

# CIHAN TUNC

## CONTACT INFO

---

Assistant Professor  
Smart Cyber Space Group  
Department of Computer Science & Engineering  
University of North Texas, Denton, Texas USA

[Cihan.Tunc@UNT.edu](mailto:Cihan.Tunc@UNT.edu)  
[www.cihantunc.com](http://www.cihantunc.com)  
<https://scs.engineering.unt.edu/>  
<https://tinyurl.com/CihanTunc-GoogleScholar>

## RESEARCH INTERESTS

---

• Cybersecurity • Cyber-resiliency • Intrusion detection/prevention systems • Cloud computing • Internet of Things (IoT) • Unmanned Vehicles (UVs) • Zero Trust Architecture • Cyber-threat analysis in social media

## EDUCATION

---

**University of Arizona, Tucson, AZ** **Aug 2011 – Jan 2015**  
Ph.D. in Computer Engineering (Electrical and Computer Engineering)  
Dissertation: “Autonomic Cloud Resource Management”  
Research: Autonomic Power, Performance, and Security Management for Cloud Systems  
Advisors: Salim Hariri and Ali Akoglu

**Northeastern University, Boston, MA** **Sep 2008 – May 2010**  
M.Sc. in Computer Engineering (Electrical and Computer Engineering)  
Thesis: “Variation and Defect Tolerance for Nano Crossbars”  
Advisor: Mehdi B. Tahoori

**Bahcesehir University, Istanbul, Turkey** **Sep 2003 – Jun 2008**  
B.Sc. in Electrical & Electronics Engineering  
Graduation Project: “Carry Save Tree Generation”  
Advisor: H. Fatih Ugurdag

## RESEARCH FUNDING AND GRANTS

---

### Current Funding

- **National Science Foundation (NSF)**, “*REU: TaMaLe – Testing and Machine Learning for Context-Driven Systems*,” R. Bryce (PI) and **C. Tunc (PI)**, Total Budget: \$405,000 USD

### Past Funding

- **Naval Air Warfare Center (Aircraft Division)**, SBIR N211-058 “*Autonomic Protection for UMAA services*,” S. Hariri (PI), **C. Tunc (Co-PI)**, Sub-Budget: \$40,000 (Total Budget: \$120,000 USD), Award Period: 14/07/2021 – 01/24/2022
- **Siemens Corporation, Technology**, “*Model Extraction for Zero-Trust Architecture (ZTA) based Internet of Things (IoT) Compliance*,” **C. Tunc (PI)**, Budget: \$43,642 USD, Award Period: 07/01/2021 – 12/31/2021
- **University of North Texas**, “*Junior Faculty Summer Research Grant*,” **C. Tunc (PI)**, Total Budget: \$5,000 USD, Period: 06/01/2021 – 08/01/2021
- **University of North Texas**, “*Faculty First Flight*,” **C. Tunc (PI)**, Total Budget: \$500 USD, Period: 06/01/2021 – 12/31/2021

- **AF Office of Scientific Research**, “*Resilient DDDAS-based Cloud Services (rDaaS) for Cyber Battle Management Systems*,” S. Hariri (PI), **C. Tunc (Co-PI)**, Total Budget: \$453,404 USD (Perc: 50%), Period: 06/15/2018 - 06/14/2021
- **National Science Foundation**, “*FCTaaS: Federated Cybersecurity Testbed as a Service*,” S. Hariri (PI), **C. Tunc (Co-PI)**, Total Budget: \$300,000 USD (Perc: 11%), Award Period: 10/01/2018 - 09/30/2020
- **National Institute of Standards and Technology**, “*Resilient Application as a Service (RAaaS)*,” S. Hariri (PI), **C. Tunc (Co-PI)**, Total Budget: \$150,000 USD (Perc: 50%), Award Period: 06/01/2018 - 05/31/2020
- **National Institute of Standards and Technology (NIST)**, “*Resilient Cloud Services (RCS): Design, Analysis, and Deployment*,” S. Hariri (PI), **C. Tunc (Co-PI, 20%)**, Total Budget: \$50,000 USD (Perc: 20%), Period: 05/01/2016 - 04/30/2017

