

# Nathan J. Graham

**website:** www.nathangraham.info **address:** Kansas City, MO

## Experience Highlights

- Extract, Transform, Load (ETL) software and infrastructure development for i2b2 and PCORnet Common Data Model (CDM) clinical data warehouses:
  - Healthcare Enterprise Repository for Ontological Narration (HERON) with over 2 billion facts on over 2.5 million patients
  - Greater Plains Collaborative Reusable Unified Study Environment (GROUSE) which is currently in early implementation but will include clinical data from multiple sites linked together with data from the Centers for Medicare and Medicaid Services (CMS)
- Creation of disposable Docker containers for portable ETL/software development and production environments
- Administration of enterprise Oracle databases (10g, 11g, 12c)
- Familiarity with Epic Clarity relational database schema
- OS and application administration/maintenance of user-facing enterprise systems
- Engineering and consulting team leader
- On-site technical consulting for Cerner point of care solutions
- Software development of embedded, desktop, server applications from Windows, OS X, and Linux environments - languages include SQL, Python, C, and C++
- Centralized and decentralized version control systems (Git, Mercurial, StarTeam, CVS)

## Professional Experience

### EquipmentShare - Kansas City, Missouri

**Automation Engineer** June 2017 - Present

### University of Kansas Medical Center - Kansas City, Kansas

**Senior Enterprise Systems Engineer** April 2016 - May 2017

**Biomedical Software Engineer** March 2012 - May 2016

- Collaborate with the Harvard SCILHS network and the Greater Plains Collaborative to populate the PCOR-Net Common Data Model (CDM) from an i2b2 data warehouse
  - Refer to kumc-bmi/i2p-transform
- Manage monthly refresh of an i2b2 enterprise data warehouse (HERON)
  - Execute and troubleshoot HERON Extract, Transform, Load scripts that populate an i2b2 data warehouse from clinical data sources
    - \* ETL scripts are primarily written in SQL and are invoked using Python/Paver
    - \* Resulting i2b2 fact table contains over 2 billion rows
  - Data sources include Epic EMR, GE IDX Flowcast revenue cycle management system, North American Association of Central Cancer Registries, Social Security Death Master File, KU Biospecimen Repository, Vizient (formerly University HealthSystem Consortium), and KU REDCap databases. National ontologies based on UMLS and RxNorm
- Tune Oracle to achieve acceptable i2b2 query performance for end-users
- Develop SQL scripts and supporting Python code to load new fact types and enhance ontologies
  - Standardized medication ontology based on RxNorm
    - \* Refer to epic\_med\_mapping.sql (primary author)
  - Added support for searching patient medication information based on inpatient/outpatient order, dispense, historical, medication administration record (MAR) dose, and PRN flags
    - \* Refer to epic\_meds\_transform.sql (co-author - added features noted above).

- Modify ETL code as needed for changes implemented in the source data
- Maintain ETL code base with multiple contributors from KUMC and other institutions
- Participate in peer code review and design automated tests to help ensure quality code and accurate data representation
- Maintain SUSE and CentOS Linux servers utilized for production services such as Oracle databases, application and web servers
  - Configure new systems, apply security patches, install applications such as Trac, Apache http server, WildFly (JBoss), Jenkins continuous integration server, REDCap
  - Implement automated methods to manage log rotation, periodic backups, up-time monitoring, etc.
- Develop Docker container to implement i2b2 stack: WildFly, i2b2 cells/web client, Apache (docker\_i2b2\_wcapp) which is used for development and production environments.

## **Cerner Corporation - Kansas City, Missouri**

### **Technology Consultant Team Leader** January 2012 - March 2012

- Managed a team of 5 technology consultants specializing in IBM WebSphere application server and Cerner MillenniumMobile Framework (CareMobile/Handheld Specimen Collection)
- Responsibilities included mentoring new associates, direct client interaction to triage needs, commit team resources, and predict project effort

