

GRANT MATHEWS

<http://www.gmathews.com/projects.html>

<http://github.com/grantisu>

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Work Experience

Perfect World Entertainment – Fall 2011 to Present

Worked as a Data Engineer to design, develop, and deploy custom systems for internal customers.

- Led data team in implementing industry best practices, including: source control, code tests, staging environment, code review, and object orientation.
- Designed and implemented an object oriented data flow framework for efficient data processing and ETL. Emphasized modularity and clean abstraction, resulting in testable code and increased programmer productivity.
- Wrote Perl ORM modules for Cassandra, MySQL, Memcached, and Microsoft SQL Server to integrate external data sources with custom data flow framework.
- Designed and implemented schemas for CRM, business intelligence, and internal logging. Wrote and optimized queries for ETL, report generation, and internal tools.
- Worked closely with multiple teams to diagnose and fix problems in production environment, including: database optimization, Perl debugging, malware analysis, and systems configuration.

UC Davis Institute for Regenerative Cures – Fall 2010 to Fall 2011

Worked in a world-class research lab to design and develop data collection and analysis procedures and software for functional characterization of in-vitro cardiac tissue.

- Utilized SciPy and Matplotlib to create applications for display, analysis, and exploration of force transducer data; automated signal conditioning, feature detection, and statistical reporting.
- Wrote LabView applications to manage ADC configuration and operation; achieved efficient and reliable display and storage of ADC output at high sample rates.
- Utilized SciPy and ImageJ to analyze stem cell and cardiac tissue growth in digital microscope images.
- Assembled and operated a precision force transducer apparatus for measuring micro-Newton forces; analyzed and debugged signal conditioning, amplification, and power circuitry.
- Authored an academic paper presenting a method of automated analysis; contributed to and ran analysis for papers characterizing in-vitro tissue behavior.

Freelance Web Design – Spring 2009 to Summer 2010

Designed and implemented portfolio and small business websites using PHP and JavaScript.

- Used modular frameworks and created flexible code bases to meet customer's needs.
- Designed broadly compatible, responsive layouts to be functional on a large range of devices.
- Developed a simple and efficient image gallery using PHP.

Skills

Computer Languages – Perl, Python, C, shell (POSIX), SQL (MySQL, T-SQL), C++, JavaScript, PHP, BASIC, T_EX

Operating Systems – GNU/Linux (Gentoo, CentOS, others), Windows (XP, 7), Mac OS X, FreeBSD

Miscellaneous – Git, SSH, Syslog (syslog-ng, rsyslogd), LabVIEW

Personal Projects

Sericata Faucet – <http://doge.gmathews.com> – Python

Wrote a generic cryptocurrency faucet to dispense small payouts to whoever requests them. Utilized `gevent` and `Bottle` to efficiently perform JSON-RPC calls while staying responsive to HTTP requests and avoiding race conditions.

Game of Ice – <http://gameofice.gmathews.com> – C

Implemented a simple version of Conway's Game of Life, with a blue fading effect and entropy injected at the board edges. Uses `OpenMP` and `SDL`; has experimental `Emscripten` support.

Polysweeper – <http://polysweeper.gmathews.com> – Javascript

Wrote a Minesweeper clone to learn more about SVG and modern Javascript. Five different polygonal tilings are rendered via SVG, with a performance-conscious JS game engine.

String::Markov – <https://metacpan.org/pod/String::Markov> – Perl

Implemented a finite Markov chain module for Perl, and released it via CPAN. The module is based on the Moo object system, supports Unicode by design, and has 100% test coverage. The algorithm and data structures tuned to perform well on both servers and cell phones, for both loading and generating data.

Markov Server – <http://markov.gmathews.com> – Perl

Made a minimal web application to randomly generate several types of text. Explored PSGI, coroutines, Nginx reverse proxying, VPS management, and further refined `String::Markov`.

dwmstatus fork – <https://github.com/grantisu/dwmstatus> – C

Customized `dwmstatus` for personal needs. Refactored code for easy rebasing of multiple branches via `git`.

Education

University of California Davis

Bachelor of Science in Physics, December 2007

Publications

G Mathews, C Sondergaard, A Jeffreys, W Childs, BL Le, A Sahota, S Najibi, J Nolta, MS Si, "Computational analysis of contractility in engineered heart tissue," *IEEE Trans Biomed Eng* 59(5):1429-35 (2012); PMID 22361653

C Sondergaard, G Mathews, L Wang, A Jeffreys, A Sahota, M Wood, C Ripplinger, MS Si, "Contractile and electrophysiologic characterization of optimized self-organizing engineered heart tissue.," *Ann Thorac Surg* 94(4):1241-8; discussion 1249 (2012); PMID 22795054

C Sondergaard, R Witt, G Mathews, S Najibi, BL Le, T Clift, MS Si, "Prevascularization of self-organizing engineered heart tissue by human umbilical vein endothelial cells abrogates contractile performance," *Cell Tissue Res* 350(3):439-44 (2012); PMID 22955563