# KARIM BENBOURENANE

SOFTWARE ENGINEER

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My lifelong passions belong to the fields of mathematics, science, and technology. I enjoy challenging problems that lie in the intersection of those fields. Over a decade of technical experience, I've developed creative and technical solutions to unsolved problems. I've worked on how to process and analyze large datasets; how to make tedious computing tasks easier for end users; and how to optimize existing software solutions with limited computing resources.

## </> SKILLS

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| **LANGUAGES** | PYTHON JAVASCRIPT RUBY JAVA GO C C++ BASH |
| **FRAMEWORKS** | DJANGO EXPRESS.JS BOOTSTRAP JQUERY RUBY ON RAILS SPRING FRAMEWORK |
| **WEB** | HTML XHTML XML CSS |
| **TOOLS** | PYCHARM GITLAB CI/CD CHROME DEVELOPMENT TOOLS |
| **NETWORKING** | DHCP DNS IPAM SNMP INFOBLOX CISCO SYSTEMS ARUBA NETWORKS F5 NETWORKS |
| **SYSTEMS** | DOCKER RED HAT ENTERPRISE LINUX VMWARE ESXI APACHE SERVER PUPPET PROJECT ATOMIC |
| **DATABASES** | MYSQL POSTGRESQL SQLITE NEO4J HIBERNATE ORM ORACLE MICROSOFT SQL SERVER |
| **SCIENTIFIC** | NUMPY SCIPY MATPLOTLIB MATLAB |

## 🏢 EMPLOYMENT

### *Software Engineer*, Carnegie Mellon University
2012-04 — Present

Designed and wrote software that provides support to the University's network infrastructure (e.g., routers, switches, and wireless access points) as well as network services (e.g., DHCP, DNS, and IP address management).

- Designed and implemented a web application for user self-service to register devices on campus wired and wireless networks. Users can register a device with minimal interactions by automating and predicting the network to which the user belongs.
- Maintained and updated an application that reports firewall rules. The application logs into those firewalls, collects the running configuration, processes it into a user-friendly format, and reports it to users based on their search queries.
- Wrote a set of SNMP Ruby libraries to query network devices for diagnostic and identity information.
- Implemented a new and adaptive inventory system for tracking network devices.
- Wrote a Python library for making SOAP calls to a 3rd party wireless policy manager to collect information on connected users for historical and legal purposes.
- Created a web application for registering users on the campus guest wireless network.
- Implemented a network crawling library that generates a layer 3 topology map of wired networking devices on campus.
- Wrote a Python library for consuming the InfoBlox DDI web API in an object-oriented way.

### *Graduate Research Fellow*, University of Pittsburgh
2008-08 — 2011-05

Conducted research in computational biology in an interdisciplinary program that focused on computational methods to solve previously intractable biological problems.

- Completed work towards solving a problem in immunology; specifically, adapting a computational physical model of cytotoxic T cell morphology.
- Simulated how the T cell changes its shape and orientation under the influence of anticancer agents using only physical forces and dynamics.
- Used mathematical computation techniques to solve a constrained optimization problem to produce minimal energy cell morphologies.

### *Software Developer*, Horizon Mud Company

Built a web application to help the sales team develop strong, long lasting vendor-customer relationships.

- Built a Ruby on Rails app to create and modify web-accessible expense reports for customers.
- Reduced managerial burden through automation, eliminating thousands of man-hours per year in administrative expenses.

### *Residential Network Consultant*, University of Pittsburgh

2006-08 — 2008-04

Assisted students with technical issues and helped diagnose and fix problems with their computer, smartphones, and gaming consoles.

- Removed viruses and spyware.
- Performed backup services and reinstalled operating systems.
- Diagnosed and fixed network connectivity issues.

### *Software Developer*, Field Expert

2006-09 — 2008-03

Worked with a startup company that focused on software consulting and training.

- Developed a Java EE application to solve problems in inventory logistics.
- Wrote modules to give customers access to manipulate supply inventory data stored in MSSQL through a user-friendly web interface.
- Created training tutorials to teach students how to install and use course applications.
- Composed introductory materials for students learning to write application code with our course technologies.

### *Web Master*, University of Pittsburgh

2006-11 — 2008-02

Managed and updated the website of the Civil & Environmental Engineering Department.

- Maintained the department website on a daily to weekly basis by updating course descriptions.
- Posted department news, faculty generated content, and advertisements for open faculty positions by editing static HTML and CSS.
- Designed a solution to fix accumulated errors in the often reused HTML template used across the department site.

### *Intern*, United States Steel Corporation

2006-01 — 2006-09

Learned software development skills by writing enterprise applications that contributed to the corporate mission.

- Wrote a Java application to handle steel inventory tracking.
- Built a data migration tool to assist in transitioning a legacy database to an Oracle database.
- Used my data migration tool to help team members find missing inventory.

# EDUCATION

## University of Pittsburgh

2004-08 — 2008-04

# SERVICE

### *Undergraduate Research Assistant*, University of Pittsburgh

2007-02 — 2008-06

Trained as a practicing scientist in the David J. Earl Group at Pitt. I wrote code to produce genomic simulations and utilized my expertise in the statistical sciences to analyze the results and draw some new conclusions.

- Wrote a genetic reproduction simulation in C and C++ to explore a problem in metagenetics.
- Gained new insights to the question: Do traits that affect hereditary processes (like mutation rates) spontaneously emerge and regulate their own expression as an evolutionary process?