

Matthew Cole

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Education

**State University of New York at
Binghamton**

Binghamton, NY

Ph.D. Candidate, Computer Science

Expected May 2024

❑ Dissertation Topic: “Enforcing Integrity Models Through Hardware-Software Cohesive Systems”

❑ Advisor: Aravind Prakash

**State University of New York at
Binghamton**

Binghamton, NY

M.S., Computer Science

May 2018

❑ GPA: 3.97/4.00

❑ Thesis Topic: “Integrity Models”

United States Naval Academy

Annapolis, MD

B.S., Computer Science

May 2005

❑ GPA: 3.78/4.00 (major), 3.60/4.00 (overall)

❑ Graduated *With Merit*, Upsilon Pi Epsilon

❑ Captained winning team of National Security Agency’s 5th Annual Cyber Defense Exercise

Computing Skills

- Languages: C, C++, Python, x86/RISC-V/ARM assembly, LLVM IR, Rust, Java
- Operating Systems: Unix/Linux, MacOS, Windows
- Other: Benchmarking (SPEC CPU 2006/2017, Hayai, Google Benchmark), Testing (CUnit, Google Test, Boost.Test, Python unittest, LLVM Lit), Build/Continuous Integration (GNU Make, CMake, Github Actions, Travis-CI), Reverse Engineering (Ghidra, Hopper), Doxygen, Git

Citizenship and Security Clearances

U.S. Citizen. Held SECRET (2001-2006), TOP SECRET/SCI (2006-2014) clearances

Work Experience

Research Foundation for the State

Binghamton, New York

University of New York

Research Assistant

January 2018 - Present

- Engineered an implementation of the RISC-V architecture employing inline code and data tagging for integrity models, serving as the foundation for an attack-resistant voting machine
- Performed a novel steganographic analysis of the ARM A64 and T32 architectures by parsing a machine-readable architecture specification and fuzzing executables
- Repurposed Intel Memory Protection Extensions for generalized storage, and implemented analyses for the LLVM compiler toolchain to replace memory accesses with these inlined register operations

Binghamton University

Binghamton, New York

Teaching Assistant

January 2017 - Present

- Assisted graduate and undergraduate level courses, designing and proctoring weekly labs, and grading all coursework. Delivered lectures during instructor-of-record’s absence
- Piloted a Github Classroom/Travis-CI course delivery system to provide instant feedback and version control software experience to students while expediting grading

Binghamton University
Graduate Assistant

Binghamton, New York
August 2015 - December 2016

- Developed a technique for extracting design patterns from C++ source code and encoding as a finite state machine with an XML machine-readable representation
- Researched scientific utilization of performance benchmark tools for the computer security domain.

Trident Training Facility
Instructor

Bangor, WA
October 2011 - June 2014

- Qualified as Instructor, Instructor Evaluator and Course Supervisor. Served as Navigation Department Director, managing a department of 40 instructors and 11 labs. Awarded Navy and Marine Corps Commendation Medal with Gold Star.
- Improved annual throughput in a ship piloting simulator by 18% (75 sessions) by repairing over 30 script files and qualifying two new instructors. Created an additional 32 trainer sessions per month by guiding a comprehensive lab redesign.
- Delivered lectures for 120 submarine officers annually (66% increase) and practical skills training for 23 ships, earning a “highly effective” rating by external auditors.

Amphibious Squadron Six
Department Head

Little Creek, VA
August 2009 - August 2011

- Qualified as Staff Tactical Watch Officer (operations floor manager). Served as Administrative Department Head with 6 direct reports and oversight of 4 ships’ administrative and human resources departments. Awarded Navy and Marine Corps Commendation Medal.
- Authored contingency plans and coordinated with 8 partner nations to deliver over 100K pounds of humanitarian supplies following the 2010 Haitian earthquake.

Headquarters, U.S. Forces Afghanistan
Operations Officer

Kabul, Afghanistan
May 2010 - April 2011

- Guided ad-hoc, cross-functional teams of 6-8 in a position normally assigned to a more senior pay grade. Awarded Defense Meritorious Service Medal.
- One of three officers selected from a theatre-level command to certify deployment readiness for 54 units and 6500+ personnel.
- Expedited processing by 30% (4 days) and enabled a 144% increase (128 items) in annual traffic by improving tracking methods, reducing retention requirements and implementing SharePoint collaboration tools.
- Responded to a major diplomatic cables leak by building a database for tracking compromised personnel that reduced outgoing traffic by 92% (920 messages).

USS Maine (SSBN-741)
Division Officer

Bangor, WA
December 2006 - June 2009

- Qualified as Submarine Warfare Officer and Nuclear Engineering Officer. Awarded Navy and Marine Corps Achievement Medal.
- Held responsibility as the Commanding Officer’s direct representative for a \$2B submarine, \$100M nuclear reactor plant and \$50M-\$75M annual operating budgets.
- Guided operation, maintenance and testing of nuclear reactor instrumentation, control systems and protective features. Resolved a decade-long persistent fault in the S8G Nuclear Instrumentation and Pump Control systems.

United States Naval Research Laboratory
Intern

Washington, DC
May 2004 - August 2004

- Prototyped a Java Management Extension (JMX) for Mobile Ad Hoc Wireless Networks (MANETs) serving city-sized distributed sensor networks in real-time.