RabbitMQ via celery)
- WxPython applications
- Command line tools
- Embedded software

IDEs, debuggers, other tools
- Emacs
- IDLE
- Eclipse
- gdb, pdb
- Mercurial (DVCS), git (+ github), subversion
- virtualenv
- ssh, openvpn
- Jenkins
- TeX, LaTeX

Programming environments, targets
- POSIX systems, including Unix or Unix-like systems, Linux in particular
- MS Windows, MS-DOS
- Various bare metal micro-controllers (MicroChip, ATMega)

Rusty history
- Device drivers
- Data transformation and reduction (coordinate transforms, curve fitting, format translation, etc.)
- Operating system kernel (especially VM & MM)
- Graphics
- Visual Studio (VisualC++, VisualJ++)
- A number of assembly languages

EXPERIENCE

Feb 2013-Present   **Dealertrack Technologies, Inc.**
        Lake Success, NY
No calls at this time

Software engineer.

1. "Partner" emulator. DT's main product forwards automotive credit applications to a variety of lenders and collects the responses. The emulator replaces the various lenders during development and regression testing. A DNS tweak directs applications to the emulator instead of to a DataPower instance (which is used to pierce our firewall, reformat, sign, and encrypt applications). Django on MariaDB receives the applications, parses them, and scheduled delayed responses (approved, declined, etc.) via Celery.

2. Update web based tool for monitoring a set of Mule applications.

3. Python interface code between main DT web front end and new style of Mule flows.

4. Framework for writing remote monitoring and configuration plug-ins. Using fabric and the underlying paramiko to ssh into a variety of servers. Others wrote simple plug=ins for Mule and httpd. I wrote a magor plug-in for monitoring and control of QPID, including the movement of messages between queues, to/from files/mongodb.

5. Improve multi-tenanting code for Django front end so that it is invisible in NewRelic, allowing the individual views to show up in the histograms.

6. Implement NewRelic monitoring of QPID.

7. Web based interface for the monitoring and management of a system of selected queues on AMQP brokers. The AMQP system uses RedHat's MRG implementation, a repackaging and extension of the Apache Qpid system. Qpid provides for reading queue statistics and doing limited management via a protocol called QMF. Not counting a stock Redis server, three pieces are involved:

> Using python libraries to speak QMF, basic Qpid messaging, and Redis, a python based process provides publishing of status changes (provided asynchronously by the Qpid brokers) to Redis, copying of selected messages to Redis, and accept commands from a Redis subscription.

> A separate python process uses Tornado and TornadoRedis to server an initial page and provide a WebSockets connection to pass those status changes and browsed messages on to the user's web browser and to Redis publish commands from the user's browser (to be read by the QMF process). Session management with user authentication using LDAP (against an AD server).

> Javascript (served by Tornado) in the user's browser: speaks to Tornado using WebSockets; presents bar graphs of the current "fullness" of the monitored queues (jQueryUI progress bar) and overlaid text information; provides a context menu on each queue; allows the creation of "group labels" between queues, allows queues to be hidden and reordered (jQueryUI draggable), with the arrangement being able to be named and saved to/restored from Redis (persistence) and/or user files; allows fetching of a queue's worth of messages or selected messages from multiple queues for display in a dynamically created and shown table; and allows downloading of such messages to a file on the user's machine or the server, and uploading htem again to the same or a different queue. (jQueryUI dialogs and position are used, along with a Context Menu library for jQuery that needed to be improved for the project.)

In addition to the pub/sub channels, Redis holds a cache of the most recent statuses so that newly started Tornado processes can quickly populate their own caches, rather than waiting for the brokers to send an update. This, in turn, allows newly connected user browsers to have the queue status information they show be populated immediately upon connection. (jQueryUI, WebSockets, Redis, AMQP/MRG/Qpid/QMF were all new to me at the start of this project.)

Mentor python noobs.

Apr 2008-Nov 2012   **Appropriate Solutions, Inc.**
      Peterborough, NH
Call Ray Cote at 1 (603) 924-6079

Software engineer. Web site development. Automated web service tools. Data conversion from various older systems. Desktop applications. Deployment and maintenance scripts.
- Create, deploy, and maintain a number of Django an Plone based web sites, not including styling, but including some of the more complex JavaScript based behaviours. Some deployments were to the cloud, some virtual private servers, and some shared hosting.
- Automate download of advertising performance data from Google, Microsoft (and previously Yahoo).
- Automatic download of RETS (realestate data).
- Graphing display of advertising perfomace data.
- Create web service proxy to replace credit card numbers with tokens on the fly, to make the merchant back end web service trivially PCI compliant.
- Desktop form entry application for telephone order takers.
- Reverse engineer schools bus tracking system (when original company had disappeared).
- Make tool to aid in recover of data from a gzipped file that had been ftp'ed in text mode.
- Mentoring of those new to Python and/or Django.
- Occasionally help with Linux and LAN administration.

