

Brooke Bullek

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Work Experience

SOFTWARE DEVELOPER (FRONT-END)

Bucknell University // Department of Chemical Engineering, June 2017 – Present

Designed and implemented a set of chemistry simulations addressing concepts in thermodynamics and heat transfer to replace traditional lab experiments.

Created original simulations ([1](#), [2](#)) for the web using JavaScript (vanilla & p5), HTML, CSS, and jQuery.

Updated pre-existing simulations to use Bootstrap templates & buttons for improved use on mobile devices.

STUDENT RESEARCH ASSISTANT

Bucknell University // Department of Computer Science, May 2016 – May 2017

Researched the intersection between data privacy and human-computer interaction, with particular emphasis on “usable privacy” and procedures that relay intuition about these systems.

Developed a technique for gauging users’ trust in mathematical protocols that protect confidentiality of large datasets (i.e. differential privacy).

Designed, implemented, and deployed an experiment on Amazon’s Mechanical Turk (AMT) using a custom platform with web integration built with jQuery, JavaScript, HTML, and CSS.

Parsed data gathered from participants and created statistical data visualizations using Python libraries such as Seaborn.

COMPUTER SCIENCE TEACHING ASSISTANT

Bucknell University // Department of Computer Science, January 2016 – May 2016

Led help sessions and tutored students individually or in small groups to reinforce computer science principles.

Discussed curriculum with a computer science faculty mentor in order to coordinate instructional efforts.

Graded weekly homework assignments and offered feedback for roughly 130 students.

CHIEF COPYEDITOR

Bucknell University // The Bucknellian, September 2014 – May 2017

Annotated copies of the weekly student newspaper of Bucknell University to indicate and correct errors in type, arrangement, grammar, punctuation, and spelling, following the conventions of AP style.

Crosschecked information submitted by journalists with figures presented by other sources to ensure publisher credibility.

Interviewed and hired copyeditors and oversaw their corrections before submitting final drafts.

Project Samples

AUDIO PROCESSOR

Researched the Java Sound API to perform various operations on audio files, including generating digital tones and exporting them as .wav files. Created a GUI to interface with the program and rendered the waveform visualization and Discrete Fourier Transform (DFT) of any .wav file. Project completion granted experience with algorithm optimization (to generate tones and render DFT visualizations in real time), I/O streams, byte manipulation (e.g. downsampling), and graphical user interfaces.

CUSTOM UNIX SHELL

Developed a set of tools in the C language for a command-line interface that merged pre-existing Bash functionality with original ideas, including support for a detailed history log and randomly generated

ASCII art. Later stages of development included collaboration with other students to combine functionality into a “gshell” (group shell) package. Project completion granted experience with Git repositories as well as the Bash and C languages.

TWITTER BOT

Bridged the Giphy and Twitter APIs to develop an autonomous Twitter account that posts a randomly selected “word of the day” and an accompanying GIF. Each word is assembled into a query to Giphy’s “trending” section and a callback function saves the media locally before uploading it to @Giph_Bot’s Twitter account. Project completion granted experience working with Heroku to deploy web apps that run independently, open-source Node.js packages, asynchronous programming, and Twitter’s OAuth implementation.

TWITTER TRENDS

Extracted and graphically represented aggregate national Twitter sentiment (positive, negative, or neutral) of keywords (e.g. “Barack Obama,” “student loans”) over a week-long period – 1 billion Tweets. Project completion gave insight into data mining with JSON objects and developing a GUI to present information to the user using the Python language.

Education

BUCKNELL UNIVERSITY, LEWISBURG, PA

B.S.E. // Computer Science & Engineering, May 2018

Activities & Societies

Association for Computing Machinery (ACM)
Bucknell Women in Science and Engineering (B-WISE)
Society of Women Engineers (SWE)
Collaborative Research Experiences for Undergraduates (CREU)
Computing Research Association (CRA)

Awards

CHI 2017 PAPERS AND NOTES: ACCEPTANCE

ACM SIGCHI || Denver, CO, May 2017

MOST OUTSTANDING ABSTRACT IN THE AREA OF NATURAL SCIENCES & ENGINEERING

Susquehanna Valley Undergraduate Research Symposium || Bloomsburg University, PA, July 2016

Additional Skills

Programming and markup languages: Python, Java, Bash, C, C++, HTML, CSS, JavaScript (+ p5, React, and Node frameworks), jQuery, Dart, Haskell, Prolog

Typesetting and other applications: LaTeX, Netbeans, Sublime, LibreOffice, Adobe CS6 (Illustrator, Flash, Fireworks, and Dreamweaver)

Miscellanea: Distributed version control systems (Git), Agile development methodologies (e.g. SCRUM), Unit testing (including doctest and JUnit)