Stephen Phillips - Curriculum Vitae

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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/

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

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TEACHING

AUGUST 2022 - DECEMBER 2022 — Swarthmore College
Instructor for Engineering 28/Computer Science 82 - Computer Vision [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 2015 - 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	OCT 1, 2016 - JANUARY, 2020	University of Pennsylvania

OUTREACH VOLUNTEERING

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 responsibly 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

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]