KEVIN KAO

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EDUCATION

University of California, Berkeley – College of Engineering May 2016
B.S. Electrical Engineering & Computer Science (EECS) 3.63 – CS GPA

Awards: Regents & Chancellor Scholar
- Received by only top 2% of the university's students

Advanced Relevant Courses:
- CS61A: Structure and Interpretation of Computer Programs
- CS61B: Data Structures
- CS61C: Machine Structure & Computer Architecture
- CS70: Discrete Mathematics & Probability Theory
- CS176: Algorithms for Computational Biology
- STAT133: Concepts in Computing with Data
- CS161: Computer Security
- CS170: Efficient Algorithms & Intractable Problems
- CS186: Introduction to Database Systems
- CS188: Artificial Intelligence
- CS194-16: Introduction to Data Science
- INFO253: Web Architecture

SKILLS

Programming Languages: Java, Python, Ruby, C, C++, HTML, CSS, JavaScript, SQL, UNIX/Bash, JRuby
Frameworks: Sails.js, Ruby on Rails, Hadoop MapReduce, Python Flask
Platforms: Node.js, Redis, MySQL, MongoDB
Libraries: OpenMP, D3.js
Tools: Monit, Logstash, Kibana, Amazon EC2/S3, Amazon CloudFormation, nginx, Github, OpenSSL, RabbitMQ
Debuggers: irb, gdb, JUnit
Environments: Linux, Windows

WORK EXPERIENCE

AutoGrid Systems – Redwood Shores, CA May 2014 – Present
Software Engineering Intern / Full Stack Web Developer
Tech Stack: Ruby, Rails, Python, Monit, Redis, Java, UNIX, Apache Tomcat, HTML/CSS, JavaScript
- Intern who completed the most projects and closed the most JIRA issues – worked jointly with devops and engineering team
- Fully designed from scratch a Ruby gem serving as a communications platform that provides email, SMS, and voice functionalities
- Implemented a JRuby-based webservice and RESTful API for the Ruby gem for non-Ruby platforms to utilize its functionalities
- Integrated a Logstash/Kibana Ruby logger to provide organized, searchable logs with an UI for AutoGrid's Energy Data Platform
- Developed Python-based monitor service and API to check config and status of apps using Monit, UNIX, and socket programming
- Integrated a git information page to display information for each application about its commit version, branch, and log history
- Automated test jobs using Jenkins, allowing for Rspec tests to be continuously run on the latest versions of several projects
- Team project experience in an agile development setting, using Confluence, JIRA, and Github to efficiently carry out weekly sprints

UC Berkeley School of Information – Berkeley, CA February 2014 - Present
Full Stack Web Developer
Tech Stack: JavaScript, Python, Node.js, Sails.js, HTML/CSS, nginx, jQuery
- Fully developed secure Node.js web app moocRP for Berkeley researchers conduct data analytics and share D3 visualizations
- Followed MVC design pattern and used Node.js, Sails.js platforms develop both frontend UI and backend infrastructure
- Implemented security measures such as SSL, CSRF-prevention, and CAS authentication system
- Wrote data parsing Python and Bash scripts to contribute to Stanford's open-source scripts for ordering data into SQL/CSV files
- Implemented a self-update function in the script to pull latest versions from Github and currently adding multiprocessing for speed
- Implemented secure download pipeline for sensitive datasets with a system based on user permissions and admin checks
- Researching machine learning algorithms written in C++ with Matlab wrapper, possibly porting to Julia for parallelization
- Created RESTful API to automate JSON data retrieval from web application
- Developing modularized analytics to allow researchers to upload D3 visualizations and analytics code to be shared and run

UC Berkeley MOOCLab – Berkeley, CA October 2012 - Present
BerkeleyX Research Assistant
- Integrated LTI services to edX online learning platform, successfully importing Piazza to edX through XML tweaks
- Developed Amazon CloudFormation template for automating VM setup with appropriate dependencies,such as Ruby and Rails
- Currently working on performing item factor analysis with Khan Academy's Guacamole tool with a PhD student

Microsoft – Redmond, WA December 2012

Software Development Engineer for Test Extern

- Identified simple bugs from snippets of code through unit testing and integration testing
- Researched TDD with two externs to learn to push efficient code quickly in an agile software development cycle

