Derrick Kearney

CONTACT INFORMATION

IT@P Research Computing
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INTERESTS

Experienced in community oriented, open source, scientific software library and toolkit development. A quick learner interested in leveraging new technologies to create software that impacts mobile and multicore platforms at the operating system and ecosystem levels, while evangelizing about the benefits of testing, automation, and open source technologies.

EDUCATION

Purdue University, West Lafayette, IN

M.S., Electrical and Computer Engineering **May 2015**

- Thesis Topic: Automated testing in multimodal systems
- Advisor: Professor Samuel P. Midkiff
- Area of Study: Computer Engineering / Software Systems

B.S., Computer Engineering **Dec 2003**

- Emphasis on software systems
- Minor in Psychology

PROFESSIONAL EXPERIENCE

Purdue University, West Lafayette, IN

Software Engineer **February 2005 to present**

HUBzero Platform for Scientific Collaboration
https://hubzero.org

Developer and primary simulation tools contact for HUBzero®, https://hubzero.org, an open source platform for creating dynamic, production quality websites that support scientific research and educational activities with over 400,000 registered users and over a million visitors per year.

- **Engaged users and open source community members** to help increase adoption of both the HUBzero Platform and Rappture Toolkit, implement new features, develop automated testing strategies, and fix bugs. Resolved over 400 community interactions in our internal support ticket system.
- **Designed language bindings and several core Tcl/Tk widgets** for the Rappture Toolkit, an open source software library designed to help scientists rapidly assemble and deploy graphical user interfaces for their simulation codes. Responsibilities included writing and maintaining language bindings for C, C++, FORTRAN, MATLAB, Octave, Perl, Python, and R.
  http://rappture.org

- **Collaborated with dozens of research groups** affiliated with the Network for Computational Nanotechnology, Purdue, UIUC, UCSD, Vanderbilt, Southern Illinois, UC Merced, NIH, and other institutions around the world to build freely available, scientific applications including:

  SolarPV

  Simulates electricity demand in residential communities with solar photovoltaic (PV) systems. Worked with a Chemical Engineering team to adapt a proprietary model to run on the HUBzero Platform, where students could easily create, upload, and simulate using their own data.
  Coded in Java, MySQL, Python, Bash
  https://nanohub.org/resources/solarpv doi:10.4231/D3BV79W4T

  ParticleVE

  Track and estimate particle velocities using video from the 2010 Deepwater Horizon oil spill in the Gulf of Mexico. Worked with a microfluidics and particle image velocimetry expert to build an open source application which uses video from the oil spill and algebra to assist users in estimating the amount of oil released into the Gulf after the drilling rig explosion.
  Coded in Tcl/Tk, C (libav/ffmpeg), HTML
  https://nanohub.org/resources/particleve doi:10.4231/D35D8NF30

  NanoFET

  Simulates the effects of downscaling conventional CMOS devices, uncovering the challenges of working on the ever-shrinking nanoelectronics in devices. Worked with a small team of Electrical Engineering postdocs to parallelize the code using MPI, configure it to run on TeraGrid supercomputers, and deploy it on nanoHUB.org as a publicly available community software tool.
  Coded in FORTRAN
  https://nanohub.org/resources/nanofet doi:10.4231/D3X921K5T

- **Created HUBcheck, an open source Python library** used to build automation scripts and user level tests for HUBzero based websites and simulation tool environments. Built on top of Selenium WebDriver and Firefox to provide web browser automation, Paramiko to provide SSH automation, BrowserMob Proxy, FFmpeg, VNC, and X server utilities. With HUBcheck, developers can simulate a user's website experience through abstractions of HUB web pages and interact with the HUB's virtualized, Debian GNU/Linux based simulation tool environment, all from a single script.
  https://github.com/codedsk/hubcheck

- **Cultivated next generation researchers through mentorship and teaching** of students participating in Purdue University's Summer Undergraduate Research Fellowship (SURF) program. Organized workshops, held open office hours, and worked with other faculty and staff to introduce students to nanotechnology research, software development best practices, the HUBzero Platform, and Rappture Toolkit.
  http://www.purdue.edu/surf

Convergys Corporation, Cincinnati, OH

Associate Programmer / Analyst	**January 2004 to January 2005**
Intern	**May 2003 to August 2003**
Intern	**December 2002 to January 2003**
Intern	**May 2002 to August 2002**

- Provided application support for Mediation Manager, the company's flagship mobile phone billing and rating software.
- Custom software design and development for Verizon Wireless including on-site consultation regarding system setup, testing, and operation.
- Provided production support for Cincinnati Bell Wireless.

