Christopher Mansour, Ph.D.

Assistant Professor of Cyber Security

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Experience

Mercyhurst University — Erie, PA, USA
Assistant Professor of Cyber Security — *July 2018 - Present*

- Assistant Professor in the Department of Computing and Information Science
- Developing the Online Graduate Cyber Security Program and the Undergraduate Cyber Security Program
- Teaching Cyber Security Courses
- Conducting Research in the areas of Mobile Security
- Advising a graduate student in her research in Cyber Security/Data Science
- Organizing weekly Research Seminars

Villanova University — Villanova, PA, USA
Visiting Doctoral Researcher — *May 2018 - June 2018*

- Conducted research in the areas of Cyber Security, Networks Security, Software Defined Networks and Software Engineering (Results: 1 pending journal publication)

Villanova University — Villanova, PA, USA
Graduate Research Assistant/Doctoral Candidate — *September 2012 - May 2018*

- Conducted research in the areas of Cyber Security, Networks Security, Software Defined Networks and Software Engineering (Results: 3 journal articles and 11 conference publications)

Lilly Pulitzer — King of Prussia, PA, USA
Web Developer Intern and Progressive Web Apps Developer — *May 2017 - August 2017*

- Research and development in the field of progressive web application technologies (ClojureScript, React, Babel, React-Native, Reagent, Re-Natal)
- Built a demo web application using ClojureScript and Reagent
- Built an iOS and Android mobile demo applications based on ClojureScript, Reagent, and React-Native
- Maintained and modified a Node JS based Middleware between the web application and the iOS mobile app
- Maintained the Web Application (Frontend/ Backend)

iBS Soft Solutions — Beirut, Lebanon
Software Engineering/Full Stack Developer — *February 2012 - August 2012*

- Software development of intelligent business solutions for CVS Caremark, USA
- Maintenance of the Web Applications built and implementing new features upon request

OGERO Telecommunications — Beirut, Lebanon
Telecommunications Engineering Intern — *June 2010 - September 2010*

- Maintenance and programming of the Siemens switching systems present in the exchange
- Designed and built a public switched telephone network for a sector in Beirut city

Education

- **Villanova University** — Villanova, PA, USA
  Ph.D. in Engineering — *May 2018*

  - Department of Electrical and Computer Engineering
  - Dissertation Title: Trust and Reliability for Next Generation Networks: A Layered Approach. GPA: 3.96/4.00
  - Adviser: Dr. Danai Chasaki, Associate Professor
  - Ph.D. Committee Members:
    * Dr. Richard Perry, Associate Professor,Department of Electrical and Computer Engineering, Villanova University
    * Dr. James Solderitsch, Research Professor, Department of Electrical and Computer Engineering, Villanova University
    * Dr. Sriram Natarajan, Network Engineering, Google, Inc.

- **Villanova University** — Villanova, PA, USA
  Teaching Engineering in Higher Education Certificate — *December 2017*

  - Certificate program is made of a theoretical course and practicum
  - The theoretical course covers basic higher education pedagogy, learning theories, course design, assessment strategies, effective technology use, fostering creativity and active learning strategies
  - In the practicum, students will be paired with one of the College's professors. The latter serves as the student's mentor for the semester. The student teaches the course up to three times under the mentor's supervision establishing a teaching philosophy

- **Villanova University** — Villanova, PA, USA
  M.Sc. in Computer Engineering — *September 2014*

  - Thesis Title: Trading Off Security and Power in Smart Devices for the Internet of Things. GPA: 4.0/4.0
  - Adviser: Dr. Danai Chasaki, Assistant Professor

- **Villanova University** — Villanova, PA, USA
  Cybersecurity Certificate — *September 2014*

  - 5 course graduate certificate program on Cybersecurity. The program covers the major security areas related to the interdependent network of information technology infrastructures, which includes the Internet, telecommunications networks, computer systems, and embedded processors and controllers in critical industries.

