PAUL GRIFFIOEN

University of California, Berkeley ◇ Department of Electrical Engineering and Computer Sciences
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ACADEMIC POSITIONS

University of California, Berkeley — Berkeley, CA
Postdoctoral Researcher — September 2022 - present
Department of Electrical Engineering and Computer Sciences, working with Murat Arcak

EDUCATION

Carnegie Mellon University — Pittsburgh, PA
Ph.D. in Electrical and Computer Engineering — August 2022
co-advisors: Bruno Sinopoli and Bruce H. Krogh
M.S. in Electrical and Computer Engineering — May 2018

Calvin College — Grand Rapids, MI
B.S. in Electrical and Computer Engineering (with honors) — May 2016
Minor in Computer Science

PUBLICATIONS

1. P. Griffioen and M. Arcak, "Data-Driven Reachability Analysis for Gaussian Process State Space Models," in *2023 IEEE 62nd Conference on Decision and Control (CDC)*. IEEE, 2023.
2. P. Griffioen, A. Devonport, and M. Arcak, "Probabilistic Invariance for Gaussian Process State Space Models," in *Learning for Dynamics and Control*. PMLR, 2023, pp. 458–468.
3. P. Griffioen, "Resilient Cyber-Physical Systems," Ph.D. dissertation, Carnegie Mellon University, August 2022.
4. P. Griffioen, R. Romagnoli, B. H. Krogh, and B. Sinopoli, "Reducing Attack Opportunities Through Decentralized Event-Triggered Control," in *IEEE Transactions on Control of Network Systems*, 2022.
5. P. Griffioen, B. H. Krogh, and B. Sinopoli, "Ensuring Resilience Against Stealthy Attacks on Cyber-Physical Systems," in *IEEE Transactions on Automatic Control*, 2022. (under review)
6. P. Griffioen, R. Romagnoli, B. H. Krogh, and B. Sinopoli, "Reducing Attack Vulnerabilities Through Decentralized Event-Triggered Control," in *2021 IEEE 60th Conference on Decision and Control (CDC)*. IEEE, 2021, pp. 5715–5722.
7. P. Griffioen, R. Romagnoli, B. H. Krogh, and B. Sinopoli, "Resilient Control in the Presence of Man-in-the-Middle Attacks," in *2021 American Control Conference (ACC)*. IEEE, 2021, pp. 4553–4560.
8. P. Griffioen, S. Weerakkody, and B. Sinopoli, "A Moving Target Defense for Securing Cyber-Physical Systems," in *IEEE Transactions on Automatic Control*, May 2021, vol. 66, no. 5, pp. 2016–2031.
9. P. Griffioen and B. Sinopoli, "Assessing Risks and Modeling Threats in the Internet of Things," *arXiv preprint arXiv:2110.07771*, 2021.

10. P. Griffioen, R. Romagnoli, B. H. Krogh, and B. Sinopoli, "Decentralized Event-Triggered Control in the Presence of Adversaries," in *2020 IEEE 59th Conference on Decision and Control (CDC)*. IEEE, 2020, pp. 3236–3242.
11. R. Romagnoli, P. Griffioen, B. H. Krogh, and B. Sinopoli, "Software Rejuvenation Under Persistent Attacks in Constrained Environments," in *21st IFAC World Congress*. IFAC, 2020, vol. 53, no. 2, pp. 4088–4094.
12. P. Griffioen, R. Romagnoli, B. H. Krogh, and B. Sinopoli, "Secure Networked Control for Decentralized Systems via Software Rejuvenation," in *2020 American Control Conference (ACC)*. IEEE, 2020, pp. 1266–1273.
13. P. Griffioen, R. Romagnoli, B. H. Krogh, and B. Sinopoli, "Secure Networked Control via Software Rejuvenation," in *2019 IEEE 58th Conference on Decision and Control (CDC)*. IEEE, 2019, pp. 3878–3884.
14. P. Griffioen, S. Weerakkody, and B. Sinopoli, "An Optimal Design of a Moving Target Defense for Attack Detection in Control Systems," in *2019 American Control Conference (ACC)*. IEEE, 2019, pp. 4527–4534.
15. P. Griffioen, S. Weerakkody, B. Sinopoli, O. Ozel, and Y. Mo, "A Tutorial on Detecting Security Attacks on Cyber-Physical Systems," in *2019 18th European Control Conference (ECC)*. IEEE, 2019, pp. 979–984.
16. S. Mohan, M. Asplund, G. Bloom, A.-R. Sadeghi, A. Ibrahim, N. Salajageh, P. Griffioen, and B. Sinopoli, "Special Session: The Future of IoT Security," in *2018 International Conference on Embedded Software (EMSOFT)*. IEEE, 2018, pp. 1–7.
17. S. Weerakkody, O. Ozel, P. Griffioen, and B. Sinopoli, "Active Detection for Exposing Intelligent Attacks in Control Systems," in *2017 IEEE Conference on Control Technology and Applications (CCTA)*. IEEE, 2017, pp. 1306–1312.
18. K. D. Donohue and P. M. Griffioen, "Computational Strategy for Accelerating Robust Sound Source Detection in Dynamic Scenes," in *IEEE SOUTHEASTCON 2014*. IEEE, 2014, pp. 1–8.

