

# Jack Rasiel

Ph.D. Student, Computer Science  
University of Maryland, College Park

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**Research interests:** integrating perception, language, and action learning for embodied artificial intelligence.

## EDUCATION

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**University of Maryland, College Park** Aug 2017 - present  
Doctor of Philosophy in Computer Science | GPA: 3.75

**Haverford College**, Haverford, PA Aug 2013 - May 2017  
Bachelor of Science in Computer Science | GPA: 3.3  
Senior Thesis: *Machine Learning for Robotic Grasping*  
Advisor: *Prof. Kostas Daniilidis, University of Pennsylvania*

**Harvard Summer School**, Cambridge, MA Summer 2014

**Selected Coursework:** Deep Learning, Computer Vision, Advances Techniques in Visual Learning and Recognition, Computational Psycholinguistics, Robotics, Algorithm Design and Analysis, Compiler Design

## PROFESSIONAL & RESEARCH EXPERIENCE

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**Teaching Assistant** August 2017 – present  
Computer Vision (CMSC426): contributed to an extensive course redesign, including creating all-new projects.  
Intro to Computer Systems (CMSC216): C programming, including multithreading & memory management

**Research Assistant** Jun 2018 – Aug 2018  
Advisor: *Dr. Cornelia Fermuller*. Worked on action recognition with multimodal data.

**Senior Thesis Research, GRASP Lab** September 2016 – May 2017  
Advisor: *Prof. Kostas Daniilidis*  
Authored an extensive survey on applications of machine learning to robotics grasp synthesis.  
Developed a novel application of CNN-based object pose detection to grasp synthesis (building on the data generation toolchain from my summer work).

**Researcher, GRASP Lab** June 2016 – September 2016  
Led a new research initiative for Prof. Kostas Daniilidis on machine learning for robotic grasp synthesis.  
Designed and developed a new toolchain for generating large synthetic datasets of objects with grasp annotations.  
Contributed to several open-source projects related to grasp simulation:

- Implemented features and bug fixes for GraspIt!, including adding support for the Baxter's grippers.
- Created a ROS interface for GraspIt!, and an easy-to-use Python API.

**Intern, GRASP Lab** January 2016  
Helped develop autonomous object detection and manipulation capabilities for the Baxter.  
Helped implement a ROS-based visual servoing system on the Baxter.

**Developer, Haverford College Digital Scholarship** May 2015 – August 2015  
Developed [The Bridge](#), a web application for ancient Latin and Greek vocabulary learning.  
Communicated effectively with scholars across disciplines to develop an application which best met their needs.  
Engaged in full-stack web development, from front-end UI improvements to an overhaul of the database back-end.

## SKILLS

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**Computer Vision:** extensive experience implementing vision algorithms and building vision applications.  
**Matlab:** implemented algorithms for image seam carving, auto panorama stitching, image warping, and more.  
**OpenCV (Python):** designed systems for object tracking and recognition, camera pose estimation and calibration, and depth reconstruction via structured light. (See “Research Experience”)

**Machine Learning:** implemented CNN-based architectures for object classification & recognition, & regression tasks.  
Extensive experience working with large datasets.

## Simulation and Robotics:

- Simulation:** data generation systems for robot learning using the THOR (Unity-based) & Gazebo simulators.
- ROS:** Extensive experience with ROS, including custom stereo & hand-eye calibration for the Baxter platform.
- Grasping planning:** implemented a ROS interface for the GraspIt! grasping simulator (and supporting tools).
  - Contributed code to the core GraspIt! codebase.

**Programming Languages:** Python, Matlab, C/C++, Javascript, Racket/Lisp, Java, CSS, HTML, Forth

**Machine Learning Packages:** Torch, TensorFlow, Pandas, Numpy, Scikit-Learn, Matplotlib, etc.)

**Other:** Git, basic Linux sysadmin, PostgreSQL, MySQL, Photoshop/GIMP, Sony Vegas

## SELECTED PROJECTS

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### Robust Baselines for Embodied Question Answering (*research, ongoing*)

*With Prof. Abhinav Shrivastava.* Developing robust baselines for embodied question answering. Implemented using the THOR simulator and Tensorflow.

### Deep Learning for Image Homography Estimation (*course project, graduate*)

CNN-based homography estimation, using both supervised and unsupervised training.

### Synthetic Data Generation for Pose Estimation/Grasp Synthesis (*research, undergraduate*)

Toolchain for generating large datasets of synthetic images (rendered in Gazebo) with object pose & grasp labels.

### Optimizing Compiler (*course project, undergraduate*)

Compiler for the Tiger language, written in C++. Function definitions, tail recursion, & garbage collection.

### Stereo Calibration for Poorly-Synchronized Webcams (*independent study, undergraduate*)

Based on ROS and OpenCV. Attempted to calibrate unsynchronized stereo pairs.

## LEADERSHIP & SERVICE

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### Founder and Co-head, Haverford Makerspace

Summer 2015 – Spring 2017

Led the design and construction of [Haverford's first Makerspace](#).

- Applied for and received a **\$10,000 grant** to create the Makerspace. Designed the Makerspace, researched and acquired all needed materials, and coordinated construction. Consulted with campus administration to secure a permanent location for the space.
- Founded the “Makerspace Club” to foster community and secure funding for future activities. Conceived of and planned a variety of workshops and events to encourage community involvement with the Makerspace.
- Encouraged new students to assume leadership roles, ensuring a continuity of management.
- Organized collaborations with Makerspaces and clubs at other colleges, hosting joint events.

### Co-head, Haverford Robotics Club

January 2014 – Spring 2016

Led research and design, organization, planning, and outreach.

- Designed custom UGV and UAV platforms, including LIDAR-based SLAM capabilities.
- Led a team of students from diverse academic backgrounds, encouraging participation of all technical abilities. Designed club activities to engage new members to “learn by doing”.
- Coordinated meetings with robotics professors from nearby universities.

### Member, Haverford Visual Studies Candidate Search

September 2015 – April 2015

Full voting member on the search committee for a new professorship in Visual Studies.

- Resulted in the hiring of Dr. Christina Knight in Fall 2016.
- Reviewed applications and engaged in deliberations to determine finalist candidates.
- Organized student participation in candidate visits and gathered student feedback.

### Student Liaison, Haverford Computer Science Faculty Search

March 2014 – May 2014

Managed student participation in candidate visits. Resulted in the hiring of Dr. Jane Chandler in fall 2015.