- **American University of Science and Technology, AUST** — Beirut, Lebanon
  B.Sc. in Computer and Communications Engineering — *February 2012*

  - Major: Computer and Communications Engineering
  - Thesis Title: Real-Time Application of ADM and DPCM Communication Systems. GPA: 3.92/4.00

- **American University of Science and Technology, AUST** — Beirut, Lebanon
  CISCO Certified Network Associate — *February 2010*

  - CISCO Discovery Tracks (1-4) in Networking

Research Experience

- Current Research

  - Malware analysis and detection for mobile devices and mobile operating systems
  - Design of an SDN security framework for virtual hosts based on power detection and machine learning (1 pending journal article)

- Doctoral Research Experience

  - Conducted research to establish trust and reliability for next generation networks through a layered approach (Results: 1 conference paper and 1 pending journal)
  - Designed a multi-layer security mechanism for embedded systems (Results: 1 conference paper)
  - Designed and implemented a hardware monitoring system for network processors (Results: 2 conference publications and 1 journal article)
  - Designed and implemented a power monitoring system for network processors and modern routers (Results: 2 conference publications and a journal in progress)
  - Co-authored an NSF Proposal for the Design of a Security Framework for Networked Embedded Systems
  - Conducted research in the area of security challenges for the Internet of Things (Results: 1 journal publication)
  - Conducted research for the security of smart grids and advanced metering infrastructure (Results: 1 research paper for a course requirement)

- Masters Research Experience

  - Conducted research for determining encryption strength based on channel conditions in single-hop and multi-hop wireless networks (Results: 2 conference papers and 1 journal publication)
  - Conducted research in traffic analysis for industrial control networks using Modbus and Profinet (Presented a talk about the interesting results)
  - Integration of Evalvid tools into Network Simulator NS-3
  - Conducted research in the area of Software Security: (3 research papers each addressing security at the different phases of the Software Development Life Cycle (SDLC))
  - Conducted research in the area of risk assessment and management: (2 research papers on methods of quantitative risk assessment and qualitative risk assessment)
  - Conducted research in the area of RFID and NFC security: (1 research paper about the security challenges of such systems and how to address those challenges)
  - Conducted research about side channel attacks and countermeasures for trusted computing (Presented a talk and a sample demonstration)
  - Conducted research in the area of routing in satellite networks as a part of networking course

- Undergraduate Research Experience

  - A real-time design for two advanced communications systems: the adaptive delta modulation (ADM) and the differential pulse coded modulation (DPCM) (Results: 2 conference papers)

Speaker/Presenter

- Intelligence Community Forum, ICF 2019, Erie, PA, USA

- International Conference on Ubiquitous Computing and Ambient Intelligence, UCAmI 2017, Villanova, PA, USA

- IEEE International Conference on Computing, Networking and Communications, ICNC 2017, Santa Clara, CA, USA

- IEEE Military Communications Conference, MILCOM 2016 Baltimore, MD, USA

- IEEE International Symposium on Resilient Control Systems, RESWEEK 2015, Philadelphia, PA, USA

- IEEE International Conference on Consumer Electronics, ICCE 2015, Las Vegas, NV, USA

- International Symposium on Advances in Computing, Communications, Security, and Applications, ACSA-14, Jeju Island, South Korea

Invited Talks and Media Appearances

- Guest at "The Insider Show" with Lisa Adams on CBS WSEE/WICU

- Guest at "The Joel Natalie" show on TalkErie.com/WCTL Radio

- Guest at "We Question & Learn" show on NPR WQLN Radio

- Appearances on FOX66 "JET24 News" commenting on Cyber Security incidents

- Appearances on CBS WSEE/WICU "Erie News Now" commenting on Cyber Security incidents

- Invited speaker and presenter on CyberSecurity at the Rotary Club of Erie, Erie, PA, USA

- Invited speaker and presenter on CyberSecurity at the Rotary Club of Buffalo, Buffalo, NY, USA

- Invited speaker and presenter on CyberSecurity at the Rotary Club of Mentor, Mentor, OH, USA

- Invited speaker and presenter on CyberSecurity at Duquesne Club, Pittsburgh, PA, USA

Publications

Journal Papers

Published

- Mansour, Christopher, and Danai Chasaki. "Adaptive security monitoring for next-generation routers." EURASIP Journal on Embedded Systems 2019.1 (2019): 1.

- Mansour, Christopher, and Danai Chasaki. "Identifying Optimal Encryption Effort to Improve Battery Life in Mobile Wireless Devices." International Journal of Research in Wireless Systems 4.1 (2015).

- Chasaki, Danai, and Christopher Mansour. "Security challenges in the internet of things" International Journal of Space-Based and Situated Computing 5.3 (2015): 141-149.

Submitted

- "Power Monitoring to Secure the Next-Generation Internet" submitted to the Journal of Internet Services and Applications

- "Design of an SDN Security Framework for Virtual Hosts" submitted to Journal of Computer Communications

Conference Papers

Published

- C. Mansour and D. Chasaki, "Design of an SDN Security Mechanism to Detect Malicious Activities," 2018 Tenth International Conference on Ubiquitous and Future Networks. ICUFN 2018 (pp. 186-190). IEEE.

