

## William Hicks

### Contact Information

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### Summary of Qualifications

With graduate degrees in both physics and literary arts, William Hicks is a developer with experience programming for diverse needs and applications. He has worked with physicists to create high-performance multi-threaded simulation software as well as scientific visualization applications, and he has worked with artists to develop creative projects for virtual reality (VR) platforms. His eclectic background and eagerness to learn new technologies give him the flexibility to deal with any programming challenge.

### Professional Experience

#### Developer: Writing3D

Summer 2015 - Present

- Sole developer for Writing3D, an open source project to provide a gentler point-of-entry for students and artists to create interactive VR experiences
- Project will provide Python library and associated graphic user interface for creating VR games and artwork
- Designed to support legacy projects created for Brown University's VR Cave environment as well as new projects for Oculus Rift and Google Cardboard
- Project includes complete Sphinx-based documentation
- Source available at <https://github.com/wphicks/Writing3D>

#### Independent Consultant

2013 - Present

- Provide technical assistance to digital artists for custom software development, with a particular focus on artistic visualization and natural language processing

#### Graduate Fellow: Brandeis University

Fall 2012 - Summer 2014

- Member of the Hagan research group for computational studies of viral budding
- Worked with both GPU- and CPU-based high-performance molecular dynamics simulations
- Independently developed high-performance C++ implementation of algorithm for maintaining surface tension in budding simulations
- Independently developed OpenGL-based visualization software for simulation results, improving rendering time by a factor of 10

#### Research Fellow: CASPER/Baylor University NSF REU Program

Summer 2011

- Developed algorithm for finding  $U(1)$  charges in weakly-coupled free-fermionic heterotic string models
- Produced C++ implementation of algorithm for use in large-scale investigations of string models
- Article describing project details available at <http://arxiv.org/abs/1108.4082>

#### Research Assistant: Brown University Physics Department

Fall 2009 - Spring 2010

- Developed a modified algorithm for resolution of singularities in Mellin-Barnes integrals
- Implemented algorithm as parallelized C++ extension for Python, improving runtime by a factor of 175-450

#### Research Assistant: Brown University Physics Department

Spring 2009 - Fall 2009

- Helped develop an algorithm for optimal sector decomposition of polynomials occurring in Feynman integrals using Zeilinger's Algorithm and Hironaka's Game
- Implemented algorithm in Python for use in high energy theory computations

**Intern:** Consulting Aviation Services, Kennesaw, GA Spring 2008

- Ran computer simulations to determine effect of vortex vortices on various airfoils

## Education

### Brown University

Master of Fine Arts in Literary Arts (2016)

- Participated in Digital Language Arts workshops for developing digital literature
- Served as teaching assistant for *LITR1010G*, a course for development of VR literary projects
- Volunteered technical assistance for other graduate students creating digital art
- Technical coordinator for Interrupt III, a conference on literature for new media
- Solely responsible for design, instruction, and evaluation of two undergraduate poetry workshops

### Brandeis University

Master of Science in Physics (2014)

- 2013-2014 Fellow for Integrative Graduate Education and Research Traineeship (IGERT) in Geometry and Dynamics
- Recipient of 2012-2013 David L. Falkoff Prize for Teaching
- Served as teaching assistant for two advanced introductory undergraduate physics courses, running weekly review sessions and evaluating assignments

### Brown University

Bachelor of Science in Literary Arts and Physics (2012)

- Graduated with Honors in Creative Writing and Physics
- Recipient of 2012 Mildred Widgoff Prize for Excellence in Thesis Preparation (Physics)
- 2012 Literary Arts Nominee for Brown Distinguished Thesis Prize
- Recipient of 2010 Karen T. Romer Undergraduate Teaching and Research Award
- Developed Java-based networking and visualization code for *offset*, a collaborative installation showcasing recombinatory poetry
- Presented digital language arts projects at both the 2012 Interrupt II Conference and 2012 NEASA Digital Revolutions Conference

## Other Work Experience

**Lead Instructor:** Brown University PASS Program Fall 2008 - Spring 2012

- Responsible for designing and teaching a series of single-session classes to help graduate and undergraduates learn essential technical skills for professional and academic success
- Also responsible for training instructors and assisting in lesson plan development

## Additional Skills

- Experienced with best practices for modern version control systems including both Git and Mercurial
- Experienced with multiple Linux distributions
- Experienced with data analysis using R and other statistical software
- Familiar with best practices in Agile software development and test-driven development