Dane Powell

Lead Developer

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 Dane Powell

Note that some parts of this document (e.g. GPA and sensitive contact information) have been redacted for web publication

Vocational Experience

2013– **Lead Developer**, *Trellon*, Houston, TX (remote), 40 hrs/wk.
- Worked directly with clients and an international team of developers to build Drupal websites and modules for Jane Goodall Institute, Gates Foundation, Stanford, NRG Park, and Leaping Bunny.
- Experience with all parts of the site and module design and management process, including solutions architecture, project management, infrastructure management, and backend development.
- Developed a Docker-based continuous integration and development infrastructure to increase test coverage and drastically reduce onboarding time for new developers.

2012–2013 **Consulting Developer and Engineer**, *LilyPad Development*, Houston, TX, 10 hrs/wk.
- Built infrastructure to support sites with 30,000 unique visitors and 200GB of daily traffic using continuous integration on Rackspace Cloud servers, Aegir hosting system, Drush Make, and Jenkins.
- Built, audited, and maintained sites and provided on-site training for dozens of clients using CiviCRM, Open Atrium, and standard Drupal distributions.

2008–2013 **Freelance Drupal Developer and Engineer**, 10 hrs/wk.
- Built websites for IEEE Haptics Symposium, Rice University, and other clients on dedicated Linux servers, AWS, Pantheon, Acquia, and Drupal Gardens.
- Developed modules and workflows for integrated mailing list / notifications systems for Praece Consulting and Marine Affairs Research and Education.

2007–2013 **Teaching Assistant**, *Rice University*, Houston, TX.
- Instructed, organized, and graded 10 upper-level engineering courses (each up to 140 students).
- Attended voluntary classes and workshops on teaching methods for science and engineering.

2007 (4m) **Engineering Consultant**, *Nimbic Systems*, Houston, TX, 40 hrs/wk.
- Developed a patent-pending surgical site isolation device using Autodesk Inventor and CFD.
- Designed and executed a research study into operating room air quality.

2004–2006 **Banker, CSR, Sales Specialist**, *REI (Recreational Equipment, Inc)*, Austin, TX.

2005–2006 **Campus Computing Associate**, *Rice University*, Houston, TX, 10 hrs/wk.
- Provided technical support to 300 students and staff.
- Maintained network and dozens of college-owned computers.

2003 **Database Developer**, *Susan G Komen Race for the Cure*, Houston, TX.

2001,2003 **Intern**, *Zebra Imaging*, Austin, TX.
- Designed, built, and tested lighting systems used to create short, full-motion holographic videos.

Education

2013 **Ph.D. Candidate**, *Rice University*, Houston, TX, — *GPA*.
Mechatronics and Haptic Interfaces Lab. Focus in model-mediated teleoperation.

2011 **Visiting Researcher**, *University of British Columbia*, Vancouver, BC.
Sensory Perception and Interaction Research Group. Focus in embedded hardware prototyping.

2010 **M.S. Mechanical Engineering**, *Rice University*, Houston, TX, — *GPA*.
Mechatronics and Haptic Interfaces Lab. Focus in robot-mediated training.

2008 **B.S. Mechanical Engineering**, *Rice University*, Houston, TX, — *GPA*.
Focus in robotics, system dynamics and control. President's Honor Roll.

2006 **Study abroad**, *Queen Mary, University of London*, London, UK, — *GPA*.
Focus in engineering and linguistics.

Skills

Haptics, mechatronics
- Design mechatronic systems (control software, hardware, interfaces).
- Construct and evaluate physical and virtual prototypes (laser cutting, 3D printing, CAD/CFD).
- Integrate multiple disparate systems to create unified interfaces.
- Design for maximum usability and considering human factors.

Drupal development
- Build web sites using Drupal 6/7/8.
- Implement and maintain high-reliability sites using best practice devops (git, Jenkins, functional testing, Drush Make, Aegir, Features)
- Scale large websites using dedicated or virtual infrastructure (Varnish, Squid, Memcached, CDN)
- Build complex modules using best practices and coding standards (functional testing, documentation).