- C. Mansour and D. Chadaki, "Multi-layer Security Mechanism for Networked Embedded Devices," 2017 International Conference on Ubiquitous Computing and Ambient Intelligence. UCAmI 2017. Lecture Notes in Computer Science, vol 10586. Springer, Cham (Presenter)

- C. Mansour and D. Chasaki, "Real-time attack and failure detection for next generation networks," 2017 International Conference on Computing, Networking and Communications (ICNC), Santa Clara, CA, 2017, pp. 189-193. doi: 10.1109/ICCNC.2017.7876125 (Presenter)

- C. Mansour and D. Chasaki, "Trust and reliability for next-generation routers," MILCOM 2016 - 2016 IEEE Military Communications Conference, Baltimore, MD, 2016, pp. 740-745. doi: 10.1109/MILCOM.2016.7795417 (Presenter)

- C. Mansour and D. Chasaki, "Power monitoring of highly parallel network processors," 2016 International Conference on Computing, Networking and Communications (ICNC), Kauai, HI, 2016, pp. 1-5. doi: 10.1109/ICCNC.2016.7440713

- C. Mansour, Y. E. H. Shehadeh and D. Chasaki, "Design of an adaptive security mechanism for modern routers," 2015 IEEE International Conference on Consumer Electronics (ICCE), Las Vegas, NV, 2015, pp. 241-244. doi: 10.1109/ICCE.2015.7066397 (Presenter)

- C. Mansour and D. Chasaki, "Power-aware selective encryption of video transmissions in smart devices," 2014 International Wireless Communications and Mobile Computing Conference (IWCMC), Nicosia, 2014, pp. 967-972. doi: 10.1109/IWCMC.2014.6906486

- C. Mansour and D. Chasaki, "Selective encryption of video transmissions over multi-hop wireless networks," 2014 IEEE Symposium on Computers and Communications (ISCC), Funchal, 2014, pp. 1-5. doi: 10.1109/ISCC.2014.6912646

- C. Mansour, R. Achkar and G. A. Haidar, "Simulation of DPCM and ADM Systems," 2012 UKSim 14th International Conference on Computer Modelling and Simulation, Cambridge, 2012, pp. 416-421. doi: 10.1109/UKSim.2012.64

- R. Achkar, G. A. Haidar and C. Mansour, "Real-time application of DPCM and ADM systems," 2012 8th International Symposium on Communication Systems, Networks & Digital Signal Processing (CSNDSP), Poznan, 2012, pp. 1-6. doi: 10.1109/CSNDSP.2012.6292635

Teaching Experience

- Assistant Professor - CIS Department, Mercyhurst University

  - CIS 160 - Introduction to Cyber Security
  - CIS 261 - Information Security
  - CIS 500 - Computing and Information Science Concepts
  - CIS 510 - Algorithm Development
  - CIS 560 - Cyber Networks
  - CIS 564 - Cyber Law and Policy
  - CIS 565 - Systems and Application Security

- Guest Lecturer - Intelligence Studies Department, Mercyhurst University

  - Presented a lecture about multiple aspects of Cyber Security in a Cyber Self Defense course which covers basic Cyber Hygeine

- Guest Lecturer - ECE Department, Villanova University

  - Presented lectures on Software Security, Cryptography and Networks Security, C++, Algorithms and Data Structures for a senior level class

- EGR 9200 Teaching Engineering In Higher Education

  - Presented a lecture explaining the approaches and methods to foster creativity in engineering education and its role in the engineering curriculum.

- Teaching Assistant - ECE Department, Villanova University

  - TA for Fundamentals of Computer Engineering Course and Lab (Level I): Grading homework, quizzes and some exams. Assisting in the lab, implementing experiments, and grading reports
  - TA for Fundamentals of Computer Engineering Course and Lab (Level II): Grading homework, quizzes and some exams. Assisting in the lab, implementing experiments, and grading reports
  - TA for Engineering Programming Applications in C: Grading homework, quizzes and some exams. Assisting in the lab and software development

- Mentor for 3 Villanova undergraduate students helping them during summer research projects

- Teaching Assistant - Faculty of Engineering, American University of Science and Technology (AUST)

  - Courses: Communications Systems, Electronics, Electric Circuits, and Control Systems - Grading homework and quizzes
  - Labs: Electric circuits, Electronics, Microcontroller, Microprocessor, and Control systems - Grading lab reports and troubleshooting experiments

