Tim Warnock

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Summary

Bitcoiner -- Developer -- Artist and Author

Specializing in Bitcoin (from advanced custody solutions to transaction processing and mining services), Software Engineering, API development, Machine Learning, Algorithm development and tuning, Data Warehousing and ETL, high-performance distributed applications, UI/UX, e-commerce, and financial analytics.

Technical expertise: Python, Kotlin, Scala, JavaScript, MySQL/MariaDB, Postgres, HTML/CSS, Java, C/C++, and more frameworks/tools than I can remember. I'm platform and language agnostic, although I prefer git and vim as development tools.

Experience

NYDIG

- remote (2021 to present)

- Lead Software Engineer, created the Bitcoin Data Team, and then the Mining Engineering Team, responsible for business critical projects with a focus on Bitcoin and large-scale data, leading to the world's first SOC-1 compliant mining pool and the launch of a one-of-a-kind solo mining initiative
- Founded the Bitcoin Book Club and study group, helping employees learn the fundamentals of Bitcoin -- including self custody, running a node, mining, as well economic and philosophical perspectives of Bitcoin as money
- Bitcoin Wallet Alerts -- serverless app monitoring activity on client addresses and alerting on any deposits and withdrawals
- Mining Pool payout and reconciliation pipelines -- full-pay-per-share (FPPS) payout and reconciliation processes
- Mining Pool SOC-1 pipelines -- out-of-band auditing pipelines independently reconciling all mining pool shares (billions of shares daily) with actual payouts, luck estimations, share rehash, and other auditing controls
- Bitcoin block alerts -- serverless app sending custom alerts for every block found by the NYDIG mining pool
- Hashrate Monitoring data pipelines -- collecting hashrate for NYDIG mining clients across all

relevant pools
- Solo Mining initiative -- proof of concept to hardened production solo mining operation (full nodes, stratum servers, block propagation strategies, stratum selector based on dynamic luck calculation)
- Designed and developed shared data pipeline and workflow orchestration system (using Argo Workflow, Karpenter, and EKS), able to scale from zero to to over 60k concurrent workers processing terabyte scale data -- this was first created as a bespoke solution for mining pool SOC-1 validations (including full re-hash of all valid mining pool shares)
- Tech stack: terraform, helm, argo-wf, AWS Lambda, ECS, EKS, RDS, python, C, Rust, Kotlin, Micronaut, Snowflake, Postgres, Docker

Capital One

- Cambridge, MA (2019 to 2021)

- Lead Software Engineer / Senior Manager for Capital One's treasury system, managing a ~100-billion USD investment portfolio. Greenfield project, front-end in React (Typescript) with API middleware in Scala and Zio (pure functional programming), containerized microservices running entirely in AWS
- Designed and developed a highly available database (with cross region replication) and real-time data processing for Capital One's treasury system (Python, Aurora-MySQL, AWS Lambda and SQS)
- Designed and developed SOX-compliant automated deployment system to manage the provisioning and configuration of AWS infrastructure (using Enterprise Github and Jenkins, with Python, Groovy and BASH scripting)
- Designed and developed fully-automated CI/CD pipeline, integrating Capital One's internal tools to enable fast and frequent releases (Docker containers deployed on-demand in a highly-available cross-region cluster using ECS, with integrations into Slack and Github)
- Led numerous proof-of-concept projects to explore new technology and influence a culture of continuous learning and experimentation (technical workshops, brown-bag sessions, etc)

Anatta Technologies (Founder)

- Global (2015 to 2019)

- Worked on various open-source and personal projects (see github.com/timwarnock)
- Designed and developed x404, a novelty URL-shortener (Python and Flask, with a JavaScript and HTML5 front-end) (formerly at http://去.cc, archived to x404.avant.net)
- Designed and developed flashcards.js, a machine-learning based language-learning tool (Python with JavaScript and HTML5 frontend, CSV to JSONP microservice layer in PHP, misc backend scripts in BASH)
- Designed and developed x-gallery for showcasing online artwork and photography portfolios (JavaScript and HTML5 frontend, JSON service layer in PHP, custom backend in ffmpeg, ImageMagick, and BASH)
- Lived in Taiwan (Taipei), and in Singapore -- studying Mandarin Chinese and traditional Chinese writing (書法). Previously lived in Colombia (Manizales), and in Mexico (San Miguel de Allende) -- studying Spanish and focusing on digital painting
- Created animated painting techniques mixing traditional painting styles (oil, acrylic, and watercolor) with digital techniques and custom software to create interactive animated paintings (BASH, ffmpeg, and JavaScript) (examples archived to studios.avant.net/art)

The New York Times

- New York, NY (2011 to 2015)

