James Brahm

Education:

U.S. Air Force Academy, Class of 2019

Computer Science Major, Chinese Minor, Nuclear Weapons and Strategy Minor

GPA: 3.97 Academic GPA: 4.00 (Without P.E. Courses)

Academic Rank: 2 of 1020

Employment:

Cadet, United States Air Force (June 2015 - Present)

Fall 2018: Wing Information Technology Officer

Highest-ranked cadet for information technology issues. Commands the Wing Information Services Team and responsible for advising Wing Commander and ensuring IT support to over 4,000 cadets.

Summer 2018: Cyber Squadron Commander

Led 5 instructors in developing and teaching Cyber 256 course to 32 students. Responsible for developing all-new course infrastructure and content, focusing on operational integration of cyberwarfare into joint warfighting. Course simulated an Air Operations Center and taught students to plan, brief, execute, and debrief offensive cyber operations in small teams.

Fall 2017: Wing Information Technology NCO

Second-highest ranked cadet for information technology issues. Responsible for advising Wing Commander and ensuring IT support to over 4,000 cadets.

Summer 2017: Cyber Squadron Superintendent

Led 7 instructors in teaching Cyber 256 course to 80 students. Responsible for both curriculum and day to day administration of USAFA summer cyber training. Topics included Linux, programming, reverse-engineering, binary exploitation, cryptography, steganography, network and disk forensics, and social engineering.

Fall 2016: Squadron 24 Chief Clerk

Led 26 third-class cadets in administration of Squadron 24 CQ (Charge of Quarters) Program; responsible for the safety, security, and daily operations of each Cadet Squadron. Developed a genetic algorithm to ensure equitable scheduling of cadets.

Researcher, QC Ware Corp. (May 2018 - July 2018)

Designed and patented (pending) an embedding caching system for quantum annealing processors. Created a video demonstrating Cirq integration into the QC Ware platform by using the Quantum Approximate Optimization Algorithm to solve the Max-Cut and Combinatorial Auction problems on a quantum simulator. This video was published by Google in their announcement of the Cirq framework to the public.

Cryptanalysis and Signals Analysis Intern, National Security Agency (June 2017 - July 2017)

Developed a highly modular, reusable software component in C targeting a foreign system and supporting U.S. signals intelligence efforts. Gained experience in signals intelligence and analysis, hardware reverse engineering, software engineering, and cryptography.

Malware Researcher, Dynetics Inc. (June 2014 - June 2015)

Reverse-engineered foreign malware used for intellectual property exfiltration and developed a command and control server for use in realistic penetration testing with existing malware. Developed experimental software to explore new methods of static malware analysis by detecting code similarity.

Awards and Honors:

U.S. Patent Pending, Application No. 16/041,693: "Using Caching Techniques to Improve Graph Embedding Performance" (July 2018)

Harry S. Truman Scholarship (May 2018)

Engineering Division Moore Award for Outstanding Research (September 2018)

One of 4 cadets selected from 1015 to compete for the overall Moore Award for research impact. Selected due to research improving commercial viability of quantum annealing processing.

Superintendent's List (May 2018)

Recognized for placement on Dean's List, Commandant's List, and Athletic Director's List, demonstrating outstanding performance (top 1/3 to 1/4) in academic, military, and athletic mission elements respectively.

Top Student in five Computer Science courses

Computer Networks, Programming Paradigms, Artificial Intelligence, Design and Analysis of Algorithms, and Operating Systems.

Cyber Gauntlet / CyberStakes Live (November 2017) -- Overall winner

Cyber competition conducted in Las Vegas, NV between cadets/midshipmen from the Air Force Academy, the Naval Academy, West Point, and the Coast Guard Academy. Events included network traffic capture/analysis, forensics, binary reverse engineering, malware analysis, cryptography, steganography, bypassing tamper-evident packaging, RF triangulation, and lock picking.

