PAUL GRIFFIOEN

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ACADEMIC POSITIONS

Dordt University   Sioux Center, IA
Assistant Professor, Engineering Department   June 2024 - present

University of California, Berkeley   Berkeley, CA
Postdoctoral Researcher   September 2022 - July 2024
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 University   Grand Rapids, MI
B.S. in Electrical and Computer Engineering (with honors)   May 2016
Minor in Computer Science

PUBLICATIONS

1. A. Beaudin, P. Griffioen, and M. Arcak, "Gaussian Process Regression for Physics-Informed State Space Models," in *2025 IEEE 64th Conference on Decision and Control (CDC)*. IEEE, 2025. (under review)

2. R. Romagnoli, P. Griffioen, and B. Sinopoli, "Resilient Cyber-Physical Systems: Achieving Safety and Liveness with Software Rejuvenation," in *Constrained Control and Machine Learning – Emerging Methodologies and Applications*. Springer Nature, 2025. (under review)

3. Y. Sonmez, P. Wintz, P. Griffioen, M. Xu, S. Oh, H. Litz, R. Sanfelice, and M. Arcak, "SHARC: Simulator for Hardware Architecture and Real-Time Control," in *28th ACM International Conference on Hybrid Systems: Computation and Control (HSCC)*. ACM, 2025.

4. P. Griffioen, B. Zhong, M. Arcak, M. Zamani, and M. Caccamo, "Data-Driven Controlled Invariant Sets for Gaussian Process State Space Models," in *Automatica*, 2024. (under review)

5. P. Griffioen, B. H. Krogh, and B. Sinopoli, "Ensuring Resilience Against Stealthy Attacks on Cyber-Physical Systems," in *IEEE Transactions on Automatic Control*, December 2024, vol. 69, no. 12, pp. 8234–8246.

6. P. Griffioen, "Why Are There 73 Books in the Bible Used by Roman Catholics?" in *The Bible Answers Project*, November 2024.

7. 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*, September 2024, vol. 11, no. 3, pp. 1576–1586.

8. 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, pp. 4100–4105.

9. 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.

10. P. Griffioen, "Resilient Cyber-Physical Systems," Ph.D. dissertation, Carnegie Mellon University, August 2022.

11. 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.

12. 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.

13. 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.

14. P. Griffioen and B. Sinopoli, "Assessing Risks and Modeling Threats in the Internet of Things," *arXiv preprint arXiv:2110.07771*, 2021.

15. 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.

16. 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.

17. 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.

18. 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.

19. 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.

20. 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.

21. 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.

22. 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.

23. 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

Dordt University

Spring 2025

- EGR 205L/CS 205L: Computer Systems and Digital Circuits
- EGR 362: Dynamic Systems and Process Control
- EGR 365: Control Systems Lab

Fall 2024

- EGR 221: Signals and Systems
- EGR 225: Mechatronics and Instrumentation

Carnegie Mellon University

Fall 2019

- Teaching assistant for 18-771/24-771: Linear Systems (instructor: Soummya Kar)

Fall 2018

- Teaching assistant for 18-771/24-771: Linear Systems (instructor: Soummya Kar)

Calvin University

Spring 2014

- Tutor and calculus help session instructor

Fall 2013

- Tutor and calculus help session instructor

Bellefield Presbyterian Church

Spring 2022

- Knowing and Loving Scripture

Spring 2021

- God's Sovereignty and Human Responsibility

Summer 2019

- The Gospel-Centered Community

SERVICE

- Steering committee member of the Christian Engineering Society Upper Midwest Local Chapter
- Program committee member for the *8th IFAC Conference on Analysis and Design of Hybrid Systems Repeatability Evaluation (ADHS-RE)*
- Organizer for the *4th Workshop on Computation-Aware Algorithmic Design for Cyber-Physical Systems (CAADCPS)*

- 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)*

- Organizer for the DREAM/CPAR Seminar at the University of California, Berkeley

- 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)*

- 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

    - European Journal of Control

    - Asian Journal of Control

    - IEEE Internet of Things Journal (IoT-J)

    - IEEE Transactions on Signal Processing (TSP)

    - 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

    - The Journal of Supercomputing

    - Boundary Value Problems

    - Information Sciences

    - Applied Sciences

  Conferences

    - IEEE Conference on Decision and Control (CDC) (2019, 2020, 2021, 2022, 2023, 2024, 2025)

- American Control Conference (ACC) (2019, 2022, 2023, 2024)
- European Control Conference (ECC) (2024)
- ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS) (2021)
- IEEE International Conference on Autonomous Systems (ICAS) (2021)
- IEEE SoutheastCon (2014)
- Volunteer at Bellefield Presbyterian Church
  - Young adult ministry leader (2018-2021)
  - Small group leader (2019-2021)
  - Worship team, violin (2017-2022)
  - Adult discipleship team (2018-2021)
  - Nominating committee (2022)

PRESENTATIONS

- "A Distinctively Christian Approach to Engineering," *Jubilee Conference*, February 2025.
- "A Christian Approach to Engineering," *Christian Engineering Society Upper Midwest Local Chapter Meeting*, October 2024.
- "The Purpose of Christian Education," *Veritas Graduate Christian Fellowship*, June 2024.
- "Probabilistic Invariance and Data-Driven Reachability for Gaussian Process State Space Models," *ConVeY Seminar*, Technical University of Munich, June 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*, May 2023.
- "Data-Driven Reachability and Invariance for Gaussian Process State Space Models," *3rd Workshop on Computation-Aware Algorithmic Design for Cyber-Physical Systems (CAADCPS)*, May 2023.
- "A Christian Perspective on Artificial Intelligence," *Beatrice Institute*, August 2022.
- "A Distinctly Christian Theory of Truth," *Beatrice Institute*, November 2020.
- "The Sabbath," *Bellefield Presbyterian Church*, June 2020.
- "Wisdom and Technology," *Bellefield Presbyterian Church*, November 2019.
- "Secure Networked Control via Software Rejuvenation," *8th Midwest Workshop on Control and and Game Theory (MWCGT)*, April 2019.
- "The General Epistles," *Bellefield Presbyterian Church*, December 2018.
- "Active Detection of Integrity Attacks in Control Systems," *Cybersecurity Center for Secure Evolvable Energy Delivery Systems (SEEDS) Industry Engagement Meeting*, October 2018.

PROJECTS

- "Computation-Aware Algorithmic Design for Cyber-Physical Systems," University of California, Santa Cruz, sponsored by the National Science Foundation (2022-2024)

- "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 University, Physics and Astronomy   Grand Rapids, MI

- Advisor: Larry Molnar   September 2012 - May 2013

- Operated Calvin University's local telescope for astronomy classes and visitors, and operated Calvin University'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
- Christian Engineering Society
- Christian Scientific Society
- Association of Christians in the Mathematical Sciences
- American Scientific Affiliation