Anthony Melaragno

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Professional Objective

Utilizing my extensive experience in academia, industry, and the intelligence community to provide comprehensive and applied view of cyber physical issues that faces the country. The experience and knowledge that I have attained can be used to prepare the next generation of software engineers and computer scientists to defend or attack cyber physical systems.

Security Clearance

Top Secret SSBI

Education

2016   P.h.D. Information Technology - George Mason University

2004   M.S. Telecommunications - George Mason University

1997   B.S. Electrical Engineering - The Pennsylvania State University

Academia

2014 - 2016   Department of Homeland Security (DHS), US
Researcher

Involved in research and development of enhanced infrastructure security for DHS sponsored research at George Mason University.

Technologies: Cryptographic Algorithms, GNU Radio, REDIS Middleware, C, C++, Python, GIT, SVN

2007 - 2016   George Mason University, Fairfax, VA
Researcher

Involved in modeling protocols and applied research in the development of infrastructure and transportation security. Doctoral research involved the development of a cognitive engine for rail infrastructure and enhanced cryptography for bandwidth constrained communication devices. The research is both theoretical and applied in enhancing the Positive Train Controller and the locomotive control and signaling network.

Technologies: Cryptographic Algorithms, GNU Radio, REDIS Middleware, C, C++, Python, GIT, SVN

2004 - 2006   George Mason University, Fairfax, VA
Adjunct Instructor

Created the curriculum and taught a course in the master's telecommunications program. The course consisted of pre-calculus, basic electrical engineering, telecommunications, and digital logic.

| **2012 -** | Howard University, Washington, DC |
| **2013** | *Researcher* |

Involved in the development of software to simulate high-speed trains entering and leaving regions. The model involved developing a distributed client and servers architecture written in C. The architecture utilizes the uTesla protocol for forward hashing to safeguard the integrity of the data messages. The utilization of the project is geared toward Software Defined Radios (SDR).

Technologies: Cryptographic Algorithms, C, C++, Python, GIT, SVN

| **2012** | Naval Postgraduate School, Monterey, CA |
| | *Research Fellowship* |

Aided in the development of data scanners, which parse data across sectors of a hard disk. The software is integrated into computer forensics software, i.e. bulk extractor, which is used to detect, parse and store the presence of information on computer systems.

Technologies: C++, Autotools, SVN

Employment History

| **2017 -** | United States Naval Academy, Leahy Hall, Annapolis, MD, 21401 |
| **Present** | *Assistant Professor* |

Provides educational instruction to future leadership. I provide instruction a variety of low level and high level technologies. I leverage my experience and education to educate the Midshipmen. In addition to educational responsibilities my current research is designing and developing a fully adaptable real time firewall which adjusts to threats without administrator interactions.

Technologies: C, Python, Java, HDL, Assembly

| **2017 -** | Consultant, 9004 Prince William Street #333, Manassas VA, 20110 |
| **Present** | *CEO || Chief Scientist* |

Responsible for the development of advanced technologies in machine learning, communications, and analysis for applications in the intelligence community.

Technologies: C, Python, OpenCV, Machine Learning, Advanced Technologies

| **2017 -** | Strategic Mission Elements, 15040 Conference Center Drive, Suite 300 |
| **2017** | *Senior Scientist || Research and Development Lead* |

Responsible for the development and pursuit of new technologies in a variety of disciplines related to computer science, electrical engineering, and communications.

Technologies: C, Python, OpenCV, Machine Learning, Advanced Technologies

| **2015 -** | L-3 Communications, 600 Third Avenue, New York, NY |
| **2016** | *Software / Systems Engineer* |

Software and Systems development to support dissemination of Improvised Explosive Device location information to the warfighter on mobile technologies, supporting both iPhone and Android for Army NettWarrior. Additionally, development of Amazon EC2 Chef deployment scripts to support auto creation of server infrastructure.

Technologies: iPhone XCode, Android Studio, Amazon EC2, Chef

2012 -
2015
Rockwell Collins, 400 Collins Road N.E., Cedar Rapids, IA
Principle Systems Engineer

Developed Linux kernel level software to control the communications of Linux across its interface bus. Worked in Integration and Testing to test avionics control systems for Unmanned Air Vehicles (UAV). The project involved testing the hardware across various temperature, pressure, and vibration scenarios.

