Benjamin Berman

Location: moving to Pittsburgh, PA,
currently living in Stamford, CT

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http://github.com/bnjmnbrmn (http://github.com/bnjmnbrmn)

Overview

A software engineer with a **PhD** and **2+ years of experience in industry** who is interested in writing quality code, learning new skills and applications for those skills, and solving people's problems.

Qualifications

- Strong programming skills, especially in **Java**
  - Industry experience with Java EE + Oracle SQL and PL/SQL
  - Used Java in dissertation research
  - Experience with Formal Methods tools for development of correct software
- Experience in designing and developing new user interfaces, especially interfaces aimed at novice users of mathematical software
  - Graph visualization, zoom-able UIs
  - IDE plugin development, buffer manipulation
  - Asynchronous communication with backend
- Experience in designing, analyzing, and conducting tests of such interfaces with human participants
- Teaching experience:
  - Developed and taught, as sole instructor, an introductory Java course in the University of Iowa Department of Computer Science
  - Additional teaching experience with undergraduate and graduate students as a Computer Science teaching assistant at The University of Iowa, and with children grades 4-6 as a volunteer cello instructor in the Iowa City public schools

Education

- Ph.D. Computer Science, The University of Iowa, Iowa City, IA, December 2014
  - Dissertation Title: *Development And User Testing Of New User Interfaces For Mathematics And Programming Tools*
- B.S. Physics, Rice University, Houston, TX, May 2008

Work Experience

Interactive Brokers Group, Greenwich, CT

Secure Application Developer, *February 2015 to present.*
Primarily Java development, with some PL/SQL. Projects included (but were not limited to):
- File-based access to account management system
  - Processed XML files allowing $1,000,000,000+ clients to create batch requests for wire withdrawals, deposit notifications, position transfers, etc.; generated XML response files
  - Wrote XML schema specification files provided to clients
  - Created a web interface allowing users to
    - view the statuses of sorted and filtered instructions
    - upload and initiate processing of new files after providing 2nd factor credentials
  - Encrypted and signed files uploaded through the web interface
  - Refactored system to allow non-file instruction sources (e.g. SWIFT messages)
  - Designed and implemented fine-grained authorization system
- Second-factor authentication device mailing system

- Generated pdfs with names and addresses for mailing envelope window
  - Gathered user information from Oracle database
  - Included barcodes for mapping devices (with their own barcodes) to users
- Automatically activated devices after sending warning emails to device recipients
- Generated system reports (e.g. number of "Bingo card" devices upgraded to PIN pad display cards)
- Client for OCR web service (SOAP) for processing passport images
  - Decrypted image files uploaded by users
  - Sent image files to web service over https
  - Compared extracted text with database records

The University of Iowa, Iowa City, IA

Instructor, *spring semester, 2014.*
Introductory Java course for undergraduate and graduate students
- Developed new course material including programming projects, lesson plans, lectures, and exams
- Worked with students individually, in small groups, and as a class of 30

Research Assistant, *September, 2012, to September, 2014.*
User interfaces for the Coq Proof Assistant
- Collaborated in the planning and development phases of NSF award CCF-1250306
- Developed a basic UI for Coq as a plugin for the jEdit editor
- Developed experimental extensions to the basic UI
- Developed and executed user testing protocol

Research Assistant, *spring semester 2012*
- Developed a user interface for "KIND", a tool for automatically verifying properties of the programs written in the Lustre dataflow programming language
- Debugged connection with tool back end

Teaching Assistant, *fall semester 2008 through fall semester 2013*
- Nine semesters in the University of Iowa Computer Science Department
- Guided discussion sections for three different courses
- Graded and answered student questions for the graduate level "Formal Methods in Software Engineering" course for three semesters

Skills

- Java, various other languages (e.g. PL/SQL, JavaScript, C, Ruby)
- Java EE (Servlets, JSPs, EJBs, etc.)
- Piccolo Java library for zoom-able user interfaces
- jEdit plugin development
- Unix, Vim

- HTML, CSS, SQL
- Git, Subversion, CVS
- LaTeX, MS Excel (including Analysis ToolPak), Access, Word, PowerPoint, Mathematica, Google Docs, iMovie
- Coq, Alloy, Lustre, ESC/Java2, Dafny

Publications

Berman, B. A. and Hourcade, J. P (2014). Keyboard Card Menus: A New Presentation of Non-Standard Shortcuts. *Journal of Universal Computer Science, Special Issue on Trending Breakthroughs in Human-Computer Interaction.*

Berman, B. A. and Hourcade, J. P (2014). Keyboard Card Menus: Faster Learning of Many Fast Commands. In *Proceedings of the XIV International Congress of Human-Computer Interaction (Interaction 2013), in the Spanish Congress of Informatics (CEDI)*, pages 105-112, Spain, 2013. ISBN 978-84-695-8352-4.

Presentations

New Coq User Interfaces: Survey and Ideas. Presentation co-authored with Aaron Stump and Juan Pablo Hourcade. Presented at *The Coq Workshop 2012*, Princeton, NJ, USA, August 12, 2012.