Curriculum Vitae of Irfan Ahmed

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RESEARCH INTERESTS

Digital Forensics
System Security
Malware Detection and Analysis
Cyber-Physical Systems (CPS)
Industrial Control System (ICS) Security
Additive Manufacturing/3D Printing Security
Cybersecurity Education

CURRENT PROFESSIONAL AFFILIATIONS

Associate Professor (tenured) July 2021 - To-date
Assistant Professor (tenure-track) August 2018 - June 2021
Department of Computer Science `www.egr.vcu.edu/departments/computer/`
College of Engineering `https://egr.vcu.edu`
Virginia Commonwealth University (VCU), Richmond, VA

Director, Security and Forensics Engineering (SAFE) Lab August 2018 - To-date
Department of Computer Science `https://safe.lab.vcu.edu`
Virginia Commonwealth University (VCU), Richmond, VA

Faculty Fellow August 2018 - To-date
VCU Cybersecurity Center, Richmond, VA `https://cybersecurity.vcu.edu`

DHS ICSJWG Steering Team (IST) Member Jan 2022 - To-date
Industrial Control Systems Joint Working Group (ICSJWG)
US Department of Homeland Security (DHS) Cybersecurity and Infrastructure Security Agency (CISA)
`https://www.cisa.gov/uscert/ics/Industrial-Control-Systems-Joint-Working-Group-ICSJWG`

Memberships
Senior Member, IEEE (Institute of Electrical and Electronics Engineers)
Member, IEEE Computer Society Technical Committee on Security and Privacy
Member, IEEE Technical Committee on Cyber-Physical Systems
Member, American Academy of Forensic Sciences (AAFS) - `www.aafs.org`
Member, DHS Industrial Control Systems Joint Working Group (ICSJWG)
Member, ACM (Association for Computing Machinery)
Member, ACM Special Interest Group on Security, Audit and Control (SIGSAC)
Member, ACM Special Interest Group on Computer Science Education (SIGCSE) - `sigcse.org/sigcse`
Member, ACM Emerging Interest Group on Smart Cities and Communities
Member, Laboratories and Educators Alliance Program (LEAP), joint effort between the American Society of Crime Lab Directors (ASCLD) and the Council of Forensic Science Educators (COFSE)
Member, Council of Forensic Science Educators (COFSE). `https://www.cofse.org`

PREVIOUS PROFESSIONAL AFFILIATIONS

Canizaro-Livingston Endowed Assistant Professor in Cybersecurity August 2017 - July 2018

Department of Computer Science — www.cs.uno.edu
University of New Orleans

Assistant Professor (tenure-track) — August 2013 - July 2018
Department of Computer Science — www.cs.uno.edu
University of New Orleans

Director, Cyber-Physical Systems (CyPhy) Lab — August 2015 - July 2018
Department of Computer Science — cyphy.cs.uno.edu
University of New Orleans

Associate Director — January 2017 - July 2018
Research Affiliation — January 2012 - July 2018
Greater New Orleans Center for Information Assurance (GNOCIA) — gnocia.cs.uno.edu
University of New Orleans

Advisory Board Member of Cybersecurity — June 2018 - May 2022
Sacred Heart University, Fairfield, CT — www.sacredheart.edu

PROFESSIONAL PREPARATION

Postdoctoral Research Associate (Postdoc) — Jan 2012-Aug 2013
University of New Orleans, New Orleans, LA, United States
http://www.uno.edu
Project: Virtual Machine Introspection-based Live Forensics for Detection of Malicious Software
Funded by: National Science Foundation (Award No.: 1016807)

Postdoctoral Research Associate (Postdoc) — Sept 2010-Sept 2011
Queensland University of Technology, Brisbane, Australia
http://www.qut.edu.au
Project: Forensic Readiness in Control Systems: Tools and Methods
Funded by: Department of Prime Minister and Cabinet's Research Support for National Security

Doctor of Philosophy (PhD), Computer Science — June 2010
Ajou University, Suwon, South Korea
http://www.ajou.ac.kr

Master of Science (M.S.), Computer Science — April 2005
SZABIST, Karachi, Pakistan
http://szabist.edu.pk

Bachelor of Engineering (B.E.), Computer System — Feb 2003
NED University of Engineering and Technology, Karachi, Pakistan
http://www.neduet.edu.pk

Oracle Certified Professional (OCP), Database Administration — May 2001
http://www.oracle.com/education/professional.html

HONORS AND AWARDS

Best Paper Award March 2022
9^{th} Annual Digital Forensics Research Conference Europe (DFRWS EU'22), University of Oxford, Oxford, United Kingdom

Best Student Paper Award March 2022
9^{th} Annual Digital Forensics Research Conference Europe (DFRWS EU'22), University of Oxford, Oxford, United Kingdom

Best Poster Award September 2021
8^{th} Annual Women in Cybersecurity (WiCyS) Conference, Denver, CO

Best Student Paper Award July 2020
20^{th} Annual Digital Forensics Research Conference (DFRWS'20), USA

ORAU Ralph E. Powe Junior Faculty Enhancement Award May 2019
Oak Ridge Associated Universities (ORAU)
`https://www.orau.org/news/releases/2019/2019-powe-winners.html`

Canizaro-Livingston Endowed Professorship in Cybersecurity August 2017
University of New Orleans, New Orleans, LA

Early Career Research Prize December 2016
University of New Orleans, New Orleans, LA
`http://new.uno.edu/research/research-council/awards`
(A university-level award given only to one junior faculty member each year based-on the achievements in teaching, research, and service.)

Outstanding Poster Award March 2016
With my PhD Student, Aisha Ali-Gombe
6^{th} ACM Conference on Data and Application Security and Privacy (CODASPY'16), New Orleans, LA

Outstanding Research Award February 2014
66^{th} Annual Meeting of the American Academy of Forensic Sciences, Washington, USA

Best Paper Award November 2013
16^{th} Information Security Conference (ISC'13), Dallas, Texas, USA

Best Paper Award August 2011
International Cyber Resilience Conference, Perth, Australia

Korean Government Scholarship Sept 2006 - Aug 2010
Institute of Information Technology Advancement (IITA), South Korea

Ajou University Full Tuition Scholarship Sept 2006 - Aug 2008
Ajou University, South Korea

Silver Medalist 1993
23^{rd} International Art Exhibition, Tokyo, Japan

INITIATIVES AND ACHIEVEMENTS

Created Cyber4n6, an industry-focused experiential learning program with Virginia State Police 2023

Funded by Virginia Commonwealth Cyber Initiative (CCI)
https://www.people.vcu.edu/~iahmed3/cyber4n6.html

Established an annual fully-funded GenCyber cybersecurity summer bootcamp at VCU 2022
Funded by NSA/NSF targeting JROTC middle and early high school students
https://gencyber.vcu.edu/

Led VCU to join the U.S. Cyber Command's Academic Engagement Network 2022
United States Cyber Command (USCYBERCOM)
https://www.cybercom.mil/Partnerships-and-Outreach/Academic-Engagement/

Led an Education Partnership Agreement (EPA) between the DoD DC3 and VCU 2021
The Department of Defense Cyber Crime Center (DC3) for excellence in digital forensics
https://www.dc3.mil/

Led the effort of achieving the DHS/NSA CAE-R designation at VCU 2020
DHS/NSA National Center for Academic Excellence in Research (CAE-R)
https://www.caecommunity.org/cae-map

One of the First Ten Contributors to the National Cybersecurity Curriculum Mar 2017- Dec 2018
National Security Agency (NSA)'s National Cybersecurity Curriculum Program (NCCP)
(Endorsed by the NSA program manager to the Dean of College of Engineering at VCU)
https://clark.center/home

Created a fully functional small-scale industrial control system (ICS) testbed at UNO 2016
Funded by the Army Research Office (ARO) to promote university research in ICS security

SOFTWARE/HARDWARE VULNERABILITY DISCLOSURE

- CVE-2021-32980, Automation Direct CLICK PLC,
  https://us-cert.cisa.gov/ics/advisories/icsa-21-166-02
- CVE-2021-32984, Automation Direct CLICK PLC,
  https://us-cert.cisa.gov/ics/advisories/icsa-21-166-02
- CVE-2021-32986, Automation Direct CLICK PLC,
  https://us-cert.cisa.gov/ics/advisories/icsa-21-166-02
- CVE-2021-32982, Automation Direct CLICK PLC,
  https://us-cert.cisa.gov/ics/advisories/icsa-21-166-02
- CVE-2021-32978, Automation Direct CLICK PLC,
  https://us-cert.cisa.gov/ics/advisories/icsa-21-166-02
- CVE-2021-32926, Rockwell Automation Micro800 and MicroLogix 1400 PLCs,
  https://us-cert.cisa.gov/ics/advisories/icsa-21-145-02
- CVE-2020-15791, Siemens S7-300 and S7-400 PLCs,
  https://cert-portal.siemens.com/productcert/pdf/ssa-381684.pdf
- CVE-2018-7790, Schneider Electric Modicon M221 PLC,
  https://ics-cert.us-cert.gov/advisories/ICSA-18-240-01
- CVE-2018-7791, Schneider Electric Modicon M221 PLC,
  https://ics-cert.us-cert.gov/advisories/ICSA-18-240-01
- CVE-2018-7792, Schneider Electric Modicon M221 PLC,
  https://ics-cert.us-cert.gov/advisories/ICSA-18-240-01

