

MICHAEL BOERNER

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CURRENT PROJECTS

CHRONIC WASTING DISEASE (CWD) PREDICTION, MODELING AND MAPPING -

Project to utilizing tools developed in Python to process and inspect images provided by volunteer land owners and hunters to compare images of confirmed CDW positive deer harvested and inspected at Fish and Game inspections stations, when leveraged with all other available data to help predict where CWD will either appear or increase to allow Fish and Game to predict where CWD will appear and how to better manage and reduce the impact of the disease. (**Sustainable Agriculture, Big Data, Machine Learning, NoSQL**)

DATA ACQUISITION UTILIZING DRONE TECHNOLOGY WITH SWARM METHODOLOGIES -

Creating autonomous inspection and data collection tools for remote data gathering. Several applications and under development, including crop and health and vigor data. The use of swarms of commodity priced drones improves data collection and efficiency while keeping costs low. This project involves **Big Data** and **NoSQL** solutions to store and process the large amounts of images captured.

TOP THREE FAVORITE PROJECTS

VIRTUAL LABORATORY SYSTEM (VLS) - (MONSANTO, PHARMACIA, PFIZER)

Integrated autonomous devices into a single virtual machine which gathered vast quantities of huge quantities of heterogeneous data including unstructured data (images of plants for example) using *metalogging* of images and profiles from various instruments. This system logged and integrated the life cycle of potential chemistry leads from acquisition to final disposition. NoSQL was early in development, *MySQL* was the initial database selected with *Oracle* as the production database. Languages used included Java, and C as well as proprietary scripting languages for specific instruments. The development cost was **\$500K** with an **single** instrument vendor offering **\$5M (ROI of 10:1)**. The initial concept involved using distributed Linux cluster with an early version of a distributed *MySQL* product, later version involved SGI/Cray Clusters and Oracle. (**Machine Learning, Big Data, Internet of Things, metalogging, unstructured data, eXtreme Programming (XP), Agile Programming**)

NUCLEAR REACTOR ACCIDENT MODE MODELING - (ARGONNE NATIONAL LAB, DOE)

Use of a Monte Carlo statistical modeling based around paths of individual neutrons which are followed from origin to destination of that neutron. The intent of this application suit was to model the principle accident models for nuclear reactors and other facilities using commodity priced computers, this was intended to allow individual facilities to model their conditions in real-time which was not possible previously. (**Monte Carlo methods, statistical modeling, prediction**)

DYNAMIC ATM LOCATOR TOOL - (MASTERCARD)

Provided real time availability and location of ATM's for customers, prior to real time GPS data availability. The system queried ATMs nearest the users location, providing information on availability, hours of operations, and services available. This required a constant query process which could not interfere with normal ATM operations. All data was stored to a dedicated Oracle database. The application required significant data cleaning and processing, as well as a level of dynamism that was new to the client. Introduced Java development to the clients site as it was a Perl shop which did not fit the needs of the client or customer. (**MySQL, Oracle, Linux, Unix, Java, statistical modeling, data cleaning, Agile**)

PROFESSIONAL WORK EXPERIENCE

UNDERHILL TECHNOLOGIES, LLC (www.underhilltech.com)

GENERAL CONSULTING • SOFTWARE/HARDWARE DEVELOPER • AUTHOR/REVIEWER 1996-PRESENT

- Conducting several inhouse research and development projects to address specific market needs utilizing publicly available data, the intent is to develop tools for organizations with limited resources which utilize the power and capability of advanced concepts like **Big Data, Machine Learning**, and **autonomous data gathering** tools, to support and assist in **Sustainable Agriculture** and **Sustainable Resource Management**.
- Provide diversified consulting services to clients, including guidance for hardware and software selection as well as installation and maintenance (**C/C++, Python, Java, SQL, NoSQL, Database**)
- Assist customer in identifying technology trends and determine how to leverage them. Assist customers in identifying inhouse resources such as their customer data, which can be better utilized. (**Big Data, Machine Learning, Data Analysis, Resource Management**)
- Custom Linux device driver development for embedded and non-embedded applications. (**C/C++, Unix, Linux, Embedded Systems, Agile, eXtreme Programming, Scrum**)
- Authored three books involving Linux Device Driver Cookbook, Embedded Linux Systems and Professional Linux Deployment, (see publication list for details). Technical reviewer/editor for O'Reilly and WROX Publishing on several diverse subjects including Java, SQL, Linux, and others.

SKILLS BASED ON CLIENTS AND PROJECTS

Not listed are projects which involve disclosure restrictions. Many with the same skills.