### Contributed Funding

- **Department of Energy, National Nuclear Security Administration (NNSA)**, “*Partnership for Proactive Cybersecurity Research and Training (PACT)*,” S. Hariri (PI), T. Bose (Co-PI), G. Ditzer (Co-PI), D. Rawat (Co-PI), F. Stomp (Co-PI), **C. Tunc (Senior Personnel)**, DOE/NNSA National Lab Collaborator: Dr. Charlie Catlett (Argonne National Laboratory), Budget: \$3,000,000 USD, Award Period: 10/1/2019 - 10/1/2022
- Multiple **SBIR/STTR** proposals together with Avirtek (from The University of Arizona) (received multiple Phase I and II awards); e.g., “*RMS - Resilient Middleware Services for Cyber Physical Systems*”, “*Multi-Layer Mapping of Cyberspace*”, “*Autonomic Monitoring, Analysis, and Protection (AMAP)*”, “*Tactical Immune System (TIS)*” (~\$3,800,000 USD budgeted, I have been serving as a Senior Personnel)

## PUBLICATIONS

---

### Thesis & Dissertation [TD]

- [TD1] **C. Tunc**, “*Autonomic Cloud Resource Management*,” **PhD Dissertation**, Jan 2015.  
 [TD2] **C. Tunc**, “*Variation and Defect Tolerance for Nano Crossbars*,” **MS Thesis**, May 2010.

### Text Book [TB]

- [TB1] S. Hariri and **C. Tunc**, “*High Performance Distributed Computing Systems: Architecture, Networking, and Programming*,” Sentia Publishing, ISBN: 978-0-9990053-2-3, 2017.

### Book Chapters [BC]

- [BC1] J. Pacheco, **C. Tunc**, and S. Hariri, “*Smart Cities*,” in “*Cyber Resilience of Systems and Networks*,” Springer, ISBN: 978-3-319-77491-6, 2019.  
 [BC2] **C. Tunc**, S. Hariri, and A. Battou, “*A Design Methodology for Developing Resilient Cloud Services (RCS)*,” in “*Handbook of System Safety and Security: Cyber Risk and Management, Cyber Security, Threat Analysis, Functional Safety, Software Systems, and Cyber Physical Systems*,” edited by Edward Griffor, Elsevier Inc., ISBN: 978-0-12-803773-7, 2016.

### Journals and Magazines [J]

- [J1] C. Wu, S. Shao, **C. Tunc**, P. Satam, and S. Hariri, “*An explainable and efficient deep learning framework for video anomaly detection*.” *Cluster Computing*, 2021, pages 1-23.  
 [J2] S. Shao, **C. Tunc**, A. Al-Shawi, and S. Hariri, “*An Ensemble of Ensembles Approach to Author Attribution for Internet Relay Chat Forensics*,” *ACM Transactions on Management Information Systems (TMIS)* 11, no. 4 (2020): 1-25.  
 [J3] **C. Tunc**, D. Machovec, N. Kumbhare, A. Akoglu, S. Hariri, and H.J. Siegel, “*Value of Service Based Resource Management for Large-Scale Computing Systems*,” *Springer Cluster Computing*, vol. 20, no. 3, pp. 2013-2030, Sep. 2017.

- [J4] J. Pacheco, **C. Tunc**, P. Satam, and S. Hariri, “*Secure and Resilient Cloud Services for Enhanced Living Environments*,” IEEE Transactions on Cloud Computing, Special Issue on Enhanced Living Environments: Algorithms, Architectures and Platforms (Cloud4ELE), vol. 3, no. 6, pp. 44-52, Nov. 2016.
- [J5] D. Machoveca, B. Khemkaa, N. Kumbhare, S. Pasrichaa, A.A. Maciejewska, H.J. Siegel, A. Akoglu, G.A. Koenig, S. Hariri, **C. Tunc**, M. Wright, M. Hilton, R. Rambharos, C. Blandin, F. Fargo, A. Louri, and N. Imam, “*Utility-Based Resource Management in an Oversubscribed Energy-Constrained Heterogeneous Environment Executing Parallel Applications*,” Elsevier Parallel Computing (ParCo), Nov. 2016.
- [J6] S. Hariri, J. Pacheco, **C. Tunc**, and Y. Al-Nashif, “*A Methodology for Designing Resilient and Smart Critical Infrastructures*,” Electrical and Computer Engineering Department Heads Association, 2015.
- [J7] **C. Tunc** and S. Hariri, “*CLaaS: Cybersecurity Lab as a Service*,” Journal of Internet Services and Information Security (JISIS), vol. 5, no. 4, pp. 41-59, Nov. 2015.