TEACHING

Term	Level	Course Number	Course Name	Class Size	Evaluation
University of New Orleans					
Spring'13	U,G	CSCI 4621/5621	Introduction to Computer Security	21	4.64 / 5.00
Fall'13	U,G	CSCI 4311/5311	Computer Networks	26	4.13 / 5.00
Spring'14	U,G	CSCI 4311/5311	Computer Networks	23	N/A
Fall'14	U,G	CSCI 4401/5401	Operating System	37	4.71 / 5.00
Fall'14	U,G	CSCI 4621/5621	Introduction to Computer Security	33	4.88 / 5.00
Spring'15	U,G	CSCI 4311/5311	Computer Networks	45	N/A
Spring'15	U,G	CSCI 4621/5621	Introduction to Computer Security	34	N/A
Fall'15	G	CSCI 6627	Industrial Control System Security	38	4.91 / 5.00
Fall'15	U,G	CSCI 4621/5621	Introduction to Computer Security	26	4.95 / 5.00
Spring'16	G	CSCI 6627	Industrial Control System Security	19	4.45 / 5.00
Spring'16	G	CSCI 6621	Topics in Network Security and Forensics	20	4.56 / 5.00
Fall'16	U,G	CSCI 4623/5623	Introduction to Computer Forensics	15	4.89 / 5.00
Fall'16	U,G	CSCI 4621/5621	Introduction to Computer Security	25	4.42 / 5.00
Spring'17	G	CSCI 6627	Industrial Control System Security	14	4.72 / 5.00
Spring'17	G	CSCI 6621	Topics in Network Security and Forensics	10	4.71 / 5.00
Fall'17	U,G	CSCI 4621/5621	Introduction to Computer Security	35	4.78 / 5.00
Spring'18	U,G	CSCI 4621/5621	Introduction to Computer Security	48	4.56 / 5.00
Virginia Commonwealth University					
Fall'18	U	CMSC 414	Computer and Network Security	7	4.50 / 5.00
Spring'19	U	CMSC 414	Computer and Network Security	56	3.47 / 5.00
Fall'19	*No Teaching*				
Spring'20	U	CMSC 414	Computer and Network Security	34	3.75 / 5.00
Fall'20	G	CMSC 654	Memory and Malware Forensics	8	4.57 / 5.00
Spring'21	U	CMSC 414	Computer and Network Security	41	4.08 / 5.00
Fall'21	G	CMSC 654	Memory and Malware Forensics	6	4.33 / 5.00
Spring'22	U	CMSC 414	Computer and Network Security	48	3.83 / 5.00
Fall'22	G	CMSC 654	Memory and Malware Forensics	15	/ 5.00

U ← Undergraduate-level
G ← Graduate-level

FUNDED GRANTS/CONTRACTS

Total Funding: $5,732,156 (Approx. $5.73 Million)
My Share: $3,262,218 (Approx. $3.26 Million)
(Lead/Sole/Institute) PI: $2,416,818 (Approx. $2.42 Million)
Co-PI: $845,400 (Approx. $0.85 Million)

	DHS	NSF	NSA	DOE	ARO	ONR	VA-CCI	LA-BoR	UNO	ORAU
Projects	2	6	8	1	1	1	6	4	7	1
Total Funds ($)	350,000	2,222,366	1,731,091	50,000	96,310	80,000	721,389	344,500	126,500	10,000
My Share ($)	250,000	1,050,000	919,908	50,000	96,310	24,000	391,000	344,500	126,500	10,000

- Department of Homeland Security (DHS)
- National Science Foundation (NSF)
- National Security Agency (NSA)
- United States Department of Energy (DOE)
- Army Research Office (ARO)
- Office of Naval Research (ONR)

- Virginia Commonwealth Cyber Initiative (VA-CCI)
- Louisiana State Board of Regents (LA-BoR)
- University of New Orleans (UNO)
- Oak Ridge Associated Universities (ORAU)

*Principal Investigator (PI)
*Co-Principal Investigator (Co-PI)

Research

- **[DOE].** "CyManII Cyber Vulnerability Research", Department of Energy (DOE) Cybersecurity Manufacturing Innovation Institute (CyManII), Role: Sole-PI, Total Funding: $50,000, **My Share: $50,000**, Project Duration: 1 year
- **[VA-CCI].** "Cybersecurity Initiative in Bioprinting", Virginia Commonwealth Cyber Initiative (CCI), Role: Co-PI (with Nastassja Lewinski from VCU), Total Funding: $100,000 (all direct cost), **My Share: $50,000**, Project Duration: 1 year (Sept 2022 - Aug 2023)
- **[NSF].** "OAC Core: Small: MedKnights - Towards Secure and Flexible Medical IoT (IoMT) Infrastructure using Generative Adversarial Networks", National Science Foundation (NSF), Role: Co-PI (with Tamer Nadeem from VCU), Total Funding: $599,924, **My Share: $223,864**, Project Duration: 3 years (2022-2025), *Award No.: 2212424*
- **[DHS].** "Digital Forensic Tools and Techniques for Investigating Control Logic Attacks in Industrial Control Systems", DHS Criminal Investigations and Network Analysis (CINA) Center, Role: Sole PI, Total Funding: $150,000, **My Share: $150,000**, Project Duration: 1 year and 4 months (2022-2023)
- **[NSA].** "Machine Learning-Based Entity Fingerprinting", National Security Agency (NSA), Role: Institute PI (with Aisha Ali-Gombe from Towson University), Total Funding: $483,226, **My Share: $239,908**, Project Duration: 2 years (2021 - 2023)
- **[VA-CCI].** "Spatiotemporal G-code Modeling for Additive Manufacturing Security", Virginia Commonwealth Cyber Initiative (CCI), Role: Institute PI (with Robert J. Prins from James Madison University), Total Funding: $176,389 (all direct cost), **My Share: $121,000**, Project Duration: 1 year and 6 months (Jan 2021 - June 2022)
- **[DHS].** "Data Science-integrated Experiential Digital Forensics Training based-on Real-world Case Studies of Cybercrime Artifacts", DHS Criminal Investigations and Network Analysis (CINA) Center, Role: Lead PI (with Kostadin Damevski from VCU), Total Funding: $200,000, **My Share: $100,000**, Project Duration: 2 year (2022-2024)
- **[VA-CCI].** "Digital Forensics Experiential Learning Program with Virginia State Police", Virginia Commonwealth Cyber Initiative (CCI), Role: Sole PI, Total Funding: $100,000 (all direct cost), **My Share: $100,000**, Project Duration: 1 year and three months (2022 - 2023)
- **[NSF].** "CyberTraining: Implementation: Small: Using Problem-Based Learning for Vocational Training in Cyberinfrastructure Security at Community Colleges", National Science Foundation (NSF) CyberTraining, Role: Lead-PI (with Sajal Bhatia from Sacred Heart University), Total Funding: $499,661, **My Share: $250,000**, Project Duration: 3 years (2020 - 2023), *Award No.: 2017337*
- **[VA-CCI].** "Control Logic Attacks and Defenses for Electric Vehicle Charging Stations", Virginia Commonwealth Cyber Initiative (CCI), Role: Institute PI (with Joseph Shelton from Virginia State University and Kevin Heaslip from Virginia Tech), Total Funding: $125,000 (all direct cost), **My Share: $50,000**, Project Duration: 1 year (2021 - 2022)
- **[NSF].** "EDU: Collaborative: Using Virtual Machine Introspection for Deep Cyber Security Education", National Science Foundation (NSF) - Secure & Trustworthy Cyberspace (SaTC), Role: PI (with Zhiqiang Lin from The Ohio State University), Total Funding: $299,913, **My Share: $150,000**, Project Duration: 4 years (2016 - 2020), *Award No.: 1623276*
- **[NSF].** "SaTC-EDU: EAGER: Peer Instruction for Cybersecurity Education", National Science Foundation (NSF) - Secure & Trustworthy Cyberspace (SaTC), Role: PI (Co-PIs: Cynthia B. Lee

from Stanford University and Golden G. Richard III and Vassil Roussev from UNO), Total Funding: $300,000, **My Share: $250,000**, Project Duration: 4 years (2015 - 2019)), *Award No.: 1500101*

- **[VA-CCI].** "Virtual PLC Platform for Threat Intelligence in Industrial Control Systems", Virginia Commonwealth Cyber Initiative (CCI), Role: Sole PI, Total Funding: $20,000 (all direct cost), **My Share: $20,000**, Project Duration: 1 year (2021 - 2022)
- **[VA-CCI].** "CCI Smart Cities: Cyber and Physically Secure Communities: Resilient, Sustainable, Energy Efficient", Virginia Commonwealth Cyber Initiative (CCI), Role: Co-PI (with Milos Manic, Eyuphan Bulut, and Changqing Luo from VCU), Total Funding: $200,000 (all direct cost), **My Share: $50,000**, Project Duration: 1 year (2020 - 2021)
- **[ORAU].** "A Virtual PLC Framework for Control Logic Forensics in Industrial Control System", Oak Ridge Associated Universities (ORAU) Ralph E. Powe Junior Faculty Enhancement Award, Role: Sole-PI, Total Funding: $10,000, **My Share: $10,000**, Project Duration: 1 year (June 2019 - May 2020)
- **[NSA].** "Automated Platform for Comprehensive Hands-on Cybersecurity Training", National Security Agency, Role: Co-PI (with Vassil Roussev), Total Funding: $274,370, **My Share: $140,000**, Project Duration: 1 year (2017 - 2018)
- **[NSA].** "Portable Hands-on Training Environment for SCADA Security", National Security Agency, Role: PI (Co-PI: Vassil Roussev), Total Funding: $280,310, **My Share: $150,000**, Project Duration: 1 year (2017 - 2018)
- **[NSA].** "Instructional Material for SCADA Security Course", National Security Agency, Role: PI (Co-PI: Vassil Roussev from UNO and Sajal Bhatia from Fordham University), Total Funding: $187,964, **My Share: $100,000**, Project Duration: 1 year (2017 - 2018)
- **[NSA].** "Concept Maps for Cybersecurity Education", National Security Agency, Role: PI (Co-PI: Vassil Roussev), Total Funding: $163,803, **My Share: $100,000**, Project Duration: 1 year (2017 - 2018)
- **[UNO].** "Towards Programmable Logic Controller Forensics", UNO Office of Research and Sponsored Programs (ORSP) - SCoRe (Stimulating Competitive Research), University of New Orleans, Role: Sole PI, Total Funding: $15,000, **My Share: $15,000**, Project Duration: 1 year (January 2018 - February 2019)
- **[UNO].** "Gap Analysis of Digital Forensics on SCADA Testbed", UNO Office of Research and Sponsored Programs (ORSP) - SCoRe (Stimulating Competitive Research), University of New Orleans, Role: Sole PI, Total Funding: $12,000, **My Share: $12,000**, Project Duration: 1 year (July 2016 - June 2017)
- **[ONR].** "Digital Forensic Toolkit for Machine Control Systems (TRACE)", Office of Naval Research - STTR Phase 1, Role: PI (with Intelligent Automation Inc.), Total Funding: $80,000, **My Share: $24,000**, Project Duration: 7 Months (2016-2017)
- **[UNO].** "UNO ORSP for Early Career Research Prize", University of New Orleans, Role: Sole PI, Total Funding:$7,500, **My Share: $7,500**, Project Duration: 1 Year (2016-2017)
- **[UNO].** "Fuzzing Infrastructure for the Cloud", UNO ORSP Internal Grant Program funded by the Louisiana Working and Innovation for a Stronger Economy (WISE) initiative, Role: Sole PI, Total Funding: $20,000, **My Share: $20,000**, Project Duration: 8 Months (2015 - 2016)
- **[NSA].** "Automatic Run-time Mitigation of Kernel Exploits in Cloud Environments", National Security Agency, Role: PI (Co-PIs: Vassil Roussev and Golden G. Richard III), Total Funding: $75,000, **My Share: $50,000**, Project Duration: 1 year (2015 - 2016)
- **[BoR RCS].** "Towards Effective Vulnerability Analysis of Application Code in a Cloud-computing Environment", LA Board of Regents (BoR) - Research Competitiveness Subprogram (RCS), Role: Sole PI, Total Funding: $146,700, **My Share: $146,700**, Project Duration: 3 years (2015 - 2018) Award No.: LEQSF(2015-18)-RD-A-34 *(awarded, but due to LA state budget cut, not funded)*

