Clinton Bowen

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EDUCATION

CAL STATE NORTHRIDGE

Masters in Applied Mathematics
December 2016

BS in Applied Mathematics
May 2010

LINKS

LinkedIn

SOFTWARE

LANGUAGES

C
C++
C#
Java
LaTeX
Mathematica
Matlab
Python
SQL (MySQL, PostgreSQL, SQLite)
R

FRAMEWORKS & LIBRARIES

.NET
Sage Python
SciPy
RSA BSAFE
Gurobi
CPLEX
Django (and GeoDjango)
Honggfuzz
AmericanFuzzyLop

DEVELOPMENT OPERATIONS

IC-Agile Certified Professional
Secure Development Lifecycle Practitioner
DOD Secret Clearance

SKILLS

SYSTEM ENGINEERING

GPS
Subject Matter Expert (SME) on C/A and CNAV

CRYPTOGRAPHY + CYBER-SEC

Engineering Standards
SME on FIPS 140 to 202 • Cyber-Security Framework • SME on Special Publications 800 Series • RFCs • CNSSPs • DODAF

EXPERIENCE

BOOZ ALLEN HAMILTON | Senior Cybersecurity Engineer

August 2016 – Present | El Segundo, CA

- Android Pentesting Project
  - Pentesting Android 4.4 and Cyanogenmod 10.2 for vulnerabilities
  - Fuzz testing certain components of Android
  - Sideloading software onto an Android phone
- Launch, Tracking, and Range Safety (LTRS) Cyber Security Assessment
  - Developing the cyber security technical requirements for the next generation launch platform based primarily out of the Cape Canaveral for launching spacecraft
  - Determine whether if the existing communication infrastructure at LTRS is compliant with the Risk Management Framework

THE MITRE CORPORATION | Senior Cybersecurity Engineer

April 2015 – July 2016 | El Segundo, CA

- Static Analysis Continuous Integration Platform
  - Worked on a KLEE symbolic execution plugin for Jenkins Continuous Integration tool
  - Provided guidance on JavaPathfinder symbolic execution plugin for Jenkins Continuous Integration tool
- Cyber Command and Control System Software Development
  - Developed and analyzed potential functional failure of Air Force cyber operations from an infrastructure model of Air Force equipment
- Source Code Vulnerability Review for GPS
  - Provided security assessment to military user equipment C source code with Fortify
  - Provided security assessment to radionavigation software C source code with Fortify
  - Performed a FOSS analysis on two military user equipment code bases with Palamida
- System Engineering Consulting on the Modernization Effort of AEP Ground Segment
  - Gathered technical assessments from various organizations to perform data exchanges via AEP
- Consulting on Key Management Concept of Operations for OCX Ground Segment
  - Providing guidance to sponsor and contract for NSA Type 1 cryptographic key management

BOOZ ALLEN HAMILTON ENGINEERING SERVICES, LLC | Technologist

June 2010 – April 2015 | El Segundo, CA

- Developed & demonstrated a cryptographic use case using SHA-3 based algorithms in embedded C software for a PIC24HJ12GP201I Controller

COURSEWORK

GRADUATE

Markov Chains
Measure Theory
Partial Differential Equations (PDEs)
Regression Analysis
Functional Analysis
Point Set Topology
Numerical Methods for Interpolation
Numerical Methods for PDEs
Mathematical Modelling

COURSERA

Discrete Optimization
Linear and Discrete Optimization

BLACK HAT 2014

C and C++ Source Code Auditing
Application Security for Developers and Attackers

IACR

Workshop on EasyCrypt (2015)
School on Securing Cryptographic Alogrithms and Devices (2015)
Real World Crypto (2016)
WhiBox (2016)
Real World Crypto (2017)

MATH

23rd International Symposium on Graph Drawing and Network Visualization (2015)

BOOZ ALLEN HAMILTON ENGINEERING SERVICES, LLC | TECHNOLOGIST

Continued...