### Conferences and Workshops [C]

- [C1] A. Alshehri, and **C. Tunc**, “Zero Trust Engine for IoT Environments,” 2023 20th ACS/IEEE International Conference on Computer Systems and Applications (AICCSA), pp. 1-3. IEEE, 2023.
- [C2] S. Shaik, **C. Tunc**, and K. Morozov, “Intrusion Detection for Additive Manufacturing Systems and Networks,” 2023 20th ACS/IEEE International Conference on Computer Systems and Applications (AICCSA), pp. 1-3. IEEE, 2023.
- [C3] D. Petrou, V. Martinez-Gil, F. Castillo, **C. Tunc**, and R. Bryce, “Twitter Account Analysis for Drug Involvement Detection,” 2023 3rd Intelligent Cybersecurity Conference (ICSC), pp. 9-16. IEEE, 2023.
- [C4] H. Namdari, **C. Tunc**, and R. Dantu. “Phoenix: IoT Trust Evaluation Using Game Theory with Second Chance Protocol,” 2023 10th International Conference on Internet of Things: Systems, Management and Security (IOTSMS), pp. 117-124. IEEE, 2023.
- [C5] Putnam, Evan Blake, Dylan Nihal Senarath, Giselle Ramirez Urquijo, Cihan Tunc, and Renee Bryce. "A Lightweight Drone Simulator." In 2023 Tenth International Conference on Software Defined Systems (SDS), pp. 52-59. IEEE, 2023.
- [C6] B. Tufekci, **C. Tunc** and R. Dantu, “*Efficient Motion Control Strategy for Drone Swarms*,” 10th International Conference on Recent Advances in Air and Space Technologies (RAST), Istanbul, Turkiye, 2023, pp. 01-06, doi: 10.1109/RAST57548.2023.10198007.
- [C7] **C. Tunc**, J. Durflinger, C. Mahmoudi and V. Formicola, “*Autonomic ZTA-based Network Management Engine (AZNME)*,” 2022 IEEE International Symposium on Software Reliability Engineering Workshops (ISSREW), Charlotte, NC, USA, 2022, pp. 25-30, doi: 10.1109/ISSREW55968.2022.00034.
- [C8] **C. Tunc** and S. Hariri, “*Self-Protection for Unmanned Autonomous Vehicles (SP-UAV): Design Overview and Evaluation*,” 2022 IEEE International Conference on Autonomic Computing and Self-Organizing Systems Companion (ACSOS-C), CA, USA, 2022, pp. 128-132.
- [C9] **C. Tunc**, J. Durflinger, C. Mahmoudi and V. Formicola, “*Autonomic ZTA-based Network Management Engine (AZNME)*,” 2022 IEEE International Symposium on Software Reliability Engineering Workshops (ISSREW), Charlotte, NC, USA, 2022, pp. 25-30.
- [C10] B. Tufekci, and **C. Tunc**, “*Vulnerability and Threat Analysis of UAVs*,” 2021 IEEE/ACS 18<sup>th</sup> International Conference on Computer Systems and Applications (AICCSA), pp. 1-2. IEEE, 2021.
- [C11] H. Namdari, and **C. Tunc**, “*Toward Resilience Methods in Cloud Computing*,” 2021 IEEE/ACS 18<sup>th</sup> International Conference on Computer Systems and Applications (AICCSA), pp. 1-2. IEEE, 2021.
- [C12] S. Shao, P. Satam, S. Satam, K. AI-Awady, G. Ditzler, S. Hariri, **C. Tunc**, “*Multi-Layer Mapping of Cyberspace for Intrusion Detection*,” 2021 IEEE/ACS 18<sup>th</sup> International Conference on Computer Systems and Applications (AICCSA), IEEE, 2021.
- [C13] F. Fargo, O. Franza, **C. Tunc**, and S. Hariri, “*VM Introspection-based Allowlisting for IaaS*,” In 2020 7<sup>th</sup> International Conference on Internet of Things: Systems, Management and Security (IOTSMS), pp. 1-4. IEEE, 2020.