JAVA - MASTERCARD (ATM LOCATOR), MONSANTO (VLS), PFIZER - (HPLC AND VMR INTEGRATION)

C/C++ - ARGONNE NAT LAB, FERMI NAT LAB, LOS ALAMOS NAT LAB, MONSANTO, PFIZER, DEPT OF ENERGY

SQL - MOST CLIENTS INVOLVE SOME SQL WORK FOR EXAMPLE: MASTERCARD, MONSANTO, PFIZER

NoSQL - CURRENT PROJECTS LIKE CHRONIC WASTING DISEASE (CWD) PREDICTION, MODELING AND MAPPING, DATA ACQUISITION UTILIZING DRONE TECHNOLOGY WITH SWARM METHODOLOGIES

BIG DATA - MONSANTO, PFIZER, SEVERAL PROPRIETARY PROJECTS, CURRENT PROJECTS LIKE CWD PREDICTION, MODELING AND MAPPING AS WELL AS DATA ACQUISITION UTILIZING DRONE TECHNOLOGY WITH SWARM METHODOLOGIES

SELECT CLIENT LIST

AIMA NEUROLOGY, LLC - COMPLETE CONSULTING SERVICES FOR SMALL BUSINESS

ARGONNE NATIONAL LABORATORY - SOFTWARE ENGINEER

BLACK JACK LEATHER - COMPLETE CONSULTING SERVICES FOR SMALL BUSINESS

DEPARTMENT OF ENERGY - CONTRACT SOFTWARE ENGINEER, DATABASE ENGINEER

FERMI NATIONAL LABORATORY - CONTRACT SOFTWARE ENGINEER

GENCHEMICS, LLC - COMPLETE CONSULTING SERVICES FOR SMALL BUSINESS

GOCIO NEUROLOGY, LLC - COMPLETE CONSULTING SERVICES FOR SMALL BUSINESS

LOS ALAMOS NATIONAL LABORATORY - SOFTWARE ENGINEER

LOCKHEED MARTIN - SUBCONTRACTOR COMPUTER/SOFTWARE ENGINEER

MASTERCARD INTERNATIONAL - CONTRACT SOFTWARE ENGINEER

MONSANTO CORPORATION - SOFTWARE ARCHITECT, DATABASE ENGINEER, SOFTWARE ENGINEER

NATIONAL INSTITUTE OF SCIENCE AND TECHNOLOGY - SUBCONTRACTOR SOFTWARE ENGINEER

PFIZER CORPORATION - CONSULTING SOFTWARE ENGINEER

PHARMACIA CORPORATION - CONSULTING SOFTWARE ENGINEER

ZEROPLUS CORPORATION - SOFTWARE ARCHITECT, EMBEDDED SYSTEMS, DEVICE DRIVER DEVELOPER

CONTINUING EDUCATION

Continuing my training in Data Science specific disciplines including **Python, R, Linear Algebra, Multivariant Calculus, Statistical Modeling, Distributed Databases, Machine Learning, HADOOP, SQL/NoSQL, Big Data Methodologies, Scrum**, and other related topics. I have experience in all these areas previously, however, it is not documented directly through certification or other means. Working on Scrum, and Java certifications.

EDUCATION

Substantial graduate level study in Engineering, Computer Science and Computer Engineering
Several mini-courses, seminars, and accelerated courses on various CE/CS topics
MASTERS OF SCIENCE IN PHYSICS ▪ PURDUE UNIVERSITY ▪ West Lafayette, IN
BACHELORS OF SCIENCE IN PHYSICS ▪ IDAHO STATE UNIVERSITY ▪ Pocatello, ID

PUBLICATIONS

AUTHOR

Linux Device Driver Cookbook (In Preparation)

Focusing on specific examples rather than the more generic approach taken in other titles

Debugging Embedded Systems (In Preparation)

Focusing on tools for debugging embedded Linux systems, to be published in conjunction with Building Embedded Linux Systems and expanding on the discussion therein

Building Embedded Linux Systems 2nd Ed (O'Reilly Press - ISBN 0596529686)

Focusing on the tools and procedures required to build an embedded system based on Linux

Professional Linux Deployment (WROX Press - ISBN 1861002874)

Focusing on Linux for Enterprise support applications such as Oracle, Sybase, and Apache, as well as software development tools like MPI, PVM, and CORBA

TECHNICAL REVIEWER

Making Embedded Systems: Design Patterns for Great Software (O'Reilly, ISBN 1449302149)

Linux Kernel in a Nutshell (O'Reilly, ISBN 0596100795)

Linux Annoyances for Geeks (O'Reilly, ISBN 0596008015)

Understanding Linux Network Internals (O'Reilly, ISBN 0596002556)

Programming Embedded Systems (O'Reilly, ISBN 0596009836)

Professional Linux Programming (WROX Press ISBN 1861003013)

Professional JSP (WROX Press ISBN 1861003625)

Professional JSP 2nd Edition (WROX Press ISBN 1-861004-95-8)

Java Programmer's Reference (WROX Press ISBN 1861004222)

Professional Java Server Programming (WROX Press ISBN 1861002777)

Designing Distributed Applications (WROX Press ISBN 1861002270)

Professional JSP Site Design (WROX Press ISBN 1861005512)

Unattributed Reviews:

Linux Device Drivers 3rd Edition (O'Reilly, ISBN 0596005903)

Understanding The Linux Kernel 3rd Edition (O'Reilly, ISBN 0596005652)

LINUX JOURNAL ARTICLES

Product Review: Linksys WRV54G

Testing and Building with the New GumStix SBCs

GumStix WS200X

Beowulf Cluster Computing with Linux, 2nd Edition