REFEREED JOURNAL PUBLICATIONS

[1] McLennan, M., Clark, S., Deelman, E., Rynge, M., Vahi, K., McKenna, F., Kearney, D., Song, C. (2015). HUBzero and Pegasus: integrating scientific workflows into science gateways. Concurrency and Computation: Practice and Experience, 27(2), 328-343. doi:10.1002/cpe.3257

[2] Ahmed, S., Klimeck, G., Kearney, D., McLennan, M., & Anantram, M. P. (2007). Quantum Simulations of Dual Gate MOSFET Devices: Building and Deploying Community Nanotechnology Software Tools on nanoHUB.org. International Journal of High Speed Electronics and Systems, 17(03), 485-494. doi:10.1142/S0129156407004679

CONFERENCE PROCEEDINGS

[3] GL Rochon, Carol Xiaohui Song, Lan Zhao, Dev Niyogi, Derrick S. Kearney and Jie Shan. "Supporting Interdisciplinary e-Science through Real-Time Remote Sensing & High Performance Computing in a High Bandwidth Environment," 20th International CODATA Conference. Scientific Data and Knowledge within the Information Society. Oct. 23-25, 2006, Beijing, China.

[4] GL Rochon, J. Paul Robinson, Carol Xiaohui Song, Lan Zhao, Dev Niyogi and Derrick S. Kearney. "Remote and Proximal Sensing in Support of Disaster Mitigation and Sustainable Development," Chinese Academy of Sciences, China Remote Sensing Ground Station (RSGS), Beijing, China, Oct. 24, 2006.

[5] GL Rochon, Mohamed A. Mohamed, Dev Niyogi, Melba M. Crawford, J. Paul Robinson, Souleymane Fall, Joseph E. Quansah, Larry Biehl, Jie Shan, Carol Xiaohui Song, Derrick S. Kearney, Lan Zhao and Amy Neuenschwander. "Integration of Real-Time and Archival Remote Sensing with High Performance Computing & Dynamic Modeling to Support Disaster Mitigation." African Association for Remote Sensing of Environment (AARSE), Cairo, Egypt, Oct. 30 - Nov. 2, 2006.

[6] GL Rochon, Mohamed A. Mohamed, Dev Niyogi, Melba M. Crawford, J. Paul Robinson, Souleymane Fall, Joseph E. Quansah, Larry Biehl, Jie Shan, Carol Xiaohui Song, Derrick S. Kearney, Lan Zhao and Amy Neuenschwander. 'In Situ Monitoring, Satellite Remote Sensing, Proximal Sensing & High Performance Computing to Facilitate Sustainability and Disaster Preparedness." Cairo University, Aerospace Studies Department, Cairo, Egypt, Nov. 2, 2006.

[7] GL Rochon, Mohamed A. Mohamed, Dev Niyogi, Melba M. Crawford, J. Paul Robinson, Souleymane Fall, Joseph E. Quansah, Larry Biehl, Jie Shan, Carol Xiaohui Song, Derrick S. Kearney, Lan Zhao and Amy Neuenschwander. "Multidisciplinary Research Enabled by Real-time and Archival Remote Sensing and High Performance Computing to Support Environmental Sustainability and Disaster Mitigation." Al Ahzar University, Departments of Astronomy and Meteorology, Cairo, Egypt, Nov. 4, 2006.