Leadership, communication
- Lead, coordinate, and instruct large groups of people.
- Mentor and advise small groups and individuals.
- Communicate results effectively, simplifying complex issues.
- Write grants and obtain funding.

Science, statistics
- Design and execute user studies.
- Analyze data using statistical methods and software (SPSS, SAS).
- Summarize results in clear and concise publications and reports.

Publications

Dane Powell and Marcia K. O'Malley. The task-dependent efficacy of shared-control haptic guidance paradigms. *IEEE Transactions on Haptics*, 5(3):208 –219, 2012.

Dane Powell and Marcia K. O'Malley. Efficacy of shared-control guidance paradigms for robot-mediated training. In *IEEE World Haptics Conference*, Istanbul, Turkey, 2011.

Dane Powell. Implementation and analysis of shared-control guidance paradigms for improved robot-mediated training. Master's, Rice University, Houston, 2010.

Dane Powell and Marcia K. O'Malley. Co-presentation of force cues for skill transfer via shared-control systems. In *16th Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems (HAPTICS)*, 2010.

Ozkan Celik, Dane Powell, and Marcia K. O'Malley. Impact of visual error augmentation methods on task performance and motor adaptation. In *IEEE 11th International Conference on Rehabilitation Robotics (ICORR 2009)*, pages 793–798, 2009.

Angela Yun Zhu, Jun Inoue, Marisa Peralta, Walid Taha, Marcia K. O'Malley, and Dane Powell. Implementing haptic feedback environments from high-level descriptions. In *International Conference on Embedded Software and Systems (ICESS 2009)*, 2009.

Portfolios

GitHub	github.com/danepowell
Drupal Contributions	drupal.org/user/339326
Drupal Features	code.danepowell.com

Research Experience

2011–2013 **Human-in-the-Loop Control of a Bipedal Robot with Variable Levels of Autonomy**, *Marcia O'Malley / Reginald Berka*, Rice University / Johnson Space Center, Houston, TX.
- Developed haptic teleoperation interface for NASA's Robonaut 2, DARPA Robotic Competition.
- Developed embedded hardware integrating tactile sensing array and ROS using C++, Python.
- Proposed, wrote, and received NASA Space Technology Research Fellowship ($200,000 over 3 years).
- Proposed and wrote Enriching Rice through Information Technology grant ($50,000 over 2 years).

2011 (6m) **Improved Touch-Sensing for the Haptic Creature**, *Karon MacLean*, University of British Columbia, Vancouver, BC.
- Developed and analyzed novel touch-sensing suite based on quantum tunneling composites.

2008–2010 **M.S. Thesis: Implementation and Analysis of Shared-control Guidance Paradigms for Improved Robot-mediated Training**, *Marcia O'Malley*, Rice University, Houston, TX.
- Developed new guidance paradigms for haptic interfaces using C++, H3D.
- Designed and executed 60-person efficacy study using Matlab, SPSS, and SAS.
- Published, presented in Transactions on Haptics, World Haptics Conference, Haptics Symposium.

2009 (4m) **Acumen: A Functional Language for Modeling, Simulation, and Verification of Haptic-enabled Environments.**, *Marcia O'Malley / Walid Taha*, Rice University, Houston, TX.
- Provided expert guidance on the modeling of haptic feedback in Acumen.
- Published results in IEEE Embedded Software and Systems.

2008–2009 **Laptics: A Low-cost Haptic Laparoscopy Simulator**, Rice University, Houston, TX.
- Developed a low-cost haptic-enabled laparoscopic training environment

2008–2009 **Robot-assisted Rehabilitation for CIMT**, *Marcia O'Malley*, Rice University / Baylor College of Medicine / TIRR, Houston, TX.
- Developed a user interface using C++ and OpenGL for use by patients and therapists.
- Developed data analysis procedures for providing quick and objective feedback to patients using robotic measures such as trajectory error, smoothness of movement, and hit count

2008–2009 **Automation for Electron Cryomicroscopy**, *Marcia O'Malley*, Rice University / Baylor College of Medicine, Houston, TX.
- Developed a proof-of-concept demonstration of a completely automated cryomicroscopy sample grid preparation process using an Adept Cobra SCARA robot and SolidWorks.

| 2008 (4m) | **Impact of Visual Error Augmentation Methods on Task Performance and Motor Adaptation**, *MAHI Lab*, Rice University, Houston, TX. |

- Designed and executed 20-person study evaluating how amplification of perceived error in a visually-distorted reaching task can increase the rate and quality of motor adaptation to the visual distortion.
- Published results in IEEE Rehabilitation Robotics (ICORR).

