Benjamin A. Mixon-Baca

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Core Competencies

Reverse Engineering	Python, C/C++, Go	Computer Networking	Security Tool Development
Machine Learning	Penetration Testing	OSINT R&D	Digital Surveillance
Management	Patent Writing	Public Speaking	Technical & Non-technical Writing

SKILLS & ACTIVITIES

Technical Skills: Python, C/C++, gdb, windbg, panda-re, virtualization, TCP/IP, network security, firewalls, binary analysis, reverse engineering, security assessments, threat hunting, censorship, circumvention, digital surveillance, mobile development and analysis

Languages: English

Volunteer: Biology, Security, and Society Program Director, ASU

PROFESSIONAL EXPERIENCE

Treasurer, Co-Founder, Breakpointing Bad, Albuquerque, NM   **December 2019-Present**
- Performed threat hunting using OSINT data collection, monitoring and analysis
- Performed mobile malware triage using JADX, Ghidra, Python
- Wrote report and presented findings to technical and non-technical stakeholders
- Traveled domestically and internationally to present results and complete goals

Research Assistant, Arizona State University, Tempe, AZ   **June 2020 – Present**
- Identified multiple vulnerabilities in Netfilter on Linux and IPFW, PF, and IPFILTER on FreeBSD that can be exploited to subvert OpenVPN, OpenConnect, and WireGuard. This work is recognized as CVE-2021-3773
- Developed techniques to measure and identify Internet censorship at the network board of the Russian Internet
- Developed tools and techniques to analyze the Linux network stack using QEMU/KVM, gdb, and panda-re

Senior Information Controls Fellow, Open Technology Fund, Ann Arbor, MI   **November 21-22–December 23-24**
- Developed tools for real-time, automatic application threat hunting on high-speed network traffic
- Identified and reverse engineered multiple (PC and mobile) applications with weak security
- Developed web application for OSINT research, analysis, and reporting for technical and non-technical stakeholders

Innovation Team Lead, RiskSense, Albuquerque, NM   **August 2017 – March 2020**
- Contributed to an in-house automated exploitation tool using python, metasploit framework, impacket, nmap, bloodhound, and Koadic
- Proposed and developed a machine learning pipeline for classifying vulnerabilities into high and low likelihood of exploitation based on OSINT sources such as NVD, twitter, reddit, and bugtraq mailing list information
- Managed a team of 3 security engineers on projects ranging from machine learning to security assessment
- Performed penetration tests

LEADERSHIP EXPERIENCE

Director, Biology, Security, and Society Scholars Program, Arizona State University   **September 2018 – Present**
- Perform technical and non-technical interviews for engineering and biology Bachelors and Masters students.
- Coordinate disparate projects between multiple technical teams.
- Facilitate weekly career enrichment seminars focused on research at the intersection of biology, security, and society.

Innovation Team Lead, RiskSense   **May 2018 - March 2020**
- Conducted technical and non-technical interviews for engineering staff.
- Coordinated weekly meetings, defined goals, timelines, identified blockers, and proposed solutions.

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EDUCATION

Ira Fulton School of Engineering, Arizona State University, Tempe, AZ   **May 2025**
Doctor of Science, Computer Science

University of New Mexico, Albuquerque, NM
Master of Science, Computer Science   **May 2017**
Bachelor of Science, Computer Science   **May 2015**
- Awards: Sigma Xi, Superior Undergraduate Student
- Awards: University of New Mexico Senior of the Year
- GPA: 4.00

Publications

Attacking Connection Tracking Frameworks as used by Virtual Private Networks   **September 2024**
Benjamin Mixon-Baca, Jeffrey Knockel, Diwen Xue, Tarun Ayyagari, Deepak Kapur, Roya Ensafi, Jedidiah R. Crandall,
PETS 2024

TSPU: Russia's decentralized censorship system   **October 2022**
Diwen Xue, Benjamin Mixon-Baca, ValdikSS, Anna Ablove, Beau Kujath, Jedidiah R. Crandall, Roya Ensafi
IMC 2022

Challenges and Opportunities for Practical and Effective Dynamic Information Flow Tracking   **November 2021**
Christopher Brant, Prakesh Shretha, Benjamin Mixon-Baca, Kejun Chen, Said Varlioglu, Nelly Elsayed, Tier Jin, Jedidiah
R. Crandall, Daniela Oliviera
AMC Computing Surveys

Port Shadows via Network Alchemy (CVE-2021-3773)   **September 2021**
Benjamin Mixon-Baca, Jedidiah R. Crandall
Self-published/Blog

Patents

Predicting and Quantifying Weaponization of Software Weaknesses (US-20240126891-A1)   **April 2024**