- **[NSF].** "CNS-SaTC: EAGER: Integrating Cognitive and Computer Science to Improve Cyber Security: Selective Attention and Personality Traits for the Detection and Prevention of Risk", National Science Foundation (NSF) - Secure & Trustworthy Cyberspace (SaTC), Role: PI since January 2017 and Co-PI from 2014 to 2016 (with Carl Weems from Iowa State University and Golden G. Richard III from UNO), Total Funding: $223,022, **My Share: $100,000**, Project Duration: 4 years (2014 - 2018), *Award No.: 1358723*
- **[UNO].** "Botnet Detection in Cloud-computing Environments", UNO Office of Research and Sponsored Programs (ORSP) - SCoRe (Stimulating Competitive Research), University of New Orleans, Role: Sole PI, Total Funding: $12,000, **My Share: $12,000**, Project Duration: 3 months (May 2014 - Aug 2014)
- **[NSF].** "EDU: Lightweight Environment for Network Security Education (LENSE)", National Science Foundation (NSF) - Secure & Trustworthy Cyberspace (SaTC), Role: Co-PI (with Vassil Roussev and Golden G. Richard III), Total Funding: $299,846, **My Share: $50,000**, Project Duration: 3 years (2014 - 2017), *Award No.: 1419358*

Planning

- **[NSF].** "IUCRC Planning Grant VCU: Center for Wireless Innovation towards Secure, Pervasive, Efficient and Resilient Next G Networks (WISPER)", National Science Foundation (NSF), Role: Co-PI (with Erdem Topsakal, Eyuphan Bulut, and Tamer Nadeem), Total Funding: $20,000, Project Duration: 1 year (2022 - 2023), *Award No.: 2209902*

Equipment

- **[BoR].** "UNO CyberRange: An Advanced Platform for Cybersecurity Workforce Training", LA Board of Regents (BoR) Departmental Enhancement, Role: Co-PI (with Vassil Roussev and Minhaz Zibran), Total Funding: $195,400, Project Duration: 1 year (2018 - 2019)
- **[ARO].** "SCADA Testbed for Security and Forensics Research", Army Research Office (ARO) - Defense University Research Instrumentation Program (DURIP), Role: PI (Co-PIs: Golden G. Richard III and Vassil Roussev), Total Funding: $96,310, Project Duration: 1 year (2015 - 2016)

Outreach

- **[NSA].** "GenCyber Bootcamp for JROTC Middle and Early High-school Students", National Security Agency, Role: PI (Co-PI: Ahmet Sonmez), Total Funding: $150,000, **My Share: $130,000**, Project Duration: 2 year (2021 - 2023)
- **[NSA].** "GenCyber@UNO: An Intensive Cybersecurity Bootcamp for Secondary School Teachers", Joint funding of National Security Agency & National Science Foundation, Role: Co-PI (with Vassil Roussev), Total Funding: $116,418, **My Share: $10,000**, Project Duration: 1 year (2017 - 2018)

Others

- **[UNO].** Total Fundingg:$50,000, **My Share: $50,000** from UNO Foundation for ICS Equipment in 2016
- **[BoR].** "Travel Grants for Emerging Faculty (TGEF)", Board of Regents - Louisiana, Total Funding: $1200, **My Share: $1200**, 2016
- **[UNO].** Total Funding:$10,000, **My Share: $10,000** from UNO CS Department for Equipment (PLC Trainers) in 2015
- **[BoR].** "Travel Grants for Emerging Faculty (TGEF)", Board of Regents - Louisiana, Total Funding: $1200, **My Share: $1200)**, 2014

COMMERCIALIZATION AND PATENTS

- **Company Name:** VirtualPLC LLC
  Co-Founders: Irfan Ahmed, and Syed Ali Qasim
  Product: Virtual programmable logic controllers (PLCs) for threat intelligence
  Seed Funding: Virginia Commonwealth Cyber Initiative (CCI)

PEER-REVIEWED PUBLICATIONS

- **[IEEE CSR].** Nauman Zubair, Adeen Ayub, Hyunguk Yoo, **Irfan Ahmed**, "Control Logic Obfuscation Attack in Industrial Control Systems", In IEEE International Conference on Cyber Security and Resilience (IEEE CSR'22), July 2022. *(held virtually)*
- **[DFRWS US].** Megan Davis, Bridget McInnes, **Irfan Ahmed**, "Forensic Investigation of Instant Messaging Services on Linux OS: Discord and Slack as Case Studies", In the 22^{nd} Annual Digital Forensics Research Conference (DFRWS US'22), July 2022. *(held virtually)*
  (Acceptance rate (30%): 13 out of 43 submissions)
- **[ICCIP].** Muhammad Haris Rais, Muhammad Ahsan, Vaibhav Sharma, Radhika Barua, Rob Prins, **Irfan Ahmed**, "Low-magnitude Infill Structure Manipulation Attacks on FFF-based 3D Printers", In the 16^{th} IFIP International Conference on Critical Infrastructure Protection (ICCIP), March 2022, Arlington, Virginia. *(held virtually)*
- **[DFRWS EU].** Nauman Zubair, Adeen Ayub, Hyunguk Yoo, **Irfan Ahmed**, "PEM: Remote Forensic Acquisition of PLC Memory in Industrial Control Systems", In the 9^{th} Annual Digital Forensics Research Conference Europe (DFRWS EU'22), March 2022, Oxford, United Kingdom
  (Best Paper Award)
  (Acceptance rate (32.5%): 13 out of 40 submissions)
- **[DFRWS EU].** Muhammad Haris Rais, Rima Asmar Awad, Juan Lopez Jr., **Irfan Ahmed**, "Memory Forensic Analysis of a Programmable Logic Controller in Industrial Control Systems", In the 9^{th} Annual Digital Forensics Research Conference Europe (DFRWS EU'22), March 2022, Oxford, United Kingdom
  (Best Student Paper Award)
  (Acceptance rate (32.5%): 13 out of 40 submissions)
- **[IEEE Access].** Shresht Bhatia, Sajal Bhatia, **Irfan Ahmed**, "Automated Waterloo Rubric for Concept Map Grading", In IEEE Access Journal, 2021
  (Impact Factor: 3.75 in 2021)
- **[IEEE Access].** Masrik Dahir, Syed Ali Qasim, **Irfan Ahmed**, "Cronus: An Automated Feedback Tool for Concept Maps", In IEEE Access Journal, August 2021
  (Impact Factor: 3.75 in 2021)
- **[J. Additive Manufacturing].** Muhammad Haris Rais, Ye Li, **Irfan Ahmed**, "Dynamic-thermal and Localized Filament-kinetic Attacks on Fused Filament Fabrication based 3D Printing Process", In the Additive Manufacturing Journal, Elsevier, July 2021
  (Impact Factor: 11.00 in 2021)
- **[DFRWS].** Muhammad Haris Rais, Rima Asmar Awad, Juan Lopez Jr., **Irfan Ahmed**, "JTAG-based PLC Memory Acquisition Framework for Industrial Control Systems", In the 21^{st} Annual Digital Forensics Research Conference (DFRWS'21), July 2021. *(held virtually)*
  (Acceptance rate (36%): 16 out of 44 submissions)
- **[WOOT].** Adeen Ayub, Hyunguk Yoo, **Irfan Ahmed**, "Empirical Study of PLC Authentication Protocols in Industrial Control Systems", In the 15^{th} IEEE Workshop on Offensive Technologies (WOOT'21), co-located with the 42^{nd} IEEE Symposium on Security and Privacy and in cooperation with Usenix, San Francisco, CA, May 2021 *(held virtually)*

(Resulted in seven CVEs: CVE-2021-32980, CVE-2021-32984, CVE-2021-32986, CVE-2021-32982, CVE-2021-32978, CVE-2021-32926, and CVE-2020-15791)
(Acceptance rate (35%): 12 out of 34 submissions)

