J Peter Brady

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Bow, NH 03304 USA

Research Interests – System and Network Security

- Expertise in the study of system and network exploitation, with a focus on identifying and mitigating unexpected computation
- Conduct research in network protocol security, with an emphasis on identifying design flaws, parsing vulnerabilities, and developing robust mitigation techniques
- Focused on software verification and hardening strategies to improve system resilience
- Conduct research in malware detection and reverse engineering, particularly at the kernel level
- Interested in Unix/Linux kernel security, including low-level vulnerabilities and defense mechanisms

Education

- **Doctor of Philosophy (Ph.D.) in Computer Science** *June 2025*
  Dartmouth College Hanover, NH
  - Thesis: POTSDAM: Pareto Optimization Targeting Security, Data, and Mediation
  - Advisors: Dr. Sean W. Smith (Chair) and Dr. Sergey Bratus
  - Committee members: Dr. Shagufta Mehnaz (Penn State University), Dr. Rajesh Ganesan (George Mason University)
- **Master of Science in Electrical Engineering** *June 2014*
  Worcester Polytechnic Institute Worcester, MA
- **Bachelor of Science in Electrical and Computer Engineering** *May 1978*
  Clarkson College Potsdam, NY

Teaching Experience

- **Dartmouth College** *Mar 2022 – Jun 2022*
  Lecturer COSC 57/257 - Compilers Hanover, NH
  - Designed and taught an undergraduate/graduate-level course on compiler construction
  - Covered formal methods for describing syntax and semantics of programming languages
  - Guided students in building compiler components including front-end parsing, optimization, and code generation
  - Incorporated modern compiler toolchains such as LLVM and ANTLR
  - Emphasized practical applications of compiler techniques in performance optimization and software security
- **Dartmouth College** *2016, 2022, 2024*
  Teaching Assistant Hanover, NH
  - Assisted four courses: Artificial Intelligence, Basics of Reverse Engineeering, Security and Privacy, and Programming Languages
  - Answer student's questions by holding scheduled and impromptu office hours
  - Grade projects, coding assignments, and exams.

Industry Experience

- **BAE Systems** *Jan 2007 – Sep 2016*
  Senior Principal Software Engineer Merrimack, NH
  - Responsible for all technical aspects of a Linux-based portable computer signal processing system for the US Government.
  - Present the status of the program to government representatives.
  - Mentor junior engineer working on the program.
  - Held security clearance.

- **MessageLevel LLC** *Oct 2004 – Dec 2006*
  Senior Software Engineer Cambridge, MA
  - Responsible for designing and developing the Message Level anti-spoofing email verification relay and gateway "appliances" on the Linux platform.
  - Developed security protocols to allow heterogeneous systems to share data.

Publications (B=Book Chapter, C=Conference)

B.1 Prashant Anantharaman, **J. Peter Brady**, Ira Ray Jenkins, Vijay H. Kothari, Michael C. Millian, Kartik Palani, Kirti V. Rathore, Jason Reeves, Rebecca Shapiro, Syed H. Tanveer, Sergey Bratus, and Sean W. Smith. (2020). **Intent as a Secure Design Primitive**. In *Modeling and Design of Secure Internet of Things (eds C.A. Kamhoua, L.L. Njilla, A. Kott and S. Shetty)*, pp. 529-562. Wiley. 12 Jun 2020, New Jersey. DOI: 10.1002/9781119593386.ch23

C.1 **J Peter Brady**, and Sean W. Smith. (2024). **Parsing, Performance, and Pareto in Data Stream Security**. In *2024 IEEE Security and Privacy Workshops (SPW)*, pp. 215–223. IEEE. San Francisco. DOI: 10.1109/SPW63631.2024.00025

C.2 Vijay H. Kothari, Prashant Anantharaman, Ira Ray Jenkins, Michael C. Millian, **J Peter Brady**, Sameed Ali, Sergey Bratus, Jim Blythe, Ross Koppel, and Sean W. Smith. (2020). **Human-Computability Boundaries**. In *Security Protocols XXVII (eds Jonathan Anderson, Frank Stajano, Bruce Christianson, and Vashek Matyáš)*, pp. 157–166. Springer International Publishing. 21 Aug 2020, Cham. DOI: 10.1007/978-3-030-57043-9_15

C.3 Prashant Anantharaman, Vijay H. Kothari, **J Peter Brady**, Ira Ray Jenkins, Sameed Ali, Michael C. Millian, Jim Blythe, Ross Koppel, Sergey Bratus, and Sean W. Smith. (2020). **Mismorphism: The Heart of the Weird Machine**. In *Security Protocols XXVII (eds Jonathan Anderson, Frank Stajano, Bruce Christianson, and Vashek Matyáš)*, pp. 113–124. Springer International Publishing. 21 Aug 2020, Cham. DOI: 10.1007/978-3-030-57043-9_11

C.4 Ira Ray Jenkins, Prashant Anantharaman, Rebecca Shapiro, **J. Peter Brady**, Sergey Bratus, and Sean W. Smith. (2020). **Ghostbusting: Mitigating Spectre with Intraprocess Memory Isolation**. In *Proceedings of the 7th Symposium on Hot Topics in the Science of Security (HotSoS '20)*, pp. 1–11. Association for Computing Machinery. New York. DOI: 10.1145/3384217.3385627

C.5 **J Peter Brady**, Sergey Bratus, and Sean W. Smith. (2019). **Dynamic Repair of Mission-Critical Applications with Runtime Snap-Ins**. In *Critical Infrastructure Protection XIII: 13th IFIP WG 11.10 International Conference (eds Jason Staggs, and Sujeet Shenoi)*, pp. 235–252. Springer International Publishing. 19 Nov 2019, Cham. DOI: 10.1007/978-3-030-34647-8_12

C.6 Prashant Anantharaman, **J. Peter Brady**, Patrick Flathers, Vijay H. Kothari, Michael C. Millian, Jason Reeves, Nathan Reitinger, William G. Nisen, and Sean W. Smith. (2018). **Going Dark: A Retrospective on the North American Blackout of 2038**. In *Proceedings of the New Security Paradigms Workshop (NSPW '18)*, pp. 52–63. Association for Computing Machinery. New York. DOI: 10.1145/3285002.3285011

Presentations

P.1 *Parsing, Performance, and Pareto in Data Stream Security*
2024 IEEE Security and Privacy Workshops
San Francisco, CA
23 May 2024

P.2 *Going Dark: A Retrospective on the Blackout of 2038*
New Security Paradigms Workshop (NSPW '18)
Windsor, UK
28 Aug 2018

P.3 *Dynamic Repair of Applications with Runtime Snap-Ins*
CREDC Pacific Northwest Industry Workshop
Pacific Northwest National Laboratory, Richland, WA
28–29 Nov 2017

Projects

- DigiHeals (Narf/Dartmouth), 2024–current
- DARPA GAPS (GE Research/Dartmouth), 2020–2024
- Popcorn Linux (Virginia Tech/Narf/Dartmouth), 2020–2021
- DOE CREDC (UIUC/Dartmouth), 2016-2020

Professional Memberships

- Member, IEEE

References

1. **Sean W. Smith, Ph.D.**
   Professor, Computer Science
   Dartmouth College
   Email: sws@cs.dartmouth.edu
2. **Sergey Bratus, Ph.D.**
   Associate Professor, Computer Science
   Dartmouth College
   Email: sergey@cs.dartmouth.edu