2006-Nov 2007   **Visible Assets, Inc.**
      Stratham, NH
Call Pete Abell at 1 (603) 598-0607

Software engineer. Also Sys Admin, Tech writer, product installer.
- Write report generator, other minor tools (Python).
- Write Python library to support access to product devices via serial and TCP/IP connections.
- Maintain office LAN, software installation on Windows, Mac OS/X, and Linux computers, including PostgreSQL configuration.
- Replace defective units, design and install antennas and new equipment at demonstration site.
- Analyze hardware failure modes.
- Edit/author documentation, marketing materials, standards submission documents.

2006 04-07 **I'm In/GroupGo, LLC**   **Waltham, MA**
Call Brian Harrington or Josh Lesnick at 1 (781) 768-5501

Software engineer. Implement portions of AJAX web application for upcoming group travel planning web site.
- Client side work in JavaScript (ECMA script) using Prototype, Scriptaculous, Rules, and other js libraries, manipulating the DOM, targeting IE, Firefox, and Safari.
- Server side scripting using mod_python's publisher and PSP, performing mash-ups, file upload, file exchange with external sites, interface with XML feeds and external web apps (Flickr, Qoop, etc.)
- Write Python parsing tools for relatively static (ftp based) feeds.

Convert some of the mod_python code to Java/JSP under Tomcat/Spring (when decision was made to go all Java)

2005-2006 **Epic Research**   **Bedford, NH**
　　　　　Call Ed Berg at 1 (603) 666-0206

Hardware/software consultant. Design recording environmental monitor. This stores periodic sensor readings in FLASH memory for later readout at a workstation. The device is miniaturized and battery powered for unobtrusive inclusion in product packaging. A recipient can know if product environmental limitations have been exceeded during shipping or warehousing.
-   Design overall architecture of system
-   Design communications protocol between monitor and readout station (asynchronous, adapts to speed variation due to use of RC clock for monitor's micro-controller)
-   Design monitor proper (PIC micro-controller, I2C sensor, I2C FLASH, "watch" crystal, battery, passive parts)
-   Design reader circuitry (RS-232 level translator, power supply, pull-ups, contact points)
-   Write code for monitor (PIC, use assembler to fit in part with 2048 words of memory, including software UART and software I2C master code)
-   Debug PIC code via simulation
-   Lay out printed circuit board for monitor
-   Write code for readout workstation (Python, pySerial, for portability)
-   Breadboard readout interface (eventually needs a PWB layout, still researching interface probe point mechanicals)

2004-2005 **Ka Labs**   **Sunnyvale, CA – Goffstown, NH**

Hardware/software engineer. Develop hardware and software supporting a line of high end consumer electronic gadgets, such as high end remote control, digital picture frame with pictures updated over WiFi. (Out of money, and the vendor of the crucial processor chip decided not to manufacture it after all. Had this two man start-up survived, I would have written application and kernel code.)
–   Designed power supply (including novel scheme for software control of CPU core voltage)
–   Performed schematic capture (mostly selections from reference designs)

1999-2004 **Micro Interconnect Technology**   **Bedford, NH**
　　　　　Call Ed Berg at 1 (603) 666-0206

Chief Hardware/software engineer. Develop software and hardware supporting a new PWB (printed circuit board) manufacturing process in which the circuit image goes directly from computer to bare copper clad board. This allows for rapid prototyping, bypassing the making of a photo tool, coating, UV exposure, and dark room processing.
–   Designed and implemented mechanical/hardware/software system to transport a board through a modified laser printer. A one axis table was controlled using a PID (proportional, integral, derivative) motor controller, discrete FET buffer amplifier, discrete component interface to laser printer timing signals, and a GUI Windows Application (written in VisualC++)
–   Designed process to convert incoming "Gerber" files to PostScript for the printer
–   Designed temperature controller for fusing oven
–   Designed bi-polar very high current (100A) amplifier for electroplating with reverse polarity pulses to break up bubbles
–   Automated metrology of scanned images of boards (using a package called Optimus and its scripting language ALI) to measure spatial distortions introduced by the printing process. Wrote software (Python) to massage coordinates in our PostScript files to pre-compensate for these spatial distortions. Wrote GUI application (Python, TkInter) to ease tweaking of the pre-compensation adjustments to be applied.
–   Designed, built, and wrote code (PIC assembler) for a digital RPM gauge for our CNC driller/router
–   Wrote code (python) to generate router programs (for the CNC router) from very simple descriptions of the board outlines and the panelization

- Ran imaging system and CNC driller/router for boards produced during trial period
- Designed and wrote code (SX micro-controller assembler) for an instrument to measure signal edge times very precisely, and communicating with a host PC using IEEE-1284 (enhanced parallel port)
- Maintained company's web site
- Administered in-house computers, installing hardware, operating systems (Linux, Windows) and applications, installed LAN, fixed broken computers, including virus and spy-ware removal, and set up backups over the LAN (using Amanda)

1998-1999 **Mercury Computer Systems**   **Chelmsford, MA**
199 Riverneck Road, Chelmsford, MA

Principal Software Engineer. Maintain and develop systems and libraries for downloading, running, and debugging parallel mathematics codes on Mercury's NUMA parallel processor arrays