- **[ICCPS].** Muhammad Haris Rais, Ye Li, **Irfan Ahmed**, "Spatiotemporal G-code Modeling for Secure FDM-based 3D Printing", In the 12^{th} ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS), May 2021, Nashville, TN. *(held virtually)*
(Acceptance rate (26%): 20 out of 77 submissions)
- **[ICCIP].** Syed Ali Qasim, Adeen Ayub, Jordan Johnson, **Irfan Ahmed**, "Attacking IEC-61131 Logic Engine in Programmable Logic Controllers in Industrial Control Systems", In the 15^{th} IFIP International Conference on Critical Infrastructure Protection (ICCIP), March 2021, Arlington, Virginia. *(held virtually)*
(CVEs to be assigned)
- **[MAKE].** Manish Bhatt, Avdesh Mishra, Sharon Gatto, Rishav Rajendra, Md Tamjidul Hoque, **Irfan Ahmed**, "Hierarchical based File Fragment Classification", Journal of Machine Learning and Knowledge Extraction (MAKE), MDPI, August 2020
- **[DFRWS].** Syed Ali Qasim, Jared Smith, **Irfan Ahmed**, "Control Logic Forensics Framework using Built-in Decompiler of Engineering Software in Industrial Control Systems", In the 20^{th} Annual Digital Forensics Research Conference (DFRWS'20), July 2020, Memphis, TN. *(held virtually)*
(Best Student Paper Award)
- **[ISC].** Syed Ali Qasim, Juan Lopez Jr., **Irfan Ahmed**, "Automated Reconstruction of Control Logic for Programmable Logic Controller Forensics", In the 22^{nd} Information Security Conference (ISC'19), September 2019, New York.
(Acceptance rate (26.7%): 23 out of 86 submissions)
- **[INTERPOL].** Vassil Roussev, **Irfan Ahmed**, "Cloud Forensics - A True Game Changer", INTERPOL Digital 4N6 Pulse, Volume: V, June 2019
- **[CISSE].** Mandar Shivapurkar, Sajal Bhatia, **Irfan Ahmed**, "Problem-based Learning for Cybersecurity Education", In the 23^{rd} Colloquium for Information Systems Security Education (CISSE'19), June 2019, Las Vegas, NV.
- **[IFIP SEC].** Hyunguk Yoo, **Irfan Ahmed**, "Control Logic Injection Attacks on Industrial Control Systems", In 34^{th} IFIP International Conference on Information Security and Privacy Protection (IFIP SEC'19), June 2019, Lisbon, Portugal.
(Resulted in three CVEs: CVE-2018-7790, CVE-2018-7791, and CVE-2018-7792)
(Acceptance rate (18%): 26 out of 142 submissions)
- **[DIMVA].** Hyunguk Yoo, Sushma Kalle, Jared Smith, **Irfan Ahmed**, "Overshadow PLC to Detect Remote Control-Logic Injection Attacks", In 16^{th} SIG SIDAR Conference on Detection of Intrusions and Malware & Vulnerability Assessment (DIMVA'19), June 2019, Gothenburg, Sweden.
(Acceptance rate (28%): 23 out of 80 submissions)
- **[NDSS BAR].** Sushma Kalle, Nehal Ameen, Hyunguk Yoo, **Irfan Ahmed**, "CLIK on PLCs! Attacking Control Logic with Decompilation and Virtual PLC", In Binary Analysis Research (BAR) Workshop in Conjunction with Network and Distributed System Security Symposium (NDSS), Feb 2019, San Diego, CA.
- **[SIGCSE].** Pranita Deshpande, **Irfan Ahmed**, "Topological Scoring of Concept Maps for Cybersecurity Education", In 50^{th} ACM Technical Symposium on Computer Science Education (SIGCSE), February 2019, Minneapolis, Minnesota, USA.
(Acceptance rate (32%): 169 out of 526 submissions)
- **[SIGCSE].** Pranita Deshpande, Cynthia Lee, **Irfan Ahmed**, "Evaluation of Peer Instruction for Cybersecurity Education", In 50^{th} ACM Technical Symposium on Computer Science Education (SIGCSE), February 2019, Minneapolis, Minnesota, USA.
(Acceptance rate (32%): 169 out of 526 submissions)

- **[PLOS ONE].** Carl Weems, **Irfan Ahmed**, Golden G. Richard III, Justin Russell, Erin Neill, "Susceptibility and Resilience to Cyber Threat: Findings from a Scenario Decision Program to Measure Secure and Insecure Computing Behavior", PLOS ONE, Dec 2018
(Impact Factor: 2.76 in 2018)
- **[Book Chapter].** Sajal Bhatia, Sunny Behal, **Irfan Ahmed**, "Distributed Denial of Service Attacks and Defense Mechanism: Current Landscape and Future Directions", In Advances in Information Security Series, Conti, Somani, and Poovendran (Eds.), Springer, 2018.
- **[Book Chapter]. Irfan Ahmed**, Vassil Roussev, "Analysis of Cloud Digital Evidence", In Security, Privacy, and Digital Forensics in the Cloud, L. Chen, and H. Takabi (Eds.), IGI Global, 2018.
- **[IEEE S&P]. Irfan Ahmed**, Vassil Roussev, "Peer Instruction Teaching Methodology for Cybersecurity Education", IEEE Security & Privacy, Vol. 16, No. 4, July 2018.
(Impact Factor: 1.382 in 2018)
- **[DFRWS].** Manish Bhatt, **Irfan Ahmed**, "Leveraging Relocations in Kernel ELF-binaries for Linux Kernel Version Identification", In the 18^{th} Annual Digital Forensics Research Conference (DFRWS'18), July 2018, Providence, RI, USA.
(Acceptance rate (31%): 14 out of 44 submissions)
- **[CODASPY].** Saranyan Senthivel, Shrey Dhungana, Hyunguk Yoo, **Irfan Ahmed**, Vassil Roussev, "Denial of Engineering Operations Attacks in Industrial Control Systems", In 8^{th} ACM Conference on Data and Application Security and Privacy (CODASPY'18), March 2018, Tempe, AZ.
(Acceptance rate (21%): 23 out of 110 submissions)
- **[SIGCSE].** Manish Bhatt, **Irfan Ahmed**, Zhiqiang Lin, "Using Virtual Machine Introspection for OS Kernel Security Education", In 49^{th} ACM Technical Symposium on Computer Science Education (SIGCSE), February 2018, Baltimore, Maryland, USA.
(Acceptance rate (35%): 161 out of 459 submissions)
- **[IEEE S&P]. Irfan Ahmed**, Sebastian Obermeier, Sneha Sudhakaran, Vassil Roussev, "Programmable Logic Controller Forensics", IEEE Security & Privacy, Vol. 15, No. 6, Nov 2017.
(Impact Factor: 1.38 in 2017)
- **[WISA].** Jonathan Grimm, **Irfan Ahmed**, Vassil Roussev, Manish Bhatt, ManPyo Hong, "Automatic Mitigation of Kernel Rootkits in Cloud Environments", In the 18^{th} World Conference on Information Security Applications (WISA'17), Lecture Notes in Computer Science (LNCS) Springer, August 2017, Jeju Island, South Korea
(Acceptance rate (47.1%): 25 out of 53 submissions)
- **[USENIX ASE].** William Johnson, **Irfan Ahmed**, Vassil Roussev, Cynthia B. Lee, "Peer Instruction for Digital Forensics", USENIX Advances in Security Education Workshop (ASE'17), co-located with 26^{th} USENIX Security Symposium, August 2017, Vancouver, BC, Canada
(Acceptance rate (46.1%): 12 out of 26 submissions)
- **[DFRWS].** Saranyan Senthivel, **Irfan Ahmed**, Vassil Roussev, "SCADA Network Forensics of the PCCC Protocol", In the 17^{th} Annual Digital Forensics Research Conference (DFRWS'17), August 2017, Austin, USA.
(Acceptance rate (32%): 13 out of 41 submissions)
- **[Taylor & Francis JCST].** Justin Russell, Carl Weems, **Irfan Ahmed**, Golden G. Richard III, "Self-reported secure and insecure cyber behaviour: factor structure and associations with personality factors", Journal of Cyber Security Technology, Taylor & Francis, July 2017.
- **[ACSAC ICSS]. Irfan Ahmed**, Vassil Roussev, William Johnson, Saranyan Senthivel, Sneha Sudhakaran, "A SCADA System Testbed for Cybersecurity and Forensic Research and Pedagogy", In the 2^{nd} Annual Industrial Control System Security Workshop (ICSS'16), In conjunction with 32^{nd} Annual Computer Security Applications Conference (ACSAC'16), December 2016, Los Angeles, CA.
- **[Elsevier DI].** Vassil Roussev, **Irfan Ahmed**, Andres Barreto, Shane McCulley, Vivek Shanmughan, "Cloud Forensics-Tool Development Studies & Future Outlook", Digital Investigation, Elsevier, Vol. 18, No. 3, September 2016.

(Impact Factor: 1.77 in 2017)