- Worked on the nytimes Recommendation Engine, a realtime system integrating both user reading behavior as well as article and video publication into a dynamic and responsive API to suggest articles to anonymous and registered users (front-end in Node.js, API middleware in Python, and backend in Java and DynamoDB). Supported algorithms include TFIDF and co-visitation
- Designed and implemented Multi-armed Bandit for the nytimes Recommendation Engine, utilizing machine learning techniques for optimal algorithm tuning (designed as a JSON-based API layer written in Javascript/Node.js) -- supporting AB, epsilon-greedy, and UCB1 decision algorithms
- Developed next generation recommendation algorithms using LDA and CTM (collaborative topic modeling), with a live testing framework (blind experiment and control groups), implemented in Python and C (and leveraging the MAB framework described above)
- Developed retention API (bringing experimental algorithm into production software), for automatic detection of at-risk subscribers (random forest technique over user behavior and reading activity; implemented in R and Python using elastic mapreduce) -- allows product developers and analysts to know the likelihood of an individual user canceling their subscription
- Designed and developed article dismissal system allowing users to dismiss suggested articles (full-stack development: backend recommendation engine, front-end in HTML5 and jQuery), available on nytimes.com/recommendations
- Architected, designed, and implemented financial analytics and reporting solutions for the digital subscription (paywall) project; development in Oracle (backend data warehouse), Python (data extraction layer), PHP (web API layer), HTML5 and Javascript (frontend)
- Designed and implemented financial analytic system to manage large data sets into separate (and auditable) reports for billing, revenue, forecasting, and taxation with cross report reconciliation per fiscal period; development in Python, Oracle and SQLite (for local per-node parsing of distributed data)
- Architected AR functionality into the core E-commerce system (spearheaded the collaboration with several departments: Technology, Finance, Customer Care, Marketing, Tax, Legal, etc.), ultimately a large undertaking to allow for subscriber grace periods, gift-certificates, customer care credits, and increased subscriber retention

Timothy J Warnock - Fine Art (Anatta Studios)

- Global (2009 to 2011)

- Founder / Artist
- Traveled to nearly 30 countries in southeast Asia and Oceania regions focusing on fine-art paintings, integrating photographic and technical expertise with traditional cultures and artistic techniques
- Over a dozen exhibits, ranging from fine-art photography to street art and installations -- exhibits are archived on timwarnock.com
- Designed and developed automated web-based workflow to manage high-res digital fine art; development in PHP, Python, and MySQL

Akamai Technologies, Inc

- San Diego, CA (2007 to 2009)

- Product Architect for the San Diego based Media Engineering team; designed and developed easy-to-use customer facing web applications with extensible and remotely accessible APIs (SOAP, AMF, and REST interfaces); development in Python, Django and Oracle (with integrations into Java web applications)
- Designed and implemented a high-performance multi-threaded metadata extraction tool (integrating with Akamai Edge servers); development in Python and MySQL; created custom Python DB API to dynamically delegate commands to read slaves and write master
- Previously worked as a Senior Engineer for the San Diego based Stream OS team responsible for streaming media and web-based applications. Akamai Stream OS helps top brands including the NBA, Universal Music Group, EMI Music, Adobe, Nike, and CBS Sportline to increase distribution and profit from their content
- Architected, designed and implemented a RESTful SOA for Stream OS Player Services allowing for custom media player integration over Akamai-delivered edge network; developed in PHP, MySQL, and ESI (Edge-Side Includes)
- Designed and implemented Akamai-based live-streaming flash solution integrated into StreamOS Live Events; development in PHP (GUI and remote APIs), MySQL, and Python (multi-threaded backend daemon)
- Managed the creation and adoption of Agile/Scrum development methodology and helped to migrate legacy software into appropriate SOX-controls

Qualcomm, Inc

- San Diego, CA (2006 to 2007)

- Development lead for MediaFLO IT which was responsible for all content and business systems surrounding the MediaFLO technology needed for commercial launch and operational sustainment
- Introduced Agile/Scrum development and project management methodology, growing the team from a single 4-person team to an organization with five Scrum teams (5-8 people each, over 30 people total); successfully established a Scrum-of-Scrums with executive directorate
- Established continuous integration and versioning of all artifacts (Maven 2, CruiseControl), including unit-test coverage of web, application, and database layers (versioned test data and db unit tests); incorporated Agile/Evolutionary data modeling techniques leveraging schema versioning and database schema change policies
- Architected and designed an end-to-end system for managing program guide metadata, importing guide data from content providers (e.g., Viacom) and populating Intranet, Extranets, and MediaFLO-enabled handsets
- Architected, designed and implemented a RESTful SOA for secure web applications supporting reusable data services and web content management tools; developed in JAVA, PL/SQL, XSLT, and Flex
- Architected account management tools supporting web-based single-sign-on (SSO) with role-based authorization across multiple domains of users (internal and external)
- Architected and designed MediaFLO data warehouse and ETL process definition for usage and subscription tracking including demographic surveys
- Established IT Architecture working groups focused on data and system integration,

build+release management, monitoring and alerting, identity and credential management, and SOX compliance
- Participated in the Change Control Board (CCB) and Executive Steering Committee for MediaFLO USA, Inc.