### **Senior Technology Consultant** February 2011 - January 2012

### **Technology Consultant** August 2010 - February 2011

- Role required 80% travel
- Worked independently to plan, coordinate, and execute on-site training and support engagements with over 40 clients all over the the United States
- Installed, trained clients, and provided technical support for:
  - IBM WebSphere application server and various WebSphere-based Cerner solutions
  - Progress Software SonicMQ (Cerner iBus) supporting Cerner RxStation and MDI/BMDI devices
  - Cerner MillenniumMobile Framework (CareMobile and Handheld Specimen Collection)
- Provided training, support, and custom scripting for SOTI MobiControl device management software
- Supported Honeywell and Motorola Windows Mobile-based hand held computers used for Cerner point-of-care solutions

## **Garmin International - Olathe, Kansas**

### **Software Engineering Team Leader** January 2008 - August 2010

- Managed eight software engineers who focused on integrating new, cutting-edge technologies
- Contributed Microsoft Windows-based tools written in C++ utilizing Microsoft Foundation Class library (MFC)
- Contributed automated testing and GPS performance analysis applications using Python and QT
- Major embedded technology focuses: NAND flash, SD/MMC flash devices, non-volatile memory management, and proprietary operating system development
- Major product contributions included the popular Nüvi series and many other handheld, Automotive, and OEM products
- Traveled around the world including Taiwan, India, and mainland China to support GPS sensor boards

### **Software Engineer** December 2002 - December 2007

- Maintained and developed GPS sensor products
- Developed mission-critical, high-integrity embedded non-volatile storage software modules that are used in nearly every consumer product produced by Garmin
- Developed embedded flash translation layer (FTL) software which facilitated the use of file systems and the mass-storage feature on automotive navigation products such as the popular Nüvi and C3 series
- Developed Microsoft Windows-based tools in C++ utilizing USB and RS232 communications for testing and diagnostics

- Traveled within the United States and internationally to Taiwan to support various projects and to meet with vendors to discuss new technologies

#### **Software Engineer Intern** May 2002 - August 2002

- Developed and maintained Microsoft Windows-based tools for testing and diagnostics
- Maintained and implemented improvements sensor products

#### **Boeing - St. Louis, Missouri**

#### **Software Engineer Intern** May 2001 - August 2001

- Designed and implemented Microsoft Windows-based software written in C++ to maintain precise temperature and pressure parameters to properly cure epoxy used to repair F-18 aircraft in the field

## **Education**

### **Missouri University of Science and Technology**

Graduated in December, 2002 **Cum Laude** with a **B.S. Computer Engineering**

## **Personal Projects**

- things2c: Motion Sensor/Video Capture System with Mobile Notifications and NFC Activation
  - Software/configuration is deployed with Ansible
- nathangraham.info: Static website hosted on Amazon S3
  - Source content is written in markdown/reStructuredText and contained entirely in version control
  - Rendered with Nikola
  - DockerFile builds an environment with the necessary dependencies to edit, build, test, and publish
  - Online résumé automatically converted to .pdf/.docx from markdown via build scripts

## **Other Experience**

### **Languages**

**Programming:** C, Python, SQL, C++, ARM assembly, R, Java, Perl, JavaScript **Markup:** HTML, XML, reStructuredText, markdown

### **Software/OSs/Platforms**

**Application Server:** WildFly (JBoss), IBM WebSphere application server **Integrated Development Environment:** Eclipse, Microsoft Visual Studio, GNU Emacs, PyCharm **Version Control:** Mercurial/Bitbucket, Borland StarTeam, git/GitHub, Subversion, CVS, TortoiseHg, SmartGit, SourceTree, GitKraken **Bug Tracking/Wiki:** Trac, Jira **Testing/Continuous Integration:** Jenkins, BullseyeCoverage **Microsoft:** Microsoft Visual C++, Office Suite **Operating system:** Microsoft Windows, GNU/Linux (Debian, Ubuntu, Linux Mint, CentOS, SUSE, slackware), OS X, FreeBSD, GarminOS **Platform:** Oracle VirtualBox, VMWare, Amazon Web Services (including EC2, S3, Route 53), bitnami deployments, Docker **Miscellaneous:** Apache Web Server, gcc, samba, OpenOffice, MatLab, RStudio, Secure Shell (SSH), rsync, GIMP, TrueCrypt, dm-crypt/cryptsetup, paver, Nikola Static Web Site Generator, Ansible, Airflow, rocket.chat, Raspberry Pi, RabbitMQ