Professional Service

- Workshops Presenter

  - "The Cyber Security Workshop" organized by Erie Regional Chamber Growth Partnership and hosted by Jefferson Educational Society, Erie, PA, USA
  - "From Cyber Risk to Cyber Secure" pilot workshop for executives and board of trustees members at McPC Inc., Cleveland, OH, USA

- Panel Chair for the "Cyber Security Panel" at the "Intelligence Community Forum, 2019", Erie, PA, USA

- Panel Chair for the "Information Management Panel" at the "Intelligence Community Forum, 2019", Erie, PA, USA

- Panelist on the "Intelligence Community Forum - Cyber Track", Erie, PA, USA

- Panelist on the "North Western Pennsylvania Cyber Security Symposium", Erie, PA, USA

- Technical Program Committee Member for The Seventeenth International Conference on Networks, ICN 2020

- Techincal Program Committee Member for The Tenth International Conference on Emerging Networks and Systems Intelligence, EMERGING 2019

- Technical Program Committee Member for The Fourth International Conference on Advances in Computation, Communications and Services, ACCSE 2019

- Technical Program Committee Member for The Eighteenth International Conference on Networks, ICN 2019

- Techincal Program Committee Member for The Tenth International Conference on Emerging Networks and Systems Intelligence, EMERGING 2018

- Technical Program Committee Member for The Third International Conference on Advances in Computation, Communications and Services, ACCSE 2018

- Technical Program Committee Member for The Seventeenth International Conference on Networks, ICN 2018

- Volunteered to help organize and assist for the 2017 Ubiquitous Computing and Ambient Intelligence Conference, UCAmI 2017

- Volunteered to help organize and assist for the 2015 Mid-Atlantic ASEE Conference, Villanova University

- Journal Reviewer

  - Transactions on Emerging Telecommunications Technologies
  - International Journal of Communication Systems

- Conference Proceedings Reviewer

  - IEEE International Conference on Consumer Electronics - Berlin

- Wireless Networks Security Symposium
- Scientific Conference of Computer Sciences
- International Conference on Advances in Computation, Communications and Services
- International Conference on Emerging Networks and Systems Intelligence

Committee Work & Institutional Services

- Mercyhurst's ACM Chapter Founder/Adviser

- Mercyhurst's CIS Weekly Research Seminars Organizer

  - Organizing weekly research seminars where we have CIS faculty and students discuss multiple topics in the areas of data science and cyber security.
  - Hosting multiple speakers giving talks about their work in academia, industry and governments

- Session Chair and Moderator - Villanova University College of Engineering PhD Committee Representative

  - Represented the College of Engineering's PhD committee and chaired/moderated the PhD Proposal Defense and Oral Examination of doctoral candidate Baris Erol (May 2018)
  - Represented the College of Engineering's PhD committee and chaired/moderated the PhD dissertation defense of Dr. Dimitri Karagiannis (April 2018)

- College of Engineering

  - Judge for Freshman Engineering Projects (2014 and 2016)
  - Volunteering organizer and assistant for American Society for Engineering Education Conference (2015)
  - Judge in the USA Regional MATE Underwater Robotics Competition, (Villanova and Rowan Universities, 2014).

- College of Engineering, and The Innovation, Creativity, & Entrepreneurship Institute (Nova-ICE)

  - Intellectual Property Board Member - Engineering Graduate Students Representative

- Founding Member, Vice President and Technology Chair of Center of Engineering and Education Research's Graduate Club (CEER Graduate Club)

  - Organized the CEER Graduate Club Inaugural Poster Competition. Twelve graduate students participated in this competition. The college of engineering sponsored the event, and awards were provided for the first two winners.
  - Participated in meetings with the dean of engineering and the university's associate vice president for research and graduate programs to discuss graduate students needs.
  - Participated in study groups and committees to further advance Villanova as a research fostering environment.

