Derrick Kearney

CONTACT INFORMATION

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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 desktop, mobile, and multicore platforms at the operating system and ecosystem levels, while evangelizing about the benefits of testing, automation, and open source technologies.

CONTRIBUTIONS

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 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/dskard/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

PROFESSIONAL HISTORY

Software Engineer, Purdue University **2005 - Present**
Developer for HUBzero Platform for Scientific Collaboration

Associate Programmer, Convergys Corporation **2004 - 2005**
Developer for Mediation Manager, mobile phone billing and rating software.

EDUCATION

Purdue University
Master of Science (MS), Electrical and Computer Engineering **May 2015**
Thesis Topic: Automated testing in multimodal systems

Purdue University
Bachelor or Science (BS), Computer Engineering **Dec 2003**
Emphasis on software systems

PUBLICATIONS, PROCEEDINGS, TALKS

- **Co-authored 7 refereed journal publications and conference proceedings** with topics ranging from building web-based scientific workflows to Remote Sensing tools and applications.
  http://bit.ly/dk-pub-2014-1 doi:10.1002/cpe.3257
- **Presented at 3 conferences** about design patterns for Selenium WebDriver based automated website testing and deploying scientific simulation codes on the web.
  https://www.youtube.com/watch?v=AVrnBJDQeaI
- **Led 7 interactive workshops**, with lectures and assignments, teaching software best practices and methods for building and deploying scientific simulation tools on the HUBzero Platform.
  https://nanohub.org/courses/tools/bootcamp2017

SERVICE

Purdue Caribbean Students Association, Advisor **2005 - Present**
Greater Lafayette Open Source Symposium/PurduePM, Presenter **2007 - Present**
Lafayette Transitional Housing Center, Volunteer Chef **2012 - 2015**
Boy Scout Troop 336, West Lafayette, IN, Committee Chair **2012 - 2013**
Purdue Minority Engineering Program, Summer Programs Volunteer **2005 - 2008**

AWARDS

Eagle Scout

MORE INFORMATION

Learn more at **http://bit.ly/dk-cv**.