- **[USENIX ASE].** William Johnson, Allison Luzader, **Irfan Ahmed**, Vassil Roussev, Golden G. Richard III, Cynthia B. Lee, "Development of Peer Instruction Questions for Cybersecurity Education", USENIX Advances in Security Education Workshop (ASE'16), co-located with 25^{th} USENIX Security Symposium, August 2016, Austin, TX
(Acceptance rate (57.1%): 12 out of 21 submissions)
- **[WiSec].** Aisha Ali-Gombe, Golden G. Richard III, **Irfan Ahmed**, Vassil Roussev, "Don't Touch that Column: Portable, Fine-Grained Access Control for Android's Native Content Providers", In the 9^{th} ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec'16), July 2016, Darmstadt, Germany.
(Acceptance rate (26%): 13 out of 51 submissions)
- **[IFIP DF].** Vassil Roussev, Andres Barreto, **Irfan Ahmed**, "Forensic Acquisition of Cloud Drives", In the 12^{th} IFIP WG 11.9 International Conference on Digital Forensics, Jan 2016, New Delhi, India
- **[ACSAC PPREW].** Aisha Ali-Gombe, **Irfan Ahmed**, Golden G. Richard III, Vassil Roussev, "OpSeq: Android Malware Fingerprinting", In the 5^{th} Program Protection and Reverse Engineering Workshop (PPREW'15), In conjunction with 31^{st} Annual Computer Security Applications Conference (ACSAC'15), December 2015, Los Angeles, CA, USA.
- **[CODASPY]. Irfan Ahmed**, Vassil Roussev, Aisha Ali Gombe, "Robust Fingerprinting for Relocatable Code", In the 5^{th} ACM Conference on Data and Application Security and Privacy (CODASPY'15), March 2015, San Antonio, TX, USA.
(Acceptance rate (21%): 19 out of 91 submissions)
- **[DFRWS].** Vassil Roussev, **Irfan Ahmed**, Thomas Sires, "Image-Based Kernel Fingerprinting", In the 14^{th} Annual Digital Forensics Research Conference (DFRWS'14), August 2014, Denver CO, USA.
(Acceptance rate (29%): 15 out of 52 submissions)
- **[ISC]. Irfan Ahmed**, Golden G. Richard III, Aleksandar Zoranic, Vassil Roussev, "Integrity Checking of Function Pointers in Kernel Pools via Virtual Machine Introspection", In the 16^{th} Information Security Conference (ISC'13), November 2013, Dallas, Texas, USA.
(Acceptance rate (23%): 16 out of 70 submissions)
(Best Paper Award)
- **[IFIP DF]. Irfan Ahmed**, Aleksandar Zoranic, Salman Javaid, Golden G. Richard III, Vassil Roussev "Rule-based Integrity Checking of Interrupt Descriptor Table in Cloud Environments", In the 9^{th} IFIP WG 11.9 International Conference on Digital Forensics, January 2013, Orlando, Florida.
- **[ACSAC LAW].** Salman Javaid, Aleksandar Zoranic, **Irfan Ahmed**, Golden G. Richard III, "Atomizer: Fast, Scalable and Lightweight Heap Analyzer for Virtual Machines in a Cloud Environment", In the 6^{th} Layered Assurance Workshop (LAW'12), In conjunction with 28^{th} Annual Computer Security Applications Conference (ACSAC'12), December 2012, Orlando, Florida, USA.
- **[IEEE Computer]. Irfan Ahmed**, Sebastian Obermeier, Martin Naedele, Golden G. Richard III, "SCADA Systems: Challenges for Forensic Investigators", In IEEE Computer, Vol. 45, No. 12, December 2012.
(Impact Factor: 1.75 in 2017)
- **[ICPP CloudSec]. Irfan Ahmed**, Aleksandar Zoranic, Salman Javaid, Golden G. Richard III, "ModChecker: Kernel Module Integrity Checking in the Cloud Environment", In the 4^{th} International Workshop on Security in Cloud Computing (CloudSec'12), In conjunction with 41^{st} International Conference on Parallel Processing (ICPP'12), Sept 2012, Pittsburgh, Pennsylvania.
- **[Springer IJIS]. Irfan Ahmed**, Martin Naedele, Bradley Schatz, Ryoichi Sasaki, Andrew West, "SCADA System Security", In International Journal of Information Security, Springer, Vol. 11, No. 4, August 2012. *(Editorial)*
(Impact Factor: 1.91 in 2016)

- **[Springer JCV]. Irfan Ahmed**, Kyung-suk Lhee, "Classification of Packet Contents for Malware Detection", In Journal of Computer Virology and Hacking Techniques, Springer, Vol. 7, No. 4, pp. 279-295, October 2011.
- **[NSS].** Eesa Al Soalmi, Colin Boyd, Andrew Clark and **Irfan Ahmed**, "User-Representative Feature Selection for Keystroke Dynamics" In the 5^{th} IEEE International Conference on Network and System Security (NSS' 11), pp. 229-233, September 2011, Milan, Italy.
(Acceptance rate (44%): 56 out of 127 submissions)
- **[ICRC].** Nishchal Kush, Ernest Foo, Ejaz Ahmed, **Irfan Ahmed**, Andrew Clark, "Gap Analysis of Intrusion Detection in Smart Grids", In International Cyber Resilience Conference, pp. 38-46, August 2011, Perth, Australia.
(Best Paper Award)
- **[IFIP DF]. Irfan Ahmed**, Kyung-suk Lhee, Hyunjung Shin, and ManPyo Hong, "Fast Content-based File-type Identification", In the 7^{th} IFIP WG 11.9 International Conference on Digital Forensics, pp. 65-75, February 2011, Orlando, Florida, USA.
- **[IETE TR]. Irfan Ahmed**, Kyung-suk Lhee, Hyunjung Shin, and ManPyo Hong, "Content-based File-type Identification using Cosine Similarity and a Divide-and-Conquer approach", In IETE Technical Review, Vol. 27, No. 6, pp. 465-477, Nov 2010.
(Impact Factor: 1.33 in 2017)
- **[SAC]. Irfan Ahmed**, Kyung-suk Lhee, Hyunjung Shin, and ManPyo Hong, "Fast File-type Identification", In the 25^{th} Annual ACM Symposium on Applied Computing, (SAC'10), ACM Special Interest Group on Applied Computing (SIGAPP), March 2010, Sierre, Switzerland.
- **[ACISP]. Irfan Ahmed**, Kyung-suk Lhee, Hyunjung Shin, and ManPyo Hong, "On Improving the Accuracy and Performance of Content-based File-type Identification", In the 14^{th} Australasian conference on information security and privacy (ACISP'09), Lecture notes in computer science (LNCS), pp. 44-59, July 2009, Brisbane, Australia.
(Acceptance rate (28%): 30 out of 106 submissions)
- **[ARES]. Irfan Ahmed**, Kyung-suk Lhee, "Detection of Malcodes by Packet Classification", In the International Workshop on Privacy and Security by means of Artificial Intelligence (PSAI'08), In conjunction with the 3^{rd} IEEE International Conference on Availability Reliability and Security (ARES'08), March 2008, Barcelona, Spain.
- **[IAS]. Irfan Ahmed**, Usman Tariq, Shoaib Mukhtar, Kyung-suk Lhee, Seung-Wha Yoo, Piao Yanji and Manpyo Hong, "Binding Update Authentication Scheme for Mobile IPv6", In the 3^{rd} IEEE International Symposium on Information Assurance and Security (IAS'07), pp. 109-114, August 2007, Manchester, United Kingdom.
(Acceptance rate (42.5%): 60 out of 141 submissions)

INVITED TALKS, PRESENTATIONS, DEMOS, AND POSTERS

- **[ACSAC ICSS]. Irfan Ahmed**, "How are PLCs Insecure by Design? A Story of Experiments and Experiences on Real-world PLCs", In the 8^{th} Industrial Control System Security (ICSS) Workshop, with Annual Computer Security Applications Conference (ACSAC), Austin TX, December 2022.
- **[HoTSoS].** Adeen Ayub, Hyunguk Yoo, **Irfan Ahmed**, "Empirical Study of PLC Authentication Protocols in Industrial Control Systems", In the 9^{th} Annual Hot Topics in the Science of Security (HoTSoS) Symposium, April 2022. *(Held Virtually)*
- **[CODASPY].** Ramyapandian Vijayakanthan, **Irfan Ahmed**, Aisha Ali-Gombe, "Transforming Memory Image to Sound Wave Signals for an Effective IoT Fingerprinting", In 12^{th} ACM Conference on Data and Application Security and Privacy (CODASPY'22), Baltimore-Washington DC Area, April 2022. *(Poster)*

- **[WiCyS].** Adeen Ayub, Hyunguk Yoo, **Irfan Ahmed**, "ROP on PLCs", In the 9^{th} Annual Women in Cybersecurity (WiCyS) Conference, Cleveland, OH, March 2022.
- **[WiCyS].** Ramyapandian Vijayakanthan, **Irfan Ahmed**, Aisha Ali-Gombe, "Comparative Analysis on IoT Memory Images Generated using Hardware and Software Acquisition", In the 9^{th} Annual Women in Cybersecurity (WiCyS) Conference, Cleveland, OH, March 2022.
- **[AAFS].** Syed Ali Qasim, **Irfan Ahmed**, "A Case Study of Virtual Programmable Logic Controllers (PLC) Forensic Framework on Investigating Control Logic Attacks in a Belt Conveyor System", In the 74^{th} Annual Meeting of the American Academy of Forensic Sciences, February 2022, Seattle, Washington. *(Extended Abstract)*
- **[AAFS].** Muhammad Haris Rais, **Irfan Ahmed**, "A Forensic Readiness Model for the Fused Filament Fabrication (FFF)-Based Additive Manufacturing (AM) Process", In the 74^{th} Annual Meeting of the American Academy of Forensic Sciences, February 2022, Seattle, Washington. *(Extended Abstract)*
- **[AAFS].** Muhammad Haris Rais, **Irfan Ahmed**, "Memory Forensic Analysis for Programmable Logic Controllers (PLCs)", In the 74^{th} Annual Meeting of the American Academy of Forensic Sciences, Seattle, Washington, February 2022. *(Poster)*
- **[ICOSST].** "Digital Forensics of Industrial Control Systems", In 15^{th} IEEE International Conference on Open Source Systems And Technologies (ICOSST 2021), December 2021
- **[WiCyS].** Adeen Ayub, **Irfan Ahmed**, Hyunguk Yoo, "Empirical Analysis of PLC Authentication Protocols in Industrial Control Systems", In the 8^{th} Annual Women in Cybersecurity (WiCyS) Conference, Denver, CO, September 2021.
(Best Poster Award)
- **[WiCyS].** Nixy Camacho, Adeen Ayub, **Irfan Ahmed**, Hyunguk Yoo, "Automating Binary Analysis of PLCs", In the 8^{th} Annual Women in Cybersecurity (WiCyS) Conference, Denver, CO, September 2021. *(Poster)*
- **[ACNS CIMSS].** Syed Ali Qasim, **Irfan Ahmed**, "Virtual PLC-assisted Forensic Analysis of Control Logic Injection Attacks", In the 1^{st} International Workshop on Critical Infrastructure and Manufacturing System Security (CIMSS) in conjunction with the 19^{th} International Conference on Applied Cryptography and Network Security, Kamakura, Japan, June 2021. *(Demo)*
- **[ACNS CIMSS].** Muhammad Haris Rais, Ye Li, **Irfan Ahmed**, "On Detecting Sabotage Attacks on 3D Printing Process", In the 1^{st} International Workshop on Critical Infrastructure and Manufacturing System Security (CIMSS) in conjunction with the 19^{th} International Conference on Applied Cryptography and Network Security, Kamakura, Japan, June 2021. *(Demo)*
- **[DHS ICSJWG]. Irfan Ahmed**, "Control-logic Forensics of Denial of Engineering Operations (DEO) Attacks", In Industrial Control Systems Joint Working Group (ICSJWG) meeting organized by DHS Cybersecurity and Infrastructure Security Agency (CISA), April 2021. *(Presentation)*
- **[ARPCON].** "Using RAM as a Playground to Explore OS Kernel-level Attacks", In ARPCON, October 2020
- **[RAEE & CS].** "A Tale of a New PLC in Town: Exploitation and Mitigation of Modicon M221 Programmable Logic Controller, In International Symposium on Recent Advances in Electrical Engineering and Computer Sciences, Islamabad, Pakistan October 2020
- **[DHS ICSJWG]. Irfan Ahmed**, "Control Logic Attacks and Mitigation: A Case Study of Modicon M221 Programmable Logic Controller", In Industrial Control Systems Joint Working Group (ICSJWG) meeting organized by DHS Cybersecurity and Infrastructure Security Agency (CISA), Sept 2020. *(Presentation)*
- **[UET Lahore].** "Research Topics in Cybersecurity", University of Engineering and Technology, Lahore, `https://uet.edu.pk/`, Jan 2020, Lahore, Pakistan. *(Duration: 90 minutes)*