- Directing weekly technical meetings between a team of software developers and clients for project management
  - Capture customer input into software development and system engineering requirements and tasks
  - Provide schedule and progress of software development & system engineering tasks and backlog items
  - Illustrate and present system designs and constraints to customers in DOD Architectural Framework formats
  - Prioritize software development tasks for software development team
- Provides mentorship for software development interns
  - Issue tasks for interns
  - Provide guidance for completion of tasks
- Provided cryptographic analysis for a GPS CNAV project
  - Identified feasible cryptographic solutions
  - Assisted in drafting a cryptographic protocol for authentication of associated data and high level overview of key management
  - Consulted and developed software for prototyping the cryptographic concept
- Designed a SOAP software architecture for GPS SAASM Mission Planning System
- Designed C# framework, ATLAS, for internal use within the Booz Allen Hamilton Advanced Research and Development office
- Desgined, developed, & tested a MATLAB Reed-Solomon error correction code library without the MATLAB Communication Toolbox
  - Allows for arbitrary (n, k) code encoded using Galois fields
  - Uses a Berlekamp-Welch decoding scheme
- Designed, developed, & tested a random number generation test suite in C# based on NIST SP800-21
  - Performs a bank of statistical confidence interval tests to assure randomness of data for hardware random number generators
- Developed & tested C/C# cryptographic (ECDSA & SHA-2) software for a software GPS receiver
  - Implemented fast galois addition over elliptical curves
  - Tested for cryptorgraphic algorithm validity and security measures.
- Designed, developed, & tested message optimization software for GPS L2C and L5 signals in python
  - Designed a periodic graph which models feasible message sequences
  - Linear inequalities were derived from the L2C and L5 constraints using the periodic graph
  - Message sequencing results we derived using linear programming
- Corrected NIST test vectors for SHA-2 based digital signature algorithms
- Contributed the 'K' in SHAKE for NIST FIPS-202
- Designed and prototyped a cradle to grave management system for NIST compliant cryptographic keys that met NIST SP800-53 SC-12 (1) and (2)

RESEARCH

REALIZATION OF SIMPLY CONNECTED POLYGONAL LINKAGES AND RECOGNITION OF UNIT DISK CONTACT TREES |Springer Verlag, Lecture Notes in Computer Science, September 2015

LIE GROUPS, HOMOGENEOUS MANIFOLDS, AND COMPLEX PROJECTIVE SPACES | Co-Authored with Mayra Moran and Atour Bean, May 2009

Partially funded by NSF Grant DMS-0502258

PRESENTATIONS

2015	Message Sequence Optimization over L2C & L5
2014	Permutation and Construction Library: A Library for Permutation Based Cryptography
2014	What the Heck is Fuzz-Testing?
2014	BlackHat, DEFCON, SHA-3, & DIAC: The Summer Conferences
2014	Configuration Management within Booz Allen Hamilton and an Introduction to C# ATLAS
2014	Message Optimization over L2C and L5
2013	Error Correction Codes over Finite Fields
2012	Mission Planning Optimization
2010	Reed Solomon Error Correction Codes

MISCELLANEOUS SOFTWARE DEVELOPMENT

SOFTWARE DEVELOPMENT IN ACADEMIA August 2007 – May 2010 & August 2014 - December 2016 | Cal State Northidge

- Developed a python script to generate random trees using Markov chains
- Developed R scripts to perform multiregression analysis (ANOVA, R^2, principle component analysis) on car data to model miles per gallon
- Developed R scripts for bootstapping limited samples to develop statistical tests over the sampling distribution
- Developed a MATLAB application which was able to identify individuals from their voice using partial differential equations
- Used C++ OpenCV to identify text in Arabic and English from a digital images. Application was used for an unmanned air vehicle project
  - Used Canny algorithm, splines, and Hausdorff distance measurements to estimate characters in Arabic and English
- Developed a python application to optimize resource scheduling management software using evolution algorithms
- Modeled Joukowski air foils (aircraft wing and lift) as a system of partial differential equations in Mathematica
- Modeled growth and decay of animal and bacteria populations as a system of partial differential equations in Mathematica

PERSONAL SOFTWARE DEVELOPMENT June 2004 – Present

- Currently developing an open source, formally verified, symbolically tested, library for standardized cryptographic permutations and constructions
  - Using LLVM KLEE based platforms for symbolic testing
  - Permutations slated for inclusion are Keccak and any permutation that is selected for the second round of the authenticated encyrption associated data algorithm competition, CAESAR.
- Developed python code for interpolating stochastic differential equations for use in modern portfolio theory and management
- Web development in Drupal CMS (version 4,5, and 6)