1993-1998 **Digital Equipment Corp. (now HP)**   **Nashua, NH**
110 Spit Brook Road, Nashua, NH

Principal Software Engineer, Digital Unix Kernel Tools group. Maintain crash dump functionality from panic through analysis, as well as tools for debugging live kernels, and kernel performance monitoring tools.
- Enhanced kernel crash dumps to be able to span multiple swap partitions when any one partition is too small
- Enhanced kernel crash dumps to compress memory data before it is written to swap partitions. Designed a novel compression method that allows the software that examines the dump to quickly seek to any data within the dump without having to decompress other parts of the dump. Modified a library used by dump examination tools to read from dumps to understand the compressed format
- Enhanced kernel crash dumps to write the compressed dump, rather than into swap space, instead into memory that has already been dumped from. This left enough room to reboot the system with the memory containing the dump temporarily protected from use by the kernel. This saved the time otherwise needed to the dump write it to and then, after reboot, read it back from swap partitions. Provided for the dump examination tools to be able to access the dump there in memory, meaning that you might not have to save the dump to a file at all.
- Enhanced debugger remote slave to switch to its own stack at breakpoints, allowing, for example, "call this function with these arguments" functionality

1992-1993 **Concurrent Computer Systems Corp.**   **Westford, MA**
One Technology Way, Westford, MA

Software Engineer, Unix kernel, Virtual Memory component. Maintain VM system, port VM system to MIPS 4400 CPU chip and NUMA system configuration

1986-1992 **Alliant Computer Systems Corp.**   **Littleton, MA**

Consulting Engineer, Operating System Group
- Extended virtual memory imposed limits on the size of a file from 2^{31} bytes (2Gb) to nearly 2^{58} bytes
- Implemented paging of shared memory regions and mapped files
- In the porting of the Unix kernel to the I-860: ported all VM functions, system call dispatcher, signal delivery, user debugger support and start-up code; designed context switch code, kernel address layout, user and kernel sharing of debugger hooks, and a method of debugging the exception handler (an interesting problem because the breakpoints needed for debugging use this same exception handler)
- Wrote device driver for, and aided vendor in the debugging of, an asynchronous serial line multiplexer

- Implemented fast HiPPI "driver", dedicating one CPU to keeping the HiPPI DMA hardware stoked

1982-1986 **<u>Bedford Computer Corp.</u>**   **Bedford, NH**
   Call Ed Berg at 1 (603) 666-0206

   Hardware Engineer
   - Technical manager on a customer special project contract, which involved both hardware and software development
   - Project leader, architect, and micro-coder, of a smart interface for the IBM-4250 erosion printer
   - Designed 68010 based CPU board, including snoopy data cache and cached TLB memory management unit
   - Designed various Multibus peripherals
   - Designed slave processor board with integral raster display generator, and ported the display portion of the company's primary application product to run on the board

1981-1982 **<u>Lisp Machine, Inc.</u>**   **Cambridge, MA**

   Hardware Designer. Designed video crossbar switch for connecting office "terminals" to available compute resources, designed debugging and diagnostic console (based on an Osborne 1 CPM box)

1980-1981 **<u>Analogic Corp.</u>**   **Wakefield, MA**
   8 Centennial Drive, Peabody, MA 01960, (978) 977-3000

   Hardware engineer. Design a scan converter for phased array medical ultra-sound imager

1979-1980 **<u>Rockwell-Collins, Government Avionics Division</u>**   **Cedar Rapids, IA**
   400 Collins Rd NE, Cedar Rapids, IA 52498, (319) 295-1000

   Hardware Engineer, Global Positioning System (GPS) receiver project. Liaison with CPU group for CPU board, Design bus interface of other receiver boards
   Held DOD Secret clearance.

1976-1979 **<u>Bedford Computer Corp.</u>**   **Bedford, NH**
   Call Ed Berg at 1 (603) 666-0206

   Chief (Hardware) Engineer. Designed Unibus peripherals, add-on caches for PDP-11s, a raster display system, and a custom keyboard, wrote diagnostics for our custom hardware and other hardware related software

1972-1976 **<u>MIT Artificial Intelligence Lab.</u>**   **Cambridge, MA**
   545 Technology Square, Cambridge, MA 02139, (617) 253-6765

   Staff (Hardware Designer), Division of Sponsored Research. Design various peripherals for PDP-10 and PDP-11 systems, and various other digital devices

EDUCATION

1972   Bachelor of Science in Electrical Engineering, MIT (Massachusetts Institute of Technology), Cambridge, MA

VARIOUS

Hobbies
- Amateur Radio ("Extra" class license KE1G)
- Ballroom dancing and performing
- Building electronic devices involving PIC micro-controllers, music, Morse code, and model railroading.
- Choral singing (barbershop, Christmas caroling)
- Home automation
- Model railroading

Other
- Charter member of the Greater NH Linux Users Group and of the New Hampshire Python users group
- Private pilot (PP-SMEL-IA – ME-VFR)
- United States citizen