- **[PIEAS].** "Research Topics in Cybersecurity", Pakistan Institute of Engineering and Applied Sciences (PIEAS), `http://www.pieas.edu.pk/`, Jan 2020, Islamabad, Pakistan. *(Duration: 90 minutes)*
- **[ACSAC ICSS].** "Control Logic Injection Attacks and Defenses", In 5^{th} Annual Industrial Control System Security Workshop (ICSS'19), In conjunction with 35^{th} Annual Computer Security Applications Conference (ACSAC'19), December 2019, San Juan, Puerto Rico.
- **[NEDUET].** "Research Topics in Cybersecurity", NED University of Engineering and Technology, `https://www.neduet.edu.pk/`, Dec 2019, Karachi, Pakistan. *(Duration: 90 minutes)*
- **[DFRWS].** Muhammad Haris Rais, Ye Li, **Irfan Ahmed**, "Forensic Readiness Framework for 3D printing process: A case study of Ultimaker 3", In the 20^{th} Annual Digital Forensics Research Conference (DFRWS'20), July 2020, Memphis, TN. *(Presentation)*
- **[ICPS].** Carl Weems, Golden Richard III, **Irfan Ahmed**, Justin Russell, Erin Neill, Marsee Monica, "Susceptibility and Resilience to Cyber Threat: Findings from a Scenario Decision Program to Measure Secure and Insecure Computing Behavior", In International Convention of Psychological Science (ICPS), March 2019, Paris, France. *(Poster)*
- **[AAFS]. Irfan Ahmed**, "A Ladder Logic Decompiler for Supervisory Control and Data Acquisition (SCADA) Network Forensics", In the 71^{st} Annual Meeting of the American Academy of Forensic Sciences, February 2019, Baltimore, MD, USA. *(Extended Abstract)*
- **[ACSAC ICSS].** "Programmable Logic Controller Forensics", In 3^{rd} Annual Industrial Control System Security Workshop (ICSS'17), In conjunction with 33^{rd} Annual Computer Security Applications Conference (ACSAC'17), December 2017, Orlando, FL USA.
- **[Sacred Heart University].** "Modern Critical Infrastructure at the Risk of Cyberattacks", Sacred Heart University, `http://www.sacredheart.edu`, Oct 2017, Fairfield, CT, USA. *(Duration: 90 minutes)*
- **[NOLASec].** "An Industrial Control System Testbed for Cybersecurity and Forensic Research and Pedagogy", NOLASec computer security group, `https://sites.google.com/site/nolasecurity`, Aug 2017, New Orleans, LA, USA. *(Duration: 60 minutes)*
- **[NSRI].** "Digital Forensics of Industrial Control System: An Academia Viewpoint", National Security Research Institute (NSRI), `http://www.nst.re.kr/nst_en/member/03_12.jsp`, August 2017, Yuseong-gu, Daejeon, South Korea. *(Duration: 2 hours)*
- **[Soonchunhyang University].** "Digital Forensics of Industrial Control System: An Academia Viewpoint", Soonchunhyang University, `http://sgee.sch.ac.kr/`, August 2017, Chungcheongnam-do, South Korea. *(Duration: 60 minutes)*
- **[Ajou University].** "Digital Forensics of Industrial Control System: An Academia Viewpoint", Ajou University, `https://www.ajou.ac.kr/en/`, August 2017, Suwon, Gyeonggi-do, South Korea. *(Duration: 60 minutes)*
- **[AAFS]. Irfan Ahmed**, "Supervisory Control and Data Acquisition (SCADA) Forensics: Network Traffic Analysis for Extracting a Programmable Logic Controller (PLC) System and Programming Logic Files", In the 69^{th} Annual Meeting of the American Academy of Forensic Sciences, February 2017, New Orleans, USA. *(Extended Abstract)*
- **[CODASPY].** Aisha Ibrahim Ali-Gombe, **Irfan Ahmed**, Golden G. Richard III, Vassil Roussev, "AspectDroid: Android App Analysis System", In 6^{th} ACM Conference on Data and Application Security and Privacy (CODASPY'16), March 2016, New Orleans, LA, USA. *(Poster)* ***(Outstanding Poster Award)***
- **[CODASPY].** Anjila Tamrakar, Justin D. Russell, **Irfan Ahmed**, Golden G. Richard III, Carl F. Weems, "SPICE: A Software Tool for Bridging the Gap Between End-user's Insecure Cyber Behavior and Personality Traits", In 6^{th} ACM Conference on Data and Application Security and Privacy (CODASPY'16), March 2016, New Orleans, LA, USA. *(Poster)*

- **[AAFS]. Irfan Ahmed**, Vassil Roussev, Aisha Ali Gombe, "Memory Forensics: Reliable In-Memory Code Identification Using Relocatable Pointers", In the 67^{th} Annual Meeting of the American Academy of Forensic Sciences, February 2015, Orlando, FL, USA. *(Extended Abstract)*
- **[ACSAC MMF].** "Reliable In-Memory Code Identification Using Relocatable Pointers", In Malware Memory Forensics Workshop (MMF), In conjunction with 30th Annual Computer Security Applications Conference (ACSAC'14), December 2014, New Orleans, LA, USA.
- **[AAFS]. Irfan Ahmed**, Golden G. Richard III, "Kernel Pool Monitoring to Support Malware Forensics in a Cloud Computing Environment", In the 66^{th} Annual Meeting of the American Academy of Forensic Sciences, February 2014, Washington, USA. *(Extended Abstract)*
- **[AAFS].** Golden G. Richard III, **Irfan Ahmed**, "Compressed RAM and Live Forensics", In the 66^{th} Annual Meeting of the American Academy of Forensic Sciences, February 2014, Washington, USA. *(Extended Abstract)*
- **[ACSAC]. Irfan Ahmed**, Aleksandar Zoranic, "HookLocator: Function Pointer Integrity Checking in Kernel Pools via Virtual Machine Introspection", In 29^{th} Annual Computer Security Applications Conference (ACSAC'13), December 2013, New Orleans, LA, USA. *(Poster)*
- **[ACSAC].** Aisha Ali-Gombe, **Irfan Ahmed**, Golden G. Richard III, "DROIDHOOK: Android MalApp Detection Through Context", In 29^{th} Annual Computer Security Applications Conference (ACSAC'13), December 2013, New Orleans, LA, USA. - *(Presentation)*
- **[AAFS]. Irfan Ahmed**, Golden G. Richard III, "Live Forensic Analysis of Kernel Code for Malware Detection in Cloud Computing Environments", In the 65^{th} Annual Meeting of the American Academy of Forensic Sciences, February 2013, Washington, USA. *(Extended Abstract)* ***(Outstanding Research Award)***
- **[ACSAC NGMAD].** "Integrity Checking of Function Pointers in Kernel Pools – A Virtual Machine Introspection based Approach", In the Next Generation Malware Attacks and Defense Workshop (NGMAD), In conjunction with 29th Annual Computer Security Applications Conference (ACSAC'13), December 2013, New Orleans, LA, USA.
- **[BIDM].** "Computer Forensics with Data Mining: File-Type Identification", In the Business Intelligence and Data Mining Conference (BIDM 2010), pp. 110-123, April, 2010, Seoul, South Korea.

TECHNICAL WORKSHOPS

- **[DFRWS EU].** "Network Forensics of Industrial Control Systems", In the 9^{th} Annual Digital Forensics Research Conference Europe (DFRWS EU'22), March 2022, Oxford, United Kingdom. *(Duration: 2 hours)*
- **[Fordham University]** "Supervisory Control and Data Acquisition (SCADA) System Security", Fordham University, New York, USA, Jun 2016. *(Duration: 4 hours)*
- **[QUT]** "Network Forensics", Queensland University of Technology (QUT), Brisbane, Australia, Jun 2011. *(Duration: 1 hours)*

EXPERIENTIAL AND OUTSIDE CLASS LEARNING

- *Faculty Advisor*, VCU Cybersecurity Club, 2022 - to-date
- *Program Director*, Cyber4n6 Program with Virginia State Police, 2023
  Funded by Virginia Commonwealth Cyber Initiative (CCI)
  `https://www.people.vcu.edu/~iahmed3/cyber4n6.html`
- *Program Director*, GenCyber Cybersecurity Summer Bootcamp at VCU, 2021-2023
  Funded by the NSA/NSF, `https://gencyber.vcu.edu/`

- *Mentor*, CyberForce Competition (to defend/attack cyber-physical scenario), 2022
  Organized by the Department of Energy (DOE), `https://cyberforce.energy.gov/`

THESIS/RESEARCH ADVISOR

Postdocs:

- Wooyeon Jo — Aug 2022 - Present
  PhD from Ajou University, South Korea
- Hyunguk Yoo — Aug 2017 - July 2018
  PhD from Ajou University, South Korea
  First employment: Assistant Professor at University of New Orleans

PhD Students:

