David Schwab

EDUCATION

The Pennsylvania State University, Ph.D. in Aerospace Engineering University Park, PA
Anticipated Graduation: December 2023 GPA: 3.93

The Pennsylvania State University, M.S. in Aerospace Engineering University Park, PA
Graduation: August 2020 GPA: 3.93

The Pennsylvania State University, B.S. in Aerospace Engineering University Park, PA
Graduation: May 2018 GPA: 3.84

ENGINEERING EXPERIENCE

SMART Scholar Aug 2021-Present
The Pennsylvania State University/AFRL-RV University Park, PA/Kirtland AFB, NM

- Developing a framework for Cislunar Space Situational Awareness by combining the cislunar custody maintenance and tracking problem via defining an intelligently designed search region
- Working in collaboration with the Space Vehicles directorate at Kirtland AFB

Research Assistant Fall 2018-July 2021
The Pennsylvania State University University Park, PA

- Researched ability of sigma point sampling and Gaussian Process Regression (GPR) to model angles-only initial orbit determination (IOD) in multiple orbit regimes
- Investigate custody maintenance of non-cooperative, maneuvering

Autonomy Technology Research Center (ATRC) May 2020-July 2021
Wright State University/AFRL-RY Dayton, OH (remote)

- Research on sensing autonomy using state-of-the-art in machine learning
- Continue internship into academic year researching sensor management and tracking maneuvering spacecraft in a Space Situational Awareness framework.
- Working in limited distribution environment

Summer Intern Summer 2019
Griffiss Institute/AFRL-RI Rome, NY

- Collaborated with Dr. Joseph Raquepas from AFRL/RIED to utilize GPR to conduct angles only IOD
- Utilized traditional IOD-methods with importance sampling for IOD uncertainty characterization.

Summer Research Assistant Summer 2018
The Pennsylvania State University University Park, PA

- Utilize OpenCV for feature detection and Lucas-Kanade optical flow methods
- Programing camera pose estimation algorithm on GPU development kit connected to a stereo vision camera

TECHNICAL PRESENTATIONS/REPORTS

- **D. Schwab**, R. Eapen, and P. Singla, "Approximating Admissible Control onto the Cislunar Highways for Detection and Tracking of Spacecraft," In the Astrodynamics Specialist Conference, Charlotte, North Carolina, Aug. 2022.
- M. Mayer, **D. Schwab**, R. Eapen, and P. Singla, "Orbit Characterization and Determination Strategies in the CR3BP Framework," In the 2022 AAS/AIAA Astrodynamics Specialist Conference, Charlotte, North Carolina, Aug. 2022.
- Z. Hall, **D. Schwab**, R. Eapen, and P. Singla, "Reachability-Based Approach for Search and Detection of Maneuvering Cislunar Objects," In the AIAA SCITECH 2022 Forum, San Diego, CA & Virtual, Jan. 2022.
- **D. Schwab**, P. Singla, and S. O'Rourke, "Angles-Only Initial Orbit Determination via Multivariate Gaussian Process Regression," *Electronics*, vol. 11, no. 4, Art. no. 4, Jan. 2022.
- **D. Schwab**, S. M. O'Rourke, and B. L. Minnehan, "Combining LSTM and MDN Networks for traffic forecasting using the Argoverse Dataset," in *2021 IEEE 24th International Conference on Information Fusion (FUSION)*, Sun City, South Africa & Virtual, Nov. 2021, pp. 1–6.
- **D. Schwab**, P. Singla, and D. Huang, "Multi-Variate Gaussian Process Regression for Angles-Only Initial Orbit Determination," In the Astrodynamics Specialist Conference, Lake Tahoe, CA, Aug. 2020.
- **D. Schwab**, "Efficacy of Gaussian Process Regression for Angles-Only Initial Orbit Determination," Master's Thesis, The Pennsylvania State University, 2020.
- D. Gueho, P. Singla, R. G. Melton, and **D. Schwab**, "A Comparison of Parametric and Non-Parametric Machine Learning Approaches for the Uncertain Lambert Problem," In the AIAA Scitech 2020 Forum, Orlando, FL, Jan. 2020.
- S. Hixon, **D. Schwab**, J. Reiter, and P. Singla, "Conjugate Unscented Transformation Based Semi-Analytic Approach for Uncertainty Characterization of Angles-Only Initial Orbit Determination Algorithms," In 70th International Astronautical Congress, Washington, D.C., Oct. 2019.
- **D. Schwab**, P. Singla, and J. Raquepas, "Uncertainty Characterization and Surrogate Modeling for Angles-Only Initial Orbit Determination," In the Astrodynamics Specialist Conference, Portland, ME, Aug. 2019.

LEADERSHIP/VOLUNTEER EXPERIENCE

STEM Tutor November 2016-December 2019
Multicultural Resource Center University Park, PA

- Tutor diverse student populace advised by the Multicultural Resource Center

Resident Assistant Spring 2017-Spring 2018
Office of Residence Life University Park, PA

- Organize weekly community Co-adviser to Hall Council initiative to promote leadership and growth in first-year residents

Maguire Scholar Fall 2014-Spring 2018
Maguire Leadership in Service University Park, PA

- Facilitated a discussion panel about diversity on campus in the spring of 2017
- Coordinated with the Office of Residence Life to organize a cultural fair in spring of 2018
- Attend 10+ seminars on leadership, diversity and awareness, and character development

Honors

- **SMART Scholarship Awardee** (2021-2023)
- **Norwood Wherry Memorial Graduate Fellowship in Engineering** (2021)
- **NASA Pennsylvania Space Grant Consortium Graduate Fellowship** (2020-2021)
- **The Graduate Scholarship Award for Excellence in Engineering** (2020)
- **University Graduate Fellowship** (2018-19)
- **Maguire Scholarship** (2014- 2018)
- **Lou Borges Scholarship** (2016-18)