

Stephen Phillips - Curriculum Vitae

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 2016 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/>

FACULTY POSITIONS

FALL 2021-SPRING 2016

Swarthmore College, Dept. of Engineering

Visiting Assistant Professor of Engineering

Responsibilities:

- Course load: 2 courses per semester
 - Research-based independent studies
 - Mentoring summer research interns.
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TEACHING

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, mainly in 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 - DECEMBER 2021

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).

SEPTEMBER 2015 - DECEMBER 2015

University of Pennsylvania

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

New 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.

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.

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. Current work on using primal-dual optimization techniques to aid with matching and outlier rejection.
- Previous 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 into a system that combines visual and inertial measurements [from a camera and an IMU] in order to estimate ego-motion. System fully implemented using ROS for real-time localization, mapping, and visualization.
- Goal was to construct a large scale, efficiently searchable map of previously visited locations and then to use wide-baseline feature matching techniques in order to detect loop closure, if the camera has returned to a stored location in the 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

OCT 1, 2016 - JANUARY, 2020

University of Pennsylvania

Penn Open Labs

- Open Labs is an 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 responsibly for coordinating the other board members and training newer 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](#).
- Also assisted them in presenting their work to their peers and other graduate students, and helped them learn how to bring this back to their work in the classroom.

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.

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.

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]