

# Stephen Phillips - Curriculum Vitae

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## CONTACT INFORMATION

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## EDUCATION

FALL 2014-SPRING 2021 University of Pennsylvania

**Ph.D. in Computer Science** [Advisor: Kostas Daniilidis]

Graduation: Spring 2021.

Computer Science homepage: <https://www.cis.upenn.edu/index.php>

FALL 2014-SPRING 2021 University of Pennsylvania

**M.Sc. in Computer Science**

Graduation: June 2016.

Computer Science homepage: <https://www.cis.upenn.edu/index.php>

FALL 2010-SPRING 2014 University of California, Los Angeles

**B.S. in Computer Science**

Graduated: June 2014.

Computer Science homepage: <http://cs.ucla.edu/>

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## FACULTY POSITIONS

FALL 2021-SPRING 2023

Swarthmore College, Dept. of Engineering

**Visiting Assistant Professor of Engineering**

Responsibilities:

- Course load: 2 courses per semester
- Research-based independent studies, where students work on directed research projects taken as course credit
- Mentoring summer research interns and senior design projects

SUMMER 2023-PRESENT

The AI Institute

**Robotist for Dexterous Mobile Manipulation Team**

Responsibilities:

- Research on SLAM and sensor fusion, specifically indoor glass detection using ultrasonic sensors
  - Mentoring interns research projects
  - Hardware integration onto Spot Robot
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## TEACHING

AUGUST 2022 - DECEMBER 2022

Swarthmore College

**Instructor for Engineering 28/Computer Science 82 - Robotics [16 students]**

Sophomore/Junior level project-focused course on fundamentals of robotics, including kinematics, dynamics, path planning, and mapping. Project focused course using ROS and the Turtlebot platform to implement concepts gone over in class.

JANUARY 2022 - MAY 2022

Swarthmore College

**Instructor for Engineering 27/Computer Science 72 - Computer Vision [16 students]**

Sophomore/Junior level project-focused course on fundamentals of computer vision. Covered image processing (filtering, image gradients), machine learning (KNN, Neural Networks), and 3D reconstruction (homography estimation, Epipolar geometry). Homework and projects implemented in Python and OpenCV.

JANUARY 2022 - MAY 2022

Swarthmore College

**Instructor for Engineering 71 - Digital Signal Processing [5 students]**

Junior/Senior level course on overview of discrete time signals, Z-transforms, Fourier Transforms, and the Fast Fourier Transform. Designed projects on DNA correlation, Linear Predictive Coding, and sound classification with Band Pass filters.

AUGUST 2021/2022 - DECEMBER 2021/2022

Swarthmore College

**Co-Instructor for Engineering 15 - Fundamentals of Digital and Embedded Systems [57 students]**

Freshman level course on programming with Arduino (used Adafruit Circuit Playground), and labs on hardware implementations. Responsible for lectures, assignments, and exams. Final project on embedded systems in real-world context, with final presentations.

AUGUST 2021 - DECEMBER 2021

Swarthmore College

**Instructor for Engineering 19 - Numerical Methods and Applications in Engineering [19 Students]**

Sophomore/Junior level course on broad overview of numerical methods, with labs in programming the algorithms learned in lecture (e.g. numerical integration, differential equation solvers, eigenvalue computation).

JANUARY 2021 - JUNE 2021

University of Pennsylvania

**Co-Instructor for CIS 107/VLST 209 - Visual Culture through the Computer's Eye [15 students]**

Project-based course at the intersection of computer vision and visual studies, co-designed and co-instructed online with Dr. Will Schmenner. Project teams in the course developed datasets in addition to thinking and writing more generally about the stakes of computer vision and the digital humanities.

JULY 2020 - DECEMBER 2020

University of Pennsylvania

**Head Teaching Assistant for MCIT 515 - Linear Algebra for Machine Learning [Online, 25-35 students]**

Online course for Computer Science masters ([MCIT](#)) students with no expected background in Computer science. Covered basics of linear algebra to prepare for machine learning applications. Responsible for redesigning the projects and project auto-grader. Other responsibilities include grading, office hours, forum monitoring, and several recitation.

JANUARY-MAY 2016, JANUARY-MAY 2018, JANUARY-MAY 2019

University of Pennsylvania

**Lecturer and Teaching Assistant for MEAM620 - Advanced Robotics [30-40 students]**

Project-based course in quadrotor control for Robotics masters students, covering path planning, control theory, and geometric computer vision ([Course page](#)). The students implemented this in simulation as well as on actual laboratory quadrotors. TA in 2016-2018, Lecturer in 2019 (for 6 lectures on computer vision topics).

JANUARY 2016 - JULY 2016

University of Pennsylvania

**Coursera - Robotics: Perception [Online 20-40 students]**

Perception module of the UPenn Robotics Specialization on Coursera covering basics of computer vision ([Course page](#)). Projects included implementing dolly zoom, homography image overlaying, localization via homography estimation, and a simple Structure from Motion pipeline. Primary responsibility in designing quizzes/homework.

JUNE 2016 - AUGUST 2016

University of Pennsylvania

**Coursera - Robotics: Capstone [Online 10-20 students]**

Capstone module of the UPenn Robotics Specialization on Coursera for general audience, focusing on designing a robot and implementing algorithms from other modules in the course ([Course page](#)). Responsibilities included designing the simulations, monitoring the discussion forums, and providing supplementary material.

SEPTEMBER 2016 - DECEMBER 2015

University of Pennsylvania

**Teaching Assistant for CIS390 - Robotics: Planning and Perception [20 students]**

Newly offered course on robotic path planning for undergraduate Computer Science majors. Primarily responsible for designing simulation environment to test robotic planning algorithms for course coding projects. Also responsible with other TAs for homework/test design, and iRobot Create robot platform creation/set-up.