CONFERENCE TALKS

[8] Kearney, D. Supercharge your simulation tools with nanoHUB.org. Nanoindentation 2015, Urbana, Illinois, April 1–2, 2015. https://nanohub.org/groups/nanobio/nano_agenda_april_2015

[9] Kearney, D. Design Patterns beyond the Page Object: An investigation into the design patterns used while building page objects. Selenium Conf '14, Bangalore, India, September 4–6, 2014.
https://www.youtube.com/watch?v=AVrnBJDQeaI

[10] Kearney, D. HUBcheck - Check the Hub. HUBbub 2011, Indianapolis, Indiana, April 07–08, 2011.
https://hubzero.org/resources/422

Workshops and Teaching Experience

[11] Kearney, D. Rappture Toolkit, Submit for Job Submission, and PUQ for Uncertainty Quantification. HUBbub 2015, Indianapolis, Indiana, September 13–16, 2015.
https://hubzero.org/hubbub/2015/

[12] Kearney, D. Introduction to Workspaces and Simulation Tool Development on nanoHUB.org. nanoHUB User Conference 2015, West Lafayette, Indiana, August 31–September 1, 2015.
https://nanohub.org/groups/conference

[13] Kearney, D. Software Bootcamp. NCN Software Bootcamp 2015, West Lafayette, Indiana, June 1–3, 2015.

[14] Kearney, D. Introduction to the Rappture Toolkit. HUBbub 2014, Indianapolis, Indiana, September 28–October 1, 2014.
https://hubzero.org/resources/1216

[15] Kearney, D. Software Bootcamp. NCN Software Bootcamp (UC Merced Edition), Merced, California, July 14–18, 2014.

Service

Caribbean Student Association (CARIBSA), Purdue University

Advisor **August 2005 to Present**

Guide students through the acquisition of grants and resources to further the club's mission of educating the community about the people, culture, and contributions of islands and nations in the Caribbean region.

Recent club activities include:

- One Love: Caribbean & Beyond **Feb 2016**
- Homecoming Parade **Nov 2015**
- Lafayette Transitional Housing Center Dinner **Fall 2010**
- Help For Haiti Earthquake Relief Fundraisers **Spring 2010**
- Lyn Treece Boys and Girls Club Carnival **Spring 2007**
- Hanna Community Center Homework Assistance Program **Fall 2007**
- Hanna Community Center Carnival **Fall 2006**

http://bit.ly/caribsa
http://bit.ly/caribsa-facebook

Lafayette Transitional Housing Center

Volunteer Chef **November 2012 to April 2015**

- Connected with members of our community who are housing insecure, providing two things often missing from their lives, healthy home cooked meals and good conversation.
- Developed menus, sourced food, and cooked unique dinners for up to 60 clients each month.

Boy Scout Troop 336, West Lafayette, Indiana

Committee Chair **February 2012 to December 2013**

- Helped launch and charter a new troop, assisting one scout to reach the rank of Eagle Scout and nearly all other scouts to reach the rank of First Class.
- Built a team, from parents and members of the Purdue University College of Technology, to provide enrichment for the troop through grant funded activities that supported scout rank advancement.
- Conducted monthly information sessions and collaborated with parents to support the external needs of the troop like transportation to out of town destinations, camping permits, and equipment acquisition.
- Worked with scouts to implement a leadership team responsible for organizing trip meals, managing troop equipment after trips, teaching incoming scouts new skills, and upholding Scouting virtues.

Minority Engineering Program (MEP), Purdue University

Summer Programs Volunteer **February 2005 to August 2008**

- Organized lab tours of Birck Nanotechnology and Bindley Bioscience Centers on Purdue University's West Lafayette campus.
- Coordinated with the Network for Computational Nanotechnology and Discovery Park to produce the initial Birck Nanotechnology Center atrium exhibit, showing how nanotechnology improves our lives from the clothes we wear to the materials and devices we use every day.
- Developed and taught Top Down vs. Bottom Up: Intro to Photolithography, a nanotechnology based shortcourse to supplement the experience of 6^{th}–10^{th} grade MEP summer program students.

AWARDS

- Motorola/Purdue Electrical and Computer Engineering Scholarship, 2003
- Minority Engineering Excellence Scholarship, 2002
- General Motors Academic Excellence Scholarship, 2001
- Lockheed-Martin Academic Excellence Scholarship, 2000
- Purdue University Black Caucus Award, 2000
- Eagle Scout, 1998

SKILLS

Experienced:
C, C++, Python, Tcl/Tk, UNIX shell, GNU Tools (Autotools, configure, Make, gdb, GNU compilers and friends), Subversion, Debian GNU/Linux

Practiced:
FORTRAN, Perl, MATLAB, Octave, R, Git

Basic/Exploring:
Rust, HTML, CSS

Formerly Used:
SQL, Java

MORE INFORMATION

Auxiliary documents and references available upon request.