Stamps Scholar / USAFA Leader-Scholar Program (April 2017)

Selected as 1 of 4 scholars out of 1020 cadets based on leadership potential and academic excellence; received $22,000 for technology policy research.

CyberPatriot VII (Spring 2015) -- National Champion and Team Captain; Placed first out of 2185 teams.

Led a team of 6 in a week-long, in-person network security, forensics, and networking competition, placing first in the nation.

U.S. Presidential Scholar (May 2015)

One of 141 students from the U.S. selected by a Presidential Committee and the Secretary of Education in recognition of academic success, community service, leadership, and demonstrated commitment to high ideals.

Eagle Scout with four palms (2011) -- earned 41 merit badges out of 21 required for Eagle

Military:

Cadet Master Cyberwarfare Badge
Highest level of cyberwarfare proficiency recognized by USAFA to include instructor and evaluator certification. Technical skills included reverse engineering, binary exploitation, web exploitation, forensics, steganography, and cryptography.

Powered Flight Program - Landing Tab
Basic proficiency in T-53A Mako. Successful completion of takeoff, flight, landing, and radio calls without instructor intervention.

Freefall Parachuting Course
Five freefall solo jumps and two wind tunnel flights, earning Air Force Parachutist Badge.

Expeditionary Survival and Evasion Training
Training included patrol tactics, base defense operations, urban combat, land navigation, wilderness and urban evasion, and wilderness survival.

Research Projects:

Knowledge Assessment and Rating Program
Full stack system for administering and grading military knowledge tests. Created to improve the timeliness and accuracy of graded feedback on knowledge tests; reduced number of grading personnel from ~160 to 1.

Dexter
Evolutionary algorithm for impartial, preference-based scheduling for the USAFA Charge of Quarters Program. Created as an independent project.

Malfunction
Research tool for detecting code similarity in malware. Created as an employee of Dynetics, Inc to aid in identification of advanced persistent threat malware.

htols
Cyber defense competition software for training high school cybersecurity teams. Created as an independent project to enable CyberPatriot mentors and teams to create scored virtual machine images quickly and easily.

Speaking Engagements:

AOC 55th Symposium (Electronic Warfare Organization)
November 2018, Washington, DC
Electronic Sheepdogs: Teaching the Hacker's Mindset to Everyone

Rocky Mountain Cyberspace Symposium 2016
February 2016, Colorado Springs, CO
Panel: Young Leaders' Perspective on Risk Drivers

ShowMeCon 2015
June 2015, St. Louis, MO
Automated Static Malware Analysis Using Function-level Signatures or: How I learned to Stop Worrying and Love the APT

CBS Sunday Morning
26 April 2015
"Strengthening the Nation's Defense Against Hackers"

BSides Huntsville 2015
February 2015, Huntsville, AL
So Easy a High Schooler Could Do It: Static Malware Analysis Using Function-level Signatures

Space and Missile Defense Symposium
August 2014, Huntsville, AL
Developing the Future Cyber Workforce - A Collaborative Approach

ISACA Huntsville Chapter
July 2014, Huntsville, AL
Topic: Applying cybersecurity frameworks to practical defense

NPR: All Things Considered
11 November 2013
"Army Looks to Schools to Find the Next Cyberwarriors"

AOC 50th Symposium
October 2013, Washington, DC
Developing Future Electromagnetic Spectrum Operations Warriors

Service Activities:

CyberPatriot Technical Mentor (2015 - Present)
I provide technical guidance and instruction to high school cybersecurity teams, both in-person and remotely. Topics include use of the command-line, Linux and Windows system administration, programming, network architecture, Cisco IOS, and forensics.

USAFA Personal Ethics and Education Representative or PEER (Aug 2017 - Present)
PEERs provide education, outreach, listening, and referral services to cadets who are facing troubling issues such as stress, anxiety, depression, suicidal thoughts, eating disorders, grief, relationship issues, human relations, and sexual assault.