

## 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.