TEACHING

- Teaching assistant for 18-771/24-771: Linear Systems, Fall 2019, Carnegie Mellon University (instructor: Soummya Kar)
- Teaching assistant for 18-771/24-771: Linear Systems, Fall 2018, Carnegie Mellon University (instructor: Soummya Kar)
- Tutor and calculus help session instructor, Calvin College, Fall 2013 - Spring 2014

SERVICE

- Technical program committee member for the *2021 IEEE International Conference on Autonomous Systems (ICAS)*
- Organizer and session chair of the invited session "Cyber-Physical System Security" at the *2020 IEEE 59th Conference on Decision and Control (CDC)*
- Organizer for the DREAM/CPAR Seminar at the University of California, Berkeley
- Session chair at the *4th Air Force Office of Scientific Research (AFOSR) Monterey Training Workshop on Computational Issues in Nonlinear Control: Topics at the Intersection of Deep Learning and Computational Nonlinear Control*

- Session chair at the *3rd Workshop on Computation-Aware Algorithmic Design for Cyber-Physical Systems (CAADCPS)*
- Volunteer at Cyber-Physical Systems Week 2017 (registration desk)
- Reviewer for the following journals and conferences:

  Journals
  - IEEE Transactions on Automatic Control (TAC)
  - IEEE Transactions on Control of Network Systems (TCNS)
  - Automatica
  - IEEE Control Systems Letters (L-CSS)
  - Nonlinear Analysis: Hybrid Systems
  - Asian Journal of Control
  - IEEE Internet of Things Journal (IoT-J)
  - IEEE Transactions on Green Communications and Networking (TGCN)
  - IEEE Transactions on Automation Science and Engineering (T-ASE)
  - IEEE Transactions on Systems, Man, and Cybernetics (TSMC)
  - IEEE Transactions on Services Computing (TSC)
  - IEEE Access
  - IEEE Systems Journal (ISJ)
  - IEEE Sensors Journal
  - Information Sciences
  - Applied Sciences

  Conferences
  - IEEE Conference on Decision and Control (CDC) (2019, 2020, 2021, 2022, 2023)
  - American Control Conference (ACC) (2019, 2022, 2023, 2024)
  - ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS) (2021)
  - IEEE International Conference on Autonomous Systems (ICAS) (2021)
  - IEEE SoutheastCon (2014)

PRESENTATIONS

- "Probabilistic Invariance and Data-Driven Reachability for Gaussian Process State Space Models," *ConVeY Seminar*, Technical University of Munich, 2023.
- "Data-Driven Reachability Analysis for Gaussian Process State Space Models," *4th Air Force Office of Scientific Research (AFOSR) Monterey Training Workshop on Computational Issues in Nonlinear Control: Topics at the Intersection of Deep Learning and Computational Nonlinear Control*, 2023.
- "Data-Driven Reachability and Invariance for Gaussian Process State Space Models," *3rd Workshop on Computation-Aware Algorithmic Design for Cyber-Physical Systems (CAADCPS)*, 2023.

- "Secure Networked Control via Software Rejuvenation," *8th Midwest Workshop on Control and and Game Theory (MWCGT)*, 2019.
- "Active Detection of Integrity Attacks in Control Systems," *Cybersecurity Center for Secure Evolvable Energy Delivery Systems (SEEDS) Industry Engagement Meeting*, 2018.

PROJECTS

- "Computation-Aware Algorithmic Design for Cyber-Physical Systems," University of California, Santa Cruz, sponsored by the National Science Foundation (2022-2023)
- "YOLO Transition to Navy Systems," Software Engineering Institute, sponsored by the Office of Naval Research (2020-2021)
- "Resilience Analysis and Design of IoT-based Smart Infrastructures," Risk and Regulatory Services Innovation Center at Carnegie Mellon University, sponsored by PricewaterhouseCoopers (2017-2018)

UNDERGRADUATE RESEARCH EXPERIENCE

Carnegie Mellon University, Electrical and Computer Engineering — Pittsburgh, PA

- Advisors: Pulkit Grover and Shawn Blanton — June - August 2015
- Researched, developed, and analyzed various fault-tolerant adder designs that implement error correction techniques such as low density parity checks, N-modular redundancy, and repetition

University of Kentucky, Mechanical Engineering — Lexington, KY

- Advisor: T. Michael Seigler — June - August 2014
- Assisted in research for NASA by gathering data and developing an attitude control system for cube satellites using piezoelectric beams and a PID controller

Brockman-Hastings LLC — Lexington, KY

- Advisor: J. Todd Hastings (University of Kentucky) — June - August 2014
- Developed the software and hardware for a prototype camera that monitors the intraocular eye pressure of glaucoma patients

University of Kentucky, Electrical and Computer Engineering — Lexington, KY

- Advisor: Kevin Donohue — June - August 2013
- Assisted in research for the FBI by developing signal processing algorithms that locate, beamform, and mask sound sources from audio files
- Assisted in developing signal processing algorithms that spatially render audio files

Calvin College, Physics and Astronomy — Grand Rapids, MI

- Advisor: Larry Molnar — September 2012 - May 2013
- Operated Calvin College's local telescope for astronomy classes and visitors, and operated Calvin College's remote telescope in Rehoboth, New Mexico for data collection on a variety of astronomical projects

INDUSTRY EXPERIENCE

Lexmark International, Inc., Engine Firmware Department — Lexington, KY

- Manager: Matt Miles June - August 2016
- Developed the framework for testing printers' engine firmware, created a few engine firmware tests, and updated the printer code used for fax over IP (FoIP)

MISCELLANEOUS

Workshops and Competitions

- NextProf Nexus 2022
- Department of Energy's 2019 Cyberforce Competition

Fellowships

- PricewaterhouseCoopers Presidential Fellowship (2017-2018)
- Carnegie Institute of Technology Dean's Fellow (2016-2017)

Memberships

- IEEE
- IEEE-HKN
- IEEE Control Systems Society
- IEEE Young Professionals

Programming Languages

- MATLAB, Simulink, C++, C, C#, Python, Bash, Julia, Java, R, Octave, VHDL, ladder logic, assembly language