

NICHOLAS DEMARINIS

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SUMMARY

I am a PhD student at Brown University who enjoys tackling problems at the intersection of software and hardware systems. My research interests include network security, embedded systems, Internet of Things (IoT) security, and software engineering.

EDUCATION

Brown University Providence, RI
Ph.D. Candidate, Computer Science Current
Advanced to Candidacy May 2017
In progress since 2015
Advisor: Prof. Rodrigo Fonseca

Worcester Polytechnic Institute Worcester, MA
M.S. Electrical & Computer Engineering May 2015
Advisor: Prof. Alex Wyglinski
B.S. Electrical & Computer Engineering May 2013
B.S. Computer Science May 2013
Minor in Writing and Rhetoric

AWARDS AND HONORS

ACADEMIC

2015 **Brown University Graduate Fellowship**, Brown University Providence, RI
2013 **Graduate Teaching Assistantship**, Worcester Polytechnic Institute Worcester, MA

TEACHING

2015 **TA of the Year Award**, Eta Kappa Nu, WPI Chapter Worcester, MA
2015 **Honorable Mention**, WPI Teaching Assistant of the Year Worcester, MA
2014 **Community Service Award**, IEEE, WPI Chapter Worcester, MA

PUBLICATIONS

"Toward Usable Network Traffic Policies for IoT Devices in Consumer Networks." N. DeMarinis, R. Fonseca. In IoT Workshop on Security and Privacy (IoT S&P), Nov 2017.

"Switches are Monitors Too! Stateful Property Monitoring as a Switch Design Criterion." T. Nelson, N. DeMarinis, T. A. Hoff, R. Fonseca, S. Krishnamurthi. In ACM Workshop on Hot Topics in Software Defined Networking (HotNets), Nov 2016.

EXPERIENCE

Worcester Polytechnic Institute Worcester, MA
Instructor, Electrical & Computer Engineering Dept. Summer 2014, 2016–2018
Instructor of record for summer offering of embedded systems (2016–2018) and digital systems (2014) course in Electrical & Computer Engineering department, serving about 15 students each term in ECE and Robotics disciplines. Developed new lab materials in collaboration with primary course instructors to prepare new assignments for next academic year.
Teaching Assistant, ECE Dept. Aug 2013 - May 2015
Served as student mentor for undergraduate ECE embedded systems courses, including introductory course with over 100 students per term and advanced course with 45 students per term. Provided hands-on instruction in systems programming, debugging, and embedded systems to students in ECE and robotics in weekly labs and office hours. Coordinated staff of up to 10 TAs and undergrad tutors to manage grading and labs.
Undergraduate Tutor, ECE Dept., CS Dept. Aug 2012 - May 2013
Tutor, WPI Writing Center Aug 2010 - May 2015

Advanced Micro Devices (AMD)

Co-op Engineer

Worked closely with Sr. Software Engineer to design, develop and debug functional tests for Mantle low-level graphics API interfacing with AMD hardware. Identified performance enhancements for internal testing framework to help improve development team's regression testing process.

Boxborough, MA

June 2013 - Aug 2013

Hayward Industries

Engineering Intern

Collaborated with Sr. Electrical Engineer and off-site QA engineers to perform rapid testing and debugging of software fixes for a variable-speed aquatic pump. Maintained a Jenkins CI server to facilitate the software team's development process, working closely with Project Manager to identify a useful configuration.

North Kingstown, RI

May 2012 - Aug 2012

RELEVANT COURSEWORK

Brown University

- Topics in Software Security, *Prof. Vasileios Kemerlis*
- Software Security Exploitation, *Prof. Vasileios Kemerlis*
- Topics in Networks and Distributed Systems, *Prof. Rodrigo Fonseca*
- Intro to Computer Graphics, *Prof. Andy van Dam*

Worcester Polytechnic Institute

- Topics in Network Security, *Prof. Craig Shue*
- Microprocessor & Embedded Sys. Design, *Prof. Gene Bogdanov*
- Cryptography & Data Security, *Prof. Thomas Eisenbarth*
- Operating Systems, *Prof. Hugh Lauer*
- Software Engineering, *Prof. Gary Pollice*

SELECTED COURSE PROJECTS

- **Topics in Software Security**, Brown University, Jan 2018 - May 2018: Developed an approach toward providing execute-only memory on embedded systems using binary instrumentation to restrict memory read operations; built prototype instrumentation framework using LLVM, targeting ARM Cortex-M4 microcontrollers.
- **Topics in Networks and Distributed Systems**, Brown University, Jan 2017 - May 2017: Investigated using eBPF for traffic filtering applications on consumer network routers; ported eBPF tools to OpenWRT toolchain for MIPS architecture and tested example filters.
- **Topics in Network Security**, WPI, Jan 2014 - May 2014: Developed an capability-based access control scheme for home networks by extending DNS queries, in collaboration with one other student.
- **Educational RTOS Development Board, Major Qualifying Project**, WPI, Sept 2012 - May 2013: Developed an educational project for the WPI ECE department to support the junior-level advanced embedded systems course. Created a versatile peripheral board and support library for student laboratory experiments involving interactions with peripheral system design and resource-limited programming techniques.

SKILLS

Programming Languages C, C++, Java, Shell scripting, Python

Experience Linux system administration, Hardware/software debugging, network debugging

Software Development Tools GNU/Linux toolchains, Eclipse (and variants), git, SVN

Hardware Development Tools VHDL & Verilog, NI Multisim, NI Ultiboard

Statistics and Data Visualization Matlab, Microsoft Excel

PGP PUBLIC KEY FINGERPRINT

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