- AUST - Faculty of Engineering

  - Judge and Committee member for the Annual Senior Projects Exposition (May of: 2013, 2015, and 2016)

– Senior projects evaluation committee member (May 2012)

- Founding Member and Adviser for IEEE Student Branch - AUST Zahle Campus

    – Organized technical seminars and talks about technology, networks, and communications. (Spring Term 2012)

Outreach Activities

- Mercyhurst University

    – A Day in Ridge College where potential students learn more about Cyber Security and Data Science Programs
    – Developed multiple learning activities for high school students to learn more about Cyber Security
    – Conducted Cybersecurity and CS workshops for 21st Century Girls Group

- NovaEDGE Engineering Summer High School Program

    – Developed engineering lab experiments in the topics of Computer Engineering and Cybersecurity
    – Developed mini lectures and sample examples for high school students in programming, cybersecurity, and engineering

- Saint Thomas Day of Service

    – As a CEER Graduate Club vice president and active member, we invited our fellow graduate students to participate in a day of service for the community
    – A group of 36 hardworking volunteering graduate students and professors from the College of Engineering helped Chester-Ridley - Crum Watershed Association save over 300 trees that were planted on some streams in Delaware County

Professional Development

- Toastmaster's "Effective Communication for Engineers Workshop", November 15th, 2017

- Arduino Workshop, Villanova University, March 16th 2017

- Software Defined Networking (SDN) for Military Networks Workshop, MILCOM 2016, Baltimore MD, November 1-3, 2016

- Technical Talk Attendee on Information Based Control and Control Communications Complexity, IEEE Philadelphia Section, Villanova University, October 25th, 2016

- Technical Talk Attendee on SoftAir: Software-Defined Networking and Network Function Virtualization Solutions for 5G Cellular Systems, IEEE Philadelphia Section, Temple University, September 7th, 2016

- An Altera University Program Training Workshop: IEEE Philadelphia Section, Drexel University, Bossone Research Center, June 15th, 2016

- Technical Meeting: Collective Phenomena in Complex Networks, IEEE Philadelphia Section, University of Pennsylvania, March 30th, 2016

- Technical Meeting: Systems Engineering Trades in Geolocation: Digital Receiver Design, IEEE Philadelphia Section, Villanova University, October 29th, 2017

Awards & Grants

Awards

- Villanova University College of Engineering Outstanding Graduate Student Award, May 2015

- American University of Sciences and Technology Networking Competition (Ranked 1st), February 2012

Grants

- Travel Grant to attend ACM/IEEE (ANCS 14), Marina Del Rey, California, United States.

- Travel Grant to attend ACM/IEEE (ANCS 13), San Jose, California, United States.

- Travel Grant to attend AFCEA/IEEE 2016 Military Communications Conference (MILCOM 2016), Baltimore, MD, United States

Scholarships

- Recipient of "Grow with Google Challenge Scholarship - Android Basic track"
  Competitive scholarship to learn for free the basics of Android from Google

- Recipient of "One Million Arab Coders: Data Analyst Program Scholarship"
  Competitive scholarship to learn the unique art of Data Analytics for free

- Final Year Dissertation Fellowship
  Competitive fellowship awarded by the College of Engineering to last year PhD candidates working on dissertation. Includes stipend and tuition support. Villanova University

- Masters and Doctoral Assistantships
  Stipend and full tuition support. ECE Department, Villanova University

- Bachelor of Sciences - Tuition Scholarship
  Full tuition for the complete undergraduate degree (renewed yearly based on academic performance). Faculty of Engineering, AUST, Beirut Lebanon

Professional Memberships and Initiatives

- Lebanese Official Orders of Engineers and Architects, Beirut

- ACM Professional Member (2018 - Present)

- ACM Graduate Student Member (2010 - 2018)

- IEEE Graduate Student Member (2009 - 2018)

- IEEE Computer Society Member (2009 - 2018)

Skills

- Languages
  - Arabic (Native) and English
- Programming Languages
  - Java, C++, C, Python, Clojure, ClojureScript, JavaScript, ES-6 Standards, JQuery, JSP, HTML, CSS, PL-SQL, NodeJS, ReactJS, React-Native, Assembly (IA-32, MIPS, 8085, 8086, PIC), VHDL, and Verilog
  - Frameworks: Struts, iBatis, Springs, and MVC frameworks
  - Simulators: Quartus, Xilinx-ISE, Leonardo Spectrum, Network Simulator (NS-3), Click Modular Router, Cisco Packet Tracer, PSpice, and Mininet

References

1 - Afzal Upal, Ph.D
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2 - Duncan McGill, Ph.D
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3 - Danai Chasaki, Ph.D
Primary adviser during my Masters and PhD studies
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4 - Sriram Natarajan, Ph.D

PhD committee member

Network Engineering (SDN) at Google

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5 - Richard Perry, Ph.D

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6 - James Solderitsch, Ph.D

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7 - Gerard F. Jerry Jones, Ph.D

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Professor

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