Matthew Cole

Email: mcole8@binghamton.edu **Phone:**+1 (206) 790-8791
Web: https://colematt.github.io

Education

State University of New York at Binghamton — Binghamton, NY
Ph.D. Candidate, Computer Science — Expected 2023

- Dissertation Topic: "Enforcing Integrity Models on Tagged Architectures"
- 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

Computing Skills

- Languages: C, C++, Python, x86/RISC-V/ARM assembly, LLVM IR
- Operating Systems: Unix/Linux, MacOS, Windows
- Tools: SPEC CPU 2006/2017, Hayai, Google Benchmark, CUnit, Google Test, Boost.Test, Python unittest, LLVM compiler toolchain, Git, Travis-CI, CMake, GNU Build System, Doxygen, Sphinx

Citizenship and Security Clearances

U.S. Citizen. Held Secret (2001-2006), Top Secret/SCI (2006-2014) clearances

Work Experience

Research Foundation for the State University of New York — **Binghamton, 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 **Binghamton, New York**
Graduate Assistant **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 Bangor, WA
Instructor 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 Little Creek, VA
Department Head 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 Kabul, Afghanistan
Operations Officer 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) Bangor, WA
Division Officer 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 Washington, DC
Intern 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.