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Jennifer M. Selby

Software engineer and teacher with a wide range of interests and experience looking to make a positive impact on society in a technically challenging position using my knowledge of machine learning, systems security, design thinking, and educational best practices.

Experience

The Nueva School, Computer Science Teacher *2013-2020* **San Mateo, CA**

Developed and taught computer science and design thinking classes for grades 3-12, including beginner classes taken by all students as well as advanced electives. Advised student groups including STEMinism, Programming Club, Outdoors Club. Mentored students in projects such as writing research papers, creating web and mobile apps, and performing data analyses. Assisted with FIRST Robotics team. Led workshops and trips centered on social justice issues.

Electives included:

Machine Learning Overview of full process including ethical concerns, data collection and cleaning, model selection, training, tuning, and validation. Survey of modeling techniques including linear regression, random forest, feed-forward/convolutional/recurrent neural networks, generative adversarial networks, and reinforcement learning. (Python, Scikit-Learn, Keras/Tensorflow)

Computer Security Survey of systems-level and code-level security issues. Topics included threat modeling, input sanitization, cryptographic tools, authorization concerns, and digital forensics. (Python, C, bash, SQL, JavaScript)

Computer Internals Overview of computational abstractions to allow students to build a CPU that implemented an assembly language they designed. Went from basics of transitors through logic gates to arithmetic logic units and registers to a full simulated CPU. (Logisim)

Functional Programming Comparison of the functional paradigm to iterative programming in terms of readability, maintainability, robustness, and efficiency. Topics included recursion, pure functions and side effects, currying, lazy evaluation, and asymptotic growth. (Scheme, Haskell)

Object-Oriented Programming Introduction to classes for organizing and reusing code. Topics included inheritance, composition, abstraction barriers, interfaces, abstract classes. (Python, Java, JavaScript)

Backend Web Development Topics included databases, asynchronous calls, templating, security, and performance. (JavaScript, HTML, Node, PostgreSQL, MongoDB, Handlebars)

App Development Introduction to programming through writing interactive apps. (App Inventor, JavaScript, React)

Girls Who Code, Lead Instructor *2013* **San Francisco, CA**

Taught an 8-week immersive summer programming survey course to 20 high school girls. Topics included programming abstractions (Scratch), robotics/AI (Python), graphics and animation (Processing.js, Adobe PhotoShop), web and UX design (HTML/CSS/JavaScript, jQuery), mobile design and entrepreneurship (jQueryMobile), and physical computing (Arduino C).

Nokia/HERE, Senior Software Engineer *2011-2013* **Berkeley, CA**

Improved statistical modeling for a map search engine in a combination of Python, Java, and R. Developed numerical optimization tools in C++.

pMDsoft, Software Developer *2010-2011* **San Francisco, CA**

Updated a Java Struts-based web application using AJAX (Prototype). Began porting a BlackBerry/iPhone application to the Android platform. Provided customer support.

Navia Systems, Software Engineer *2009 - 2010* **Berkeley, CA**

Implemented and tested Bayesian generative probabilistic models in a novel, Church-like programming language (Monty), with Python wrappings. Developed a django-backed web interface and cairo- and OpenGL-based visualization APIs for a prediction and multilevel clustering tool. Ran large-scale data analyses using Hadoop on Amazon Elastic Map Reduce EC2 machines with the Dumbo Python library.

Metacarta, Software Engineer *2004 - 2009* **Cambridge, MA**

Implemented, trained, validated, and improved Bayesian statistical models used in natural language processing, working primarily in C++ and Python. Maintained large PostgreSQL database of geographical information and training data. Developed command-line tools in Python, Perl, and bash for configuring and testing SSL, Active Directory, Samba, and Kerberos. Worked on systems for managing and securing document repositories.

Sun Microsystems, Software Engineer *2003 - 2004* **Burlington, MA**

Developed system management software for the Sun Fire family of servers. Designed, developed, and documented, extensible tools for embedded data storage. (C++, ksh)

MIT Information Systems, Junior Developer *2001 - 2003* **Cambridge, MA**

On Kerberos Development Team, updated and reorganized the user, system administrator, and installation guides, synchronizing the C code and documentation as necessary. Worked on automation tools in Tcl and Expect.

Volunteer   **StreetCode, Software Developer & Teaching Assistant** *2018-present* **Menlo Park, CA**

Developed a prototype React app for an entrepreneur participating in the accelerator program. Currently assisting in introductory programming classes for students of all ages.

Foster Parent Association, Technology Coordinator *2020-present* **San Mateo County, CA**

Responsible for setting up and maintaining mailing list and group area on county website. Developing automation for parent training session certificates.

YMCA Y Scholars, Tutor/Mentor *2005-2012* **Berkeley, CA**

Assisted high school students with homework, primarily in math and science.

MIT SIPB, Instructor *2003, 2004, & 2005* **Cambridge, MA**

Co-taught a two-week "Crash Course in C".

Education   **University of California, Berkeley** *2007-2009* **Berkeley, CA**
Independent of degree program

Coursework: Linear Algebra (MATH110), Intro to Probability and Statistics at an Advanced Level (STAT 202A & 200B) (R), Biostatistical Methods (STAT C245C) (R, Bioconductor)

Massachusetts Institute of Technology *1999-2003* **Cambridge, MA**
B.S. in Computer Science and Engineering

Selected Coursework: Operating System Engineering (C, i386 assembly), Network & Computer Security (various languages), Digital Systems Laboratory (VHDL), Microcomputer Project Laboratory (MCS assembly)