- Ashwini Vasudev — Aug 2022 - to-date
- Nehal Ameen — Aug 2022 - to-date
- Muhammad Ahsan — Aug 2021 - to-date
- Adeen Ayub — Jan 2020 - to-date
  Awards: 1) Best Paper Award at DFRWS'22,
  2) Best Poster Award at WiCyS'21, and
  3) Outstanding Early Career Student Researcher Award from VCU Computer Science
- Muhammad Haris Rais — Jan 2019 - May 2023 (expected)
  Awards: 1) Best Student Paper Award at DFRWS'22, and
  2) Winner of 3MT competition at VCU College of Engineering
- Syed Ali Qasim — Aug 2017 - May 2023 (expected)
  Awards: 1) Best Student Paper Award at DFRWS'20
- Aisha Ibrahim Ali-Gombe — August 2013 - May 2017
  Thesis Title: Malware Analysis and Privacy Policy Enforcement Techniques for Android Applications
  Co-supervised by: Dr. Golden G. Richard III
  Awards: 1) Outstanding Poster Award at CODASPY'16
  Employment: Associate Professor at Louisiana State University, LA
- Eesa Alsolami — Mar 2011-Aug 2012
  Thesis Title: Continuous Biometric Authentication: Keystroke Dynamics
  Co-supervised by: Dr. Colin Boyd
  First employment: Assistant Professor at University of Jeddah, Saudi Arabia

Master Students:

- Pranita Deshpande — May 2017 - Aug 2018
  Thesis Title: Assessment of Two Pedagogical Tools for Cybersecurity Education
  Publications: ACM SIGCSE'19 (a), and ACM SIGCSE'19 (b)
- Sharon Elizabeth Blake — Aug 2016 - July 2018
  Thesis Title: MAnanA: A Heuristic Scoring Framework for Concept Map Analysis in Cybersecurity Education
- Sushma Kalle — Aug 2017 - July 2018
  Thesis Title: Semantic-aware Stealthy Control Logic Infection Attack
  Publications: NDSS BAR'19, and DIMVA'19
- Jonathan Grimm — Sept 2015 - Aug 2017
  Thesis Title: Automatic Mitigation of Kernel Rootkits in Cloud Environments
  Publications: WISA'18

- Saranyan Senthivel June 2016 - July 2017
  Thesis Title: Automatic Forensic Analysis of PCCC Network Traffic Log
  Publications: ACSAC ICSS'16, DFRWS'17, and CODASPY'18
- William Eldon Johnson July 2015 - May 2017
  Thesis Title: Development of Peer Instruction Material for a Cybersecurity Curriculum
  Publications: ACSAC ICSS'16, USENIX ASE'16, and USENIX ASE'17
- Anjila Tamrakar June 2014 - April 2016
  Thesis Title: SPICE: A Software Tool for Studying End-user's Insecure Cyber Behavior and Personality-traits
  Publications: CODASPY'18
- Dalbir Kaur Chhabra Jan 2014 - Aug 2014
  Thesis Title: Feature Selection and Clustering for Malicious and Benign Software Characterization

Undergraduate Students:

- Vishaal Mehta March 2022 - To-Date
- Joseph Dinsmoor June 2021 - To-Date
- Nixy Camacho Oct 2020 - Aug 2021
- Max Safo Feb 2021 - Aug 2021
- Masrik Dahir June 2020 - May 2021
  Publications: IEEE Access Journal 2021
- Francisco Perez Feb 2021 - May 2021
- Amrita Harshini Kondeti June 2020 - Aug 2020
- Byron Stearns Feb 2020 - Aug 2020
- Jose Rene Berlioz Rivera Aug 2017 - May 2018
- Shrey Dhungana May 2017 - May 2018
  Publications: ACM CODASPY'18
- Nabeel Gulzar Rana Aug 2017 - July 2018
- Manish Bhatt Dec 2016 - May 2017
  Publications: WISA'17
- Banan Ibrahim Oct 2016 - Jun 2017
- Phillip Bradley Reason Feb 2016 - Jul 2016
- Philip Schwartz May 2014 - Aug 2014

High School Students:

- Bradley King July 2020 - June 2021

Other Graduate Research Assistants:

- Manish Bhatt May 2017 - Jul 2018
  Publications: SIGCSE'18, and DFRWS'18
- Nehal Ameen January 2018 - Aug 2018
  Publications: NDSS BAR'19
- Sneha Sudhakaran June 2016 - Aug 2017
  Publications: ACSAC ICSS'16, and IEEE S&P'17
- Allison Luzader June 2015 - Dec 2015
  Publications: USENIX ASE'16
- Nishchal Kush Mar 2011-Sept 2011
  Publications: ICRC'11

THESIS COMMITTEE MEMBER

PhD Students:

- Ramyapandian Vijayakanthan — Current
  Towson University, MD
- Douglas Krug — Current
  Code Beats - Teaching Computer Programming Coding via Hip Hop Beats
  Virginia Commonwealth University, VA
- Santosh Kumar Nukavarapu — May 2022
  AI-assisted Tools for the Security and Privacy of Edge Devices
  Virginia Commonwealth University, VA
- Joseph T. Sylve — May 2017
  Towards Real-Time Volatile Memory Forensics: Frameworks, Methods, and Analysis
  University of New Orleans, LA

Master Students:

- Shane McCulley — May 2017
  Forensic Analysis of G-Suite Collaborative Services
  University of New Orleans, LA
- Vivek Oliparambil Shanmughan — May 2017
  Lightweight Environment for Cyber Security Education
  University of New Orleans, LA
- Andrew Case — June 2016
  Detecting Objective-C Malware through Memory Forensics
  University of New Orleans, LA
- Elyse Bond — June 2015
  Creating Volatility Support for FreeBSD
  University of New Orleans, LA
- Andres E. Barreto — June 2015
  API-Based Acquisition of Evidence from Cloud Storage Providers
  University of New Orleans, LA
- Robert Strickland — June 2015
  GPU Keystroke Logging and Detection on Microsoft Windows with Kernel Mode Drivers
  University of New Orleans, LA
- Salman Javaid — Aug 2014
  Analysis and Detection of Heap-base Malware Using Introspection in a Virtualized Environment
  University of New Orleans, LA
- Christopher Stelly — Nov 2013
  Dynamic User Defined Permissions for Android Devices
  University of New Orleans, LA
- Deekshit Kura — Nov 2013
  Categorization of Large Corpora of Malicious Software
  University of New Orleans, LA

ACADEMIC SERVICES

Funding Proposal Peer-reviewer

- The US Department of Defense (DoD) SMART (Science, Mathematics, and Research for Transformation) Scholarship for Service Program - 2022
- UTSA Limited Submission for NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) - 2021
- National Science Foundation (NSF) CyberTraining – 2021 (small), 2022 (medium)
- National Nuclear Security Administration (NNSA) - Minority Serving Institution Partnership Program (MSIPP), 2020, 2021, 2022
- ORAU Ralph E. Powe Junior Faculty Award, 2020
- Department of Homeland Security (DHS) - Office of University Programs for Criminal Investigations and Network Analysis (CINA) - Biennial Review, 2019
- DHS Office of University Programs for Terrorism Prevention and Counterterrorism Research (TPCR) Center of Excellence (COE), 2019
- University of Texas at San Antonio (UTSA) Limited Submission for Department of Defense's Historically Black Colleges and Universities/Minority Institutions (HBCU/MI) Science Program for basic research, 2019
- Florida Center for Cybersecurity - Collaborative Seed Awards and Capacity Building Awards, 2018, 2019, 2020
- UTSA Limited Submission for the NSF Major Research Instrumentation (MRI), 2018
- UTSA Limited Submission for Johnson & Johnson Scholars Program, 2018
- DHS Scientific Leadership Awards at Minority Serving Institutions, 2016
- VCU Breakthroughs Funding Program, 2022

Keynote Speaker, Panel Moderator and Panelist

- **Keynote Speaker**, "Searching for digital evidence in SCADA systems", In the 18^{th} Annual IFIP WG 11.9 International Conference on Digital Forensics, January 2022 *(virtual)*
- **Moderator**, a panel on "Industrial Cybersecurity Education", In the 7^{th} Industrial Control System Security (ICSS) Workshop, In conjunction with Annual Computer Security Applications Conference (ACSAC), Dec 2021
- **Panelist**, "Infrastructure Cybersecurity: Industry, Government, and Academia Viewpoints", University of New Orleans Engineering Forum, and Southeast Symposium on Contemporary Engineering Topics (SSCET), New Orleans LA, Sept 2017.
- **Moderator**, a panel on "SCADA System Security: Challenges and Future Directions", Annual Computer Security Applications Conference (ACSAC), New Orleans LA, Dec 2014

General Chair/Program Chair/Track Chair of Conference/Workshop

- **Program Co-Chair**, *Digital Forensics Research Conference USA (DFRWS USA)*
  - 23^{rd} annual conference on July, 2023
    `https://dfrws.org/conferences/dfrws-usa-2023`
- **Program Chair**, *Industrial Control System Security (ICSS) Workshop*, In conjunction with Annual Computer Security Applications Conference (ACSAC)
  - 8^{th} workshop on December, 2022 at Austin, TX
    `https://www.acsac.org/2022/workshops/icss/`
  - 7^{th} workshop on December, 2021 (virtual)
    `https://www.acsac.org/2021/workshops/icss/`
  - 6^{th} workshop on December, 2020 at Austin, TX
    `https://www.acsac.org/2020/workshops/icss/`
  - 5^{th} workshop on December, 2019 at San Juan, Puerto Rico, USA
    `https://www.acsac.org/2019/workshops/icss/`

  - 4^{st} workshop on December, 2018 at San Juan, Puerto Rico, USA
    `https://www.acsac.org/2018/workshops/icss/`
  - 3^{rd} workshop on December, 2017 at Orlando, FL
    `https://www.acsac.org/2017/workshops/icss/`
  - 2^{nd} workshop on December, 2016 at Los Angeles, California
    `http://acsac.org/2016/workshops/icss/`
  - 1^{st} workshop on December, 2015 at Los Angeles, California
    `http://acsac.org/2015/workshops/icss/`
- **General Co-chair**, 10^{th} *EAI International Conference on Digital Forensics & Cyber Crime (ICDF2C)*, September 2018, New Orleans, USA
  `http://d-forensics.org/`
- **Program Chair**, *Malware Memory Forensics Workshop (MMF)*, In conjunction with 30^{th} Annual Computer Security Applications Conference (ACSAC'14), December 2014, New Orleans, LA, USA.
  `https://www.acsac.org/2014/workshops/mmf/`
- **Track Chair**, *Intrusion Detection and Forensics Track*
  IEEE World Congress on Information and Communication Technologies (WICT 2011), 11-14 December 2011, Mumbai, India
  `http://www.mirlabs.net/wict11/`