University of California, San Diego

- La Jolla, CA (2002 to 2006)

San Diego Supercomputer Center (SDSC)
- Senior Data Architect for the Network for Earthquake Engineering and Simulation (NEES); an NSF funded project building a geographically distributed data grid implementing advanced data models for long-term preservation and curation of earthquake engineering data and metadata
- Managed all data efforts for NEES leading a development team and serving as the architectural lead for web-based software and data services
- Managed the full life cycle of web-based application development, from the core database back-end (MySQL, Oracle, and SRB) to web front-end (HTML, XML, CSS, Javascript)
- Designed, developed and deployed NEEScentral (http://central.nees.org), a web-based application providing access to distributed resources in collaborative project areas; developed in Perl, PHP, MySQL with modularized data services in Java/J2EE, C, and Oracle
- Designed and developed web-based APIs, migrating from SOAP/WSDL to REST-based web services allowing for arbitrary applications and services to leverage back-end data grid resources over common web protocols (HTTP, TLS/SSL); deployed in Linux, Apache, MySQL, and PHP (LAMP) environment
- Deployed CVS source code repository and later migrated to Perforce
- Worked with senior management team to lead successful turnaround of IT efforts helping to secure NSF funding over a 10 year grant

Biomedical Informatics Research Network (BIRN)
- Principal developer and lead architect for grid portal infrastructure, a web-based application leveraging distributed data and computation grids allowing users to access the full resources of advanced grids through an intuitive web interface and remotely accessible web services; developed in Perl, Java, and MySQL; deployed on distributed Linux and Apache environment
- Designed and developed web-based GSI authentication system, including security API for both authentication and authorization services; developed in Perl and MySQL with APIs in Perl, Java, PHP, and SOAP/WSDL
- Designed and developed real-time diagnostic tools for the BIRN grid as well as a comprehensive performance monitoring suite (web-accessible); developed in Perl, PHP, and MySQL
- Developer on the Storage Resource Broker (SRB), a data grid middleware developed in C and deployed with an Oracle back-end; client APIs in C, Java, and Perl
- Successful deployment of web-based applications and services moved BIRN from the initial $30 million fund to over $100 million in NIH funding

Scripps Institution of Oceanography - CDIP
- Worked with the computer program management of the Ocean Engineering Research Group (OERG) real-time environmental data collection system
- Designed and implemented associated application software specializing in data collection and real-time diagnostics and monitoring; developed in Perl, PHP, Fortran, and MySQL; deployed in Solaris and Apache server environment
- Designed, implemented and deployed web-based applications for near-shore coastal measurements (e.g. http://cdip.ucsd.edu/offline/cdip/diagnostics/table.cdip)

Maricopa County Dept. of Telecommunications

- Phoenix, AZ (1999 to 2002)

- Managed enterprise class firewalls and proxy servers with 24/7 high availability and fault tolerance in homogenous cluster environments
- Developed scripts and auxiliary programs for rule-based parsing, queries and object administration as part of a mission-critical security scanning and enforcement program; developed in Perl and MySQL; deployed in FreeBSD and Apache server environment
- Designed and developed an active monitoring system to integrate server security audits with firewall rules to allow focused detection of attacks; developed in J2EE, PHP, and MySQL
- Designed and developed web-based applications for network statistics and usage summaries; developed in PHP and MySQL; deployed in FreeBSD and Apache server environment

Ikon Digital Litigation Service

- Scottsdale, AZ (1997 to 1999)

- Managed a team of four to five individuals responsible for the creation and data-entry of custom databases tailored to specific clients for litigation purposes
- Directly responsible for the indexing and recording of all materials; including highly confidential documents and all relevant material provided by the client
- MS Access and proprietary litigation database in a Windows NT Server and Netware environment

Education

Arizona State University - College of Engineering

- Awarded BS in Computer Science and Engineering (May 2002)
- Awarded a minor in Philosophy and a minor in Mathematics
- Completed 20 credit-hours towards Masters in Computational Mathematics
- Maintained a cumulative GPA over 3.7 while working full time

Co-curricular

- Member of IEEE, IEEE-CS, and Upsilon Pi Epsilon