2007–2008 **Thermal Energy Storage System**, *David McStravick*, Rice University, Houston, TX.

- Developed a thermal energy storage system using novel techniques and materials that is inexpensive enough for use in homes as small as 500 sq ft.

Activities

2008–2013 **Volunteer Contributor**, *Drupal*, 10 hrs/wk.

- Developer or maintainer of 12 modules, incl. Mailhandler, used by approx. 6,000 sites.
- Contributor to 32 projects, with 890 commits, 1000 posts, and over 50 documentation contributions.
- Attendee at BADCamp '12/13, Stanford DrupalCamp '14, GLADCamp '14, and DrupalCon Austin.

2008–2013 **Trip Leader, Webmaster**, *Rice Outdoors Programs and Education*, 10 hrs/wk.

- Coordinated and led dozens of trips, clinics, and events.
- Developed industry-leading Drupal-based inventory, reservation, and member management system.
- Guided development of program as member of strategic planning committee.
- Red Cross First Aid / CPR, NOLS Wilderness First Aid, Leave No Trace Trainer Certified

2010 **Guest Lecturer**, *Rice Center for Engineering Leadership*.

- Developed and delivered lectures on online marketing, website development, and entrepreneurship.

2004–2008 **President, Webmaster**, *Rice Outdoors Club*, 15 hrs/wk.

- Tripled membership to 150 annual paying members and sponsored 100 events annually, making ROC the single largest club at Rice.
- Developed a PHP-based content, inventory, reservation, and event-management system with more features than that of any other campus outdoors organization.
- Facilitated the expansion of the Rice Outdoors Club into the university-sponsored Rice Outdoors Programs and Education (ROPE) in 2008.

2008–2009 **Member**, *Rice Robotics Club*.

2007–2008 **President, Founder**, *Rice Triathlon Club*.

2003–2004 **Sound Designer, Engineer**, *The Rice Players*.

- Designed roughly half a dozen shows with the Players as well as other community organizations.

Contributing Writer, *Rice Thresher and OPEN Magazine*.

Proficiencies

CAD software	Inventor, SolidWorks, CFDesign	Haptic software	X3D, H3D, HDAL
CMS / infrastructure	Drupal, Aegir, Rackspace, AWS, Drush, Pantheon	Academic software	Matlab, Mathematica, SPSS, SAS
Languages	C++, PHP, Python, MySQL, XHTML, CSS, JS	Dev software	Emacs, SVN, Git, MSVS7/8/9, Komodo, Eclipse, CMake, Doxygen

Certifications

Safety and outdoors | Red Cross First Aid / CPR, NOLS Wilderness First Aid, and Leave No Trace Trainer certifications

Teaching | Completed requirements for Rice OGPS Teaching Certificate

Service

- **Peer Reviewer** for Transactions on Haptics, Transactions on Robotics, Journal of Dynamic Systems, Measurement, and Control, World Haptics Conference, Intelligent Robots and Systems Conference, Dynamic Systems and Controls Conference, American Control Conference, and International Conference on Robotics and Automation
- **Organizing Committee Member** for Haptics Symposium 2012 and 2014, CDC 2010

Grants and Fellowships

2013 **ERIT 2013 grant proposal**, *Baxter: a humanoid robot for enhancing robotics research and education at Rice*, Marcia K.O'Malley, Lydia Kavraki, Mark Moll, $50,000 over two years.

2011 **NASA Space Technology Research Fellowship**, *Human-in-the-Loop Control of a Bipedal Robot with Variable Levels of Autonomy*, Dane Powell, $200,000 over three years.