HIGHLIGHTED  
PUBLICATIONS

DECEMBER 2020

ArXiv Preprint

**Learning Portrait Style Representations** [Authors: S. Shaik, B. Bucher, N. Agrafiotis, **S. Phillips**, K. Daniilidis, W. Schmenner]

JUNE 2019

[CVPR 2019 Image Matching: Local Features and Beyond Workshop](#)

**All Graphs Lead to Rome: Learning Geometric and Cycle-Consistent Representations with Graph Convolutional Networks** [Authors: **S. Phillips**, K. Daniilidis]

MAY 2018

[ICLR 2018](#)

**Understanding image motion with group representations.** [Authors: **S. Phillips\***, A. Jaegle\*, D. Ippolito, K. Daniilidis]

JULY 2016

[ICRA 2016](#)

**Fast, Robust, Continuous Monocular Egomotion Computation** [Authors: **S. Phillips\***, A. Jaegle\*, K. Daniilidis]

RESEARCH  
EXPERIENCE

AUGUST 2021 - PRESENT

Swarthmore College

**Undergraduate Research Advisor**

- Advising undergraduate research projects on multi-image matching and camera-radar sensor fusion using machine learning.

AUGUST 2014 - APRIL 2021

University of Pennsylvania

**PhD Student at GRASP Lab [Advisor: K. Daniilidis]**

- Research on solving classic geometric computer vision problems using machine learning techniques, in particular convolutional and graph neural networks
- Dissertation research is on using learning representations for matching. Most recent work primal-dual optimization techniques to aid with matching and outlier rejection
- Work has included robust egomotion estimation, unsupervised learning of motion using convolutional neural networks, and matching using graph neural networks

OCTOBER 2013 - JULY 2014

University of California, Los Angeles

**Undergraduate Researcher at UCLA VisionLab [Director: S. Soatto]**

- Worked on integrating large scale mapping and loop-closure detection in ROS-based real-time visual-inertial odometry system
- Goal of using wide-baseline matching for detecting loop closure after building large-scale, efficiently searchable map

OCTOBER 2012 - OCTOBER 2013

University of California, Los Angeles

**Android Developer Lead at Ozcan Computational Laboratory [Director: A. Ozcan]**

- Led the team that developed medical applications on Android based cell-phones for image processing
- Oversaw and trained newer members of the lab. Presented every other week to the professor on progress of the team

OUTREACH  
VOLUNTEERING

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OCT 1, 2016 - JANUARY, 2020

University of Pennsylvania

**Penn Open Labs**

- Volunteer outreach graduate student club that organizes short TED-style science talks for middle-school to high-school aged students to grow interested in STEM careers
- In 2016, presented the topic of Computer Vision to high school audience. In 2017-2018, acted as the Event Planner Board Member. In 2018-2019, acted as Co-Director, taking responsibility for coordinating the other board members and training new board members.

JULY 2016 - AUGUST 2016

University of Pennsylvania

**NSF Research Experience for Teachers (RET)**

- Mentored middle school math and science teachers from the local Philadelphia School District for six weeks to teach them the experience of research in an engineering setting
- Presented in article in Technically Philly “Why 10 District teachers spent their summer doing grad-level STEM research”. [Link to article](#)
- Assisted teachers in presenting their work to their peers and other graduate students and learn how to bring their work into their classrooms

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AWARDS AND  
CERTIFICATES

NOVEMBER 2020

University of Pennsylvania

**Outstanding Reviewer of 3DV 2020**

From the reviewer pool, 10% were selected for this honor based on review ratings provided by the area chairs

OCTOBER 2020

University of Pennsylvania

**Certificate in College and University Teaching**

From Center for Teaching and Learning. Requirements: Complete five teaching workshops; teach for two semesters; have one lecture observed, recorded and reviewed; and develop and discuss a statement of your teaching philosophy

MARCH 2016

University of Pennsylvania

**NSF Honorable Mention**

National Science Foundation Graduate Research Grant Honorable Mention

JULY 2014

University of California, Los Angeles

**Outstanding Bachelor of Science Degree Award**

For outstanding contributions in research and the community for the Computer Science Degree. Only one given per department at graduation in the School of Engineering

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SOFTWARE  
ENGINEERING  
EXPERIENCE

MAY 2021 - JULY 2021

Waymo

**Waymo Perception Research Intern**

Worked on improving and combining camera and radar perception on the autonomous cars using deep learning techniques

JUNE 2017 - SEPTEMBER 2017

Google

**Google Software Engineering Intern**

Worked on Project Tango (now Daydream) for researching machine learning techniques to improve accuracy of smart phone inertial measurement units

JUNE 2013 - SEPTEMBER 2013

Google

**Google Software Engineering Intern**

Worked on Search Infrastructure on improving Google's Video Search quality, helping locate with higher accuracy video play pages on the web

JUNE 2012 - SEPTEMBER 2012

Zynx Health Technology

**Software Engineering Intern**

Designed and built a web tool to synchronize the databases of clients and the company, working with intern team on company API

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OTHER  
PUBLICATIONS

MARCH 2012 - MAY 2012

University of California, Los Angeles

Albumin Testing in Urine using a smartphone [Authors: Ahmet F. Coskun, Richie Nagi, Kayvon Sadeghi, **Stephen Phillips\***, and Aydogan Ozcan]

JANUARY 2012 - MAY 2012

University of California, Los Angeles

Cellphone microsphere-based fluorescence immunoassay platform for detection of rbSt biomarker in milk samples [Authors: Susann KJ Ludwig, Hongying Zhu, **Stephen Phillips\***, Ashutosh Shiledar, Steve Feng, Derek Tseng, Leendert A van Ginkel, Michel WF Nielen, Aydogan Ozcan]