Technical Program Committee Member

- American Academy of Forensic Sciences (AAFS) - 2023
- International Workshop on Additive Manufacturing Security (AMSec), in conjunction with ACM CCS - 2022
- IEEE International Conference on Machine Learning and Applications (ICMLA), 2021, 2022
- ACM Conference on Data and Application Security and Privacy (CODASPY) – 2019, 2020, 2021, 2022
- IFIP Working Group 11.10 International Conference on Critical Infrastructure Protection (ICCIP) - 2021, 2022
- Digital Forensics Research Conference (DFRWS USA) – 2015, 2016, 2020, 2021, 2022, 2023
- Digital Forensics Research Conference (DFRWS Europe) – 2021, 2022, 2023
- International Workshop on Critical Infrastructure and Manufacturing System Security (CIMSS), in conjunction with ACNS – 2021, 2022
- IEEE International Conference on Big Data (IEEE BigData) – 2019, 2020, 2021, 2022
- ACM Technical Symposium on Computer Science Education (SIGCSE) – 2017, 2018, 2019, 2020, 2021, 2022
- Annual Conference on Innovation and Technology in Computer Science Education (ITiCSE) – 2020, 2021, 2022
- International Conference on Smart City and Informatization (iSCI) – 2019, 2020
- International Conference on Internet Monitoring and Protection (ICIMP) – 2018, 2019
- International Conference on Digital Forensics & Cyber Crime (ICDF2C) – 2013, 2014, 2015, 2016, 2017, 2018
- International Conference on High Performance Computing and Communications (HPCC) – 2014
- International Conference on Emerging Technologies (ICET) – 2012, 2013, 2017
- Annual Cyber and Information Security Research Conference (CISRC), held at Oak Ridge National Laboratory – 2018
- International Workshop on Cyber-Physical Systems (IWCPS), held with IEEE TrustCom – 2018
- International Conference on Cyber-Technologies and Cyber-Systems (CYBER) – 2018
- The Northwest Cybersecurity Symposium at Pacific Northwest National Laboratory (Cybersec) – 2020
- IEEE Top Picks Workshop in Hardware and Embedded Security, Co-located with the International Conference On Computer Aided Design (ICCAD) – 2021
- Cloud S&P in conjunction with ACNS – 2022

- IARIA International Conference on Data Analytics – 2022

External Cybersecurity Curriculum Reviewer

- Consultant on developing a process for reviewing the relevancy of the curriculum materials in the CLARK library, `https://clark.center`, 2021
- Chair, External Curriculum Reviewer Team, Master of Science (MS) in Cybersecurity Engineering, University of New Hampshire, 2019
- External Reviewer, NSA National Cybersecurity Curriculum (NCCP) Program - Two courses on the Cybersecurity of Industrial Control Systems, 2018

Tenure and Promotion (T&P) Case Evaluator

- School of Computer Science & Engineering at Sacred Heart University, Fairfield, CT, 2022
- Computer Science Department at Rowan University, Glassboro, NJ, 2022
- Department of Computer & Electrical Engineering and Computer Science at the Florida Atlantic University, Boca Raton, FL, 2021

PhD/Master Thesis - External Examiner/Reviewer

- [**PhD Thesis**] *Shahab Tahzeeb*, "Machine Learning Techniques for Analysis of Protein Sequences", NED University of Engineering & Technology, Pakistan, 2022
- [**PhD Thesis**] *Sana Shokat*, "An Analysis Of Braille On Accessible Touch Screen Using Deep Learning Methods", Department of CS & IT, University of Azad Jammu and Kashmir, Pakistan, 2021
- [**PhD Thesis**] *Zareen Abbas*, "Incorporating Memristors for Efficient Processor Design", NED University of Engineering & Technology, Pakistan, 2021
- [**PhD Thesis**] *Nazim Uddin Sheikh*, "Quantifying Privacy Threats in Aggregated Energy Data Analytics", Macquarie University, Australia, 2021
- [**PhD Thesis**] *Beenish Ayesha Akram*, "Context Aware Services Portal for the Global Access of Sensing-Based Applications in Cellular Networks and Internet", Department of Computer Science and Engineering, University of Engineering and Technology, Lahore Pakistan, 2019
- [**PhD Thesis**] *Nicholas R. Rodofile*, "Generating Attacks and Labelling Attack Datasets for Industrial Control Intrusion Detection Systems", Queensland University of Technology, Brisbane, Australia, 2018
- [**PhD Thesis**] *Abdur Rehman*, "Development of Feature Extraction Algorithms for Classification of Text Documents", Department of Computer Science and Engineering, University of Engineering and Technology, Lahore Pakistan, 2016

Editorial Work

- **Distinguished Editorial Board Member**, In International Journal of Cyber Forensics and Advanced Threat Investigations (CFATI) (2021 - To-date)
  `https://conceptechint.net/index.php/CFATI/index`
- **Review Editor**, *Cybersecurity and Privacy Section*, In Frontiers in Big Data (2018 - To-date)
  `https://www.frontiersin.org/journals/big-data#`
- **Guest Editor**, *Special Issue on Advances in Pervasive Computing and Communication Technologies*, In Computers, Materials & Continua (CMC), Tech Science Press, 2022
- **Guest Editor**, *Special Issue on Pervasive Computing and Communication: Challenges, Technologies & Opportunities*, In Computers, Materials & Continua (CMC), Tech Science Press, 2021
- **Guest Editor**, *Special Issue on SCADA and Control System Security*, In International Journal of Information Security (IJIS), Springer, Vol. 11, No. 4, August 2012
- **Guest Editor**, *Special Issue on Applications of Machine Learning Techniques on Intrusion Detection and Digital Forensics*, In Security and Communication Networks Journal, Wiley, May 2011
  `http://onlinelibrary.wiley.com/doi/10.1002/sec.344/full`

Journal Reviewer

- IEEE Transactions on Dependable and Secure Computing
  https://www.computer.org/csdl/journal/tq
- IEEE Security & Privacy www.computer.org/security-and-privacy
- IEEE Computer www.computer.org/computer
- IEEE Transactions on Computers http://www.computer.org/web/tc
- IEEE Transactions on Education
  https://ieeexplore.ieee.org/xpl/aboutJournal.jsp?punumber=13
- IEEE Transactions on Cloud Computing https://www.computer.org/web/tcc
- IEEE Transactions on Engineering Management
  https://www.ieee-tems.org/ieee-transactions-on-engineering-management/
- IEEE Embedded Systems Letters,
  https://ieee-ceda.org/publication/ieee-embedded-systems-letters-esl
- ACM Transactions on Cyber-Physical Systems http://tcps.acm.org
- ACM Transactions on Privacy and Security https://tops.acm.org/
- Computers & Security, Elsevier www.journals.elsevier.com/computers-and-security
- IEEE Access http://ieeeaccess.ieee.org
- Future Internet, MDPI https://www.mdpi.com/journal/futureinternet
- Journal of Forensic and Legal Medicine, Elsevier
  https://www.journals.elsevier.com/journal-of-forensic-and-legal-medicine
- Journal of Network and Computer Application, Elsevier
  http://www.journals.elsevier.com/journal-of-network-and-computer-applications/
- Frontiers of Information Technology & Electronic Engineering, Springer
  https://www.springer.com/journal/11714/
- Crime Science, Springer https://crimesciencejournal.springeropen.com
- The Journal of Supercomputing, Springer https://link.springer.com/journal/11227
- IETE Technical Review Journal http://tr.ietejournals.org
- International Journal of Network Security http://ijns.femto.com.tw
- Journal of Applied Mathematics, Hindawi http://www.hindawi.com/journals/jam/
- MDPI Future Internet http://www.mdpi.com/journal/futureinternet
- Journal of Defense Modeling and Simulation, SAGE Publications,
  https://journals.sagepub.com/home/dms
- Security and Communication Networks, Wiley
  http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1939-0122
- Engineering Reports, Wiley https://onlinelibrary.wiley.com/journal/25778196
- Computer Communications, Elsevier
  https://www.journals.elsevier.com/computer-communications

Book Proposal Reviewer

- Cybersecurity and Digital Forensics for the (Criminal Justice and other) Nontechnical Major(s), Jones & Bartlett Learning, 2019.
- Cyber Security And Applications, CRC Press, 2020

University/College/Department Service

Virginia Commonwealth University:

- *Search Committee Member for the Department Chair of Computer Science*, 2021-2022
- *Team Lead* to apply for the DHS/NSA National Center for Academic Excellence in Research (CAE-R), 2020
- *Team Member* to apply for the DHS/NSA National Center for Academic Excellence in Cyber Defense (CAE-CD), 2019
- *Graduate Committee Member* to oversee master and PhD programs, 2018-to-date
- *Team Member of High School Programming Contest* to organize the VCU annual programming contest, 2018-to-date
- *Search Committee Chair for Adjunct Faculty* to find a suitable adjunct faculty candidate for the CS department, 2021

- *Search Committee Member for Tenure-track Faculty* to find a suitable tenure-track faculty candidate for the CS department, 2019-2021
- Midterm Tenure Review Committee Member, 2022

`University of New Orleans:`

- *Faculty Search Committee Member* to find a suitable faculty candidate for the CS department, 1 year (2017 - 2018)
- *Departmental Seminar Coordinator* to organize departmental seminars regularly, 3 years (2014-2017)
- *Graduate Grade Appeal Committee* to resolve grading issues raised by a student, 4 years (2014-2018)
- *Undergraduate Grade Appeal Committee* to resolve grading issues raised by a student, 4 years (2014-2018)
- *Team Member* to apply for the DHS/NSA National Center for Academic Excellence in Research (CAE-R), 2013
- *Team Member* to apply for the DHS/NSA National Center for Academic Excellence in Cyber Operations (CAE-CO), 2014