UC Berkeley – Berkeley, CA October 2012 – October 2013

CS169 Undergraduate Teaching Assistant

- Assisted with the course "Software Engineering as a Service" under Professor Armando Fox and Dave Patterson

Paw for Paw – San Jose, CA July 2011 – July 2013

Co-Founder, Web Developer

- Started a web-based non-profit to help increase the number of dog adoptions at local animal shelters
- Spoke Humane Society representatives to discuss their needs and possible assistance
- Developed WordPress-based website with HTML, CSS, and PHP, with integrated, self-created wiki and gallery plugin

PROJECTS

moocRP (HTML, CSS, JavaScript, Node.js, Sails.js, Bootstrap, jQuery, nginx) June 2014 - Present

- See work experience section under "UC Berkeley School of Information"

Portfolio Website (HTML, CSS, JavaScript, Node.js, Sails.js, nginx) June 2014 - Present

- Developed front-end UI with parts of Foundation framework but mostly personal HTML/CSS modifications and implementations
- Wrote back-end in JavaScript with Node.js as the server and Sails.js for automatic routing, implementing a personal blog system

Node.js CAS Module (JavaScript, Node.js) April 2014 - Present

- Pioneered first open-source JavaScript CAS module specific to UC Berkeley's auth. system, packaging for Node.js package manager
- Researched numerous CAS clients in Java, Perl, PHP, and Ruby in order to determine module necessities

SimpleDB Relational Database (Java) January 2014 – May 2014

- Implemented tuple, page, and heapfile representations and iterators to efficiently traverse and search for records
- Implemented the buffer pool with a STEAL/NO-FORCE policy
- Designed the database with transactions to allow concurrency at a page level, with locking to prevent race conditions
- Wrote sort-merge algorithm that efficiently selects satisfying records in $O(n)$ time (input pages are sorted)
- Designed a query optimization algorithm based on dynamic programming that enumerated a close-to-optimal query plan
- Created histogram analytics to estimate the selectivity of predicates for use in the query optimization algorithm

Pacman Artificial Intelligence Agent (Python) February 2014 – April 2014

- Implemented uniform cost search, depth-first search, breadth-first search, greedy search , and A* graph search algorithms
- Developed smart Pacman that won 90% of games against adversarial ghosts using combination of graph search and mini-max trees
- Optimized for space and memory by using Bayes' Nets and feature weight representations to perform a search for optimal policy

Web, Linux VM Security Penetration Testing (Python, C, Ruby, Bash) March 2014 – April 2014

- Performed reconnaissance on Ubuntu VM using nmap and netcat network tools to find security holes
- Penetrated into five user accounts on Ubuntu VM remotely via vulnerable FTP service with GDB stack analysis
- Wrote Python and Bash scripts to pipe hex data and perform buffer overflows, bypassing ASLR defenses for root shell access
- Scanned vulnerable C code, writing a Python and Ruby script to bruteforce RSA private key and spoof DNS packets to bypass SSL

Image Metadata Parser (C, Python, machine binary) February 2014

- Implemented a secure image metadata parsing algorithm in C that quickly parsed through chunks of hex to grab metadata
- Used a combination of gdb and Valgrind to perform checks on memory leaks
- Wrote numerous security test cases in hex to test the parser against malicious JPG and PNG files
- Performed fuzz testing with several randomly generated JPG and PNG files to ensure security

Image Filter (C, OpenMP) November 2013

- Implemented fast image filter algorithm by means of convolution of a kernel matrix
- Utilized OpenMP library in C to exploit multi-threading for performance speed-ups of over 600%
- Exploited knowledge of Intel SSE intrinsics instructions and various compiler tricks to optimize program speed

MapReduce on Amazon EC2 (Java, Hadoop, Amazon EC2) September 2013

- Utilized the Hadoop framework to process large documents and calculate word relationships on Amazon's EC2 clusters
- Implemented efficient MapReduce algorithm through efficient selection and usage of data structures (Set, Hashtable, ArrayList)
- Benchmarked a speed of 51 seconds, less than half the time within the required two minutes (200% speedup)