Technologies: Linux Kernel Development, C, Autotools, Doors, UAV

2007 -
2012
Linquest Corporation, 14151 Newbrook Drive, Chantilly, VA
Principle Systems Engineer

Defined Information Assurance requirements for a satellite ground communication system utilizing DoDI 8500.2 instructions. Created a prototype for a data fusion / mining tool using Linux, MySQL, Apache, and secured the website using SSL. MediaWiki was used to provide users a common look and feel interface. Performed an analysis for DISA to determine a solution in the event of optical line breaks. Satellite Link budgets were used to determine current satellite communications capabilities. Authored the Systems Engineering Management Plan (SEMP) for a satellite communication project. Assisted in a site survey selection team for a network control center. Member of a systems engineering team that refined the System Specification document for the network control center. Investigated commercial and MILSATCOM alternatives to existing communication services on board the executive aircraft fleet focusing on capability and information security. Performed satellite communications link budget analysis to determine redundancy capability of existing MILSATCOM systems to aid in restoration of critical data services to the Global Information Grid (GIG). Worked with Satellite Mission Command (SMC) to design and architect network ground systems to extend communication coverage in the Alaskan polar region.

Technologies: MySQL, Apache

2006 -
2007
Harris Corporation, 1025 W. NASA Boulevard, Melbourne, FL
Senior Systems Engineer

Lead Engineer providing expertise in the design and development of an interoperable network between the United States and multinational networks. Aided in integration of instant messaging services to international partners.

Technologies: Linux Administration

2005 -
2006
ArgonST, Fairfax, VA
Senior Systems Engineer

Performed test and evaluation of various low noise amplifiers to aid in improving Time Difference of Arrival (TDOA) and Frequency Difference of Arrival (FDOA) estimates. Performed a trade study of various GPS systems to evaluate clock accuracy, which would provide more precise geo location results. Performed hardware and software integration and testing of an ELINT system.

Technologies: Doors, Tektronic Spectrum Analyzers

2001 -
2005
Raytheon, Fairfax, VA
Senior Systems Engineer

Integration and Test lead responsible for test case refinement, verification and validation of requirements, and hardware and software unit level testing for an Unmanned Air Vehicle (UAV). Responsible for mentoring junior engineers in requirements process. Created Client/Server software in C / Oracle 9i to aid in telecommunication hardware evaluation. Created custom perl script to automate file transfers.

Technologies: C, Oracle, Matlab

| 2000 - 2001 | Booz-Allen and Hamilton, Tysons Corner, VA |
| | *Consultant* |

Performed an interoperability study of a federal and state law enforcement community interstate wireless communications system. Created custom C++ software to model satellite communication links using STK. Used OPNET to simulate Local Area and Wide Area Networks (LAN/WAN).

Technologies: OPNET, STK, Networking

| 1998 - 2000 | Raytheon, Fairfax, VA |
| | *Systems Engineer* |

Involved in Integration and Testing of both hardware and software of a embedded electronic system. Extensive knowledge in networking, CORBA, and Object Oriented Design and Development. Created a thread scheduler in C++ utilizing design patterns.

Technologies: C, VxWorks, CORBA, Networking, C++

Engineering Skills

- **Programming Languages**

  GPU: NVida CUDA C programming
  Low Level: C, C++, Objective C, Java
  Database: Oracle, MySQL
  Scripting: Python
  Version Control: SVN, GIT

- **Modeling Languages**

  Mathematical Modeling: Matlab, R, Octave
  Satellite & Networking: Satellite Toolkit (STK), OPNET
  Formal Modeling: AVISPA, Communicating Sequential Processes (CSP)

- **AWS**

  Cloud Formation - Chef Scripting and Python
  EC2 - Configuration and Linkage

Interests

- **High Performance Computing: Hadoop, Spark on AWS**
- **GPU Development for NVida**
- **GNU Radio and Software Defined Radios**
- **Vehicular Infrastructure Security**

Publications

A. Melaragno, D. Bandara, A. Fewell, and D. Wijesekera,*Rail radio intrusion detection system (RRIDS) for communications based control (CBTC),* IEEE International Conference on Intelligent Rail Transportation, p. 9, August 2016.

D. Bandara, A. Melaragno, D. Wijesekera, and P. Costa, *A Case Study of Cognitive Radio Networks: Secure Spectrum Management for Positive Train Control.* Springer Science, 2016.

D. Bandara, A. Abadie, A. Melaragno, and D. Wijesekara, *Providing wireless bandwidth for high-speed rail operations,* Procedia Technology, vol. 16, pp. 186 – 191, 2014.

D. Bandara, A. Melaragno, D. Wijesekera, and P. Costa, *Multi-tiered cognitive radio network for positive train control operations multi-tiered cognitive radio network for positive train control operations multi-tiered cognitive radio network for positive train control operations,* Joint Rail Conference, p. 10, April 2016.

A. Melaragno, D. Bandara, D. Wijesekera, J. B. Michael, *Securing the ZigBee Protocol in the Smart Grid,* Computer, vol. 45, no. 4, pp. 92-94, April, 2012.

Awards

Certificate of Recognition, Contractor of the Quarter (July - September 2015) - Engineering, Colonel Scott Anderson, Director, Operational Integration Office

L3 Corporation, Hero of the Month Award, Month of June 2015, Mr. Aaron Godeaux, Lead Systems Engineer