- [C14] C. Wu, S. Shao, **C. Tunc**, and S. Hariri, “*Video anomaly detection using pre-trained deep convolutional neural nets and context mining*,” 2020 IEEE/ACS 17<sup>th</sup> International Conference on Computer Systems and Applications (AICCSA), pp. 1-8. IEEE, 2020.
- [C15] L. Yao, **C. Tunc**, P. Satam, and S. Hariri, “*Resilient Machine Learning (rML) Ensemble Against Adversarial Machine Learning Attacks*,” International Conference on Dynamic Data Driven Application Systems, pp. 274-282. Springer, Cham, 2020.
- [C16] S. Shao, **C. Tunc**, A. Al-Shawi, and S. Hariri, “*Automated Twitter Author Clustering with Unsupervised Learning for Social Media Forensics*,” 16<sup>th</sup> ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2019), Abu Dhabi, UAE, Nov. 2019.
- [C17] S. Shao, **C. Tunc**, A. Al-Shawi, and S. Hariri, “*One-class Classification with Deep Autoencoder Neural Networks for Author Verification in Internet Relay Chat*,” 16<sup>th</sup> ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2019), Abu Dhabi, UAE, Nov. 2019.
- [C18] J. H. Pacheco Ramirez, V. Benitez, **C. Tunc**, and C. Grijalva Lugo, “*Anomaly Behavior Analysis for Fog Nodes Availability Assurance in IoT Applications*,” Workshop on Automation of Cloud Configuration and Operations (ACCO 2019), co-located with AICCSA 2019, Abu Dhabi, UAE, Nov., 2018.
- [C19] F. Fargo, O. Franza, **C. Tunc**, and S. Hariri, “*Autonomic Resource Management for Power, Performance, and Security in Cloud Environment*,” Workshop on Automation of Cloud Configuration and Operations (ACCO 2019), co-located with AICCSA 2019, Abu Dhabi, UAE, Nov., 2018.
- [C20] M. Merzouki, C. Mahmoudi, R. Bohn, **C. Tunc**, “*Security Automation for Cloud-Based IoT Platforms*,” The 2019 IEEE International Conference on Internet of Things, Atlanta, USA, Jul. 2019.
- [C21] J. Bernard, S. Shao, **C. Tunc**, H. Kheddouci, and S. Hariri, “*Quasi-Cliques Analysis for IRC Channel Thread Detection*,” Complex Networks 2018, UK, Dec. 2018.
- [C22] S. Shao, **C. Tunc**, and S. Hariri, “*Autonomic Author Identification in Internet Relay Chat (IRC)*,” 15<sup>th</sup> ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2018), Aqaba, Jordan, Nov. 2018.
- [C23] J. Pacheco, **C. Tunc**, and S. Hariri, “*Security Framework for IoT Cloud Services*,” Workshop on Automation of Cloud Configuration and Operations (ACCO 2018), Jordan, Oct.-Nov., 2018.
- [C24] M. Yang, I.B. Djordjevic, **C. Tunc**, S. Hariri, and A. Akoglu, “*An Optical Interconnect Network Design for Dynamically Composable Data Centers*,” 19<sup>th</sup> IEEE International Conference on High Performance Computing and Communications (HPCC 2017), Bangkok, Thailand, Dec. 2017,
- [C25] N. Kumbhare, **C. Tunc**, D. Machovec, A. Akoglu, S. Hariri, and H.J. Siegel, “*Value-Based Scheduling for Oversubscribed Power-Constrained Homogeneous HPC Systems*,” IEEE International Conference on Cloud and Autonomic Computing (ICCAC 2017), Tucson, Arizona, USA, Sep. 2017.
- [C26] **C. Tunc**, S. Hariri, and Y. Badr, “*Resilient Dynamic Data Driven Application Systems as a Service (rDaaS): A Design Overview*,” Workshop on InfoSymbiotics: DDDAS Dynamic Data Driven Applications Systems (InfoSymbiotic:DDDAS17) in IEEE International Conference on Cloud and Autonomic Computing (ICCAC 2017), Tucson, Arizona, USA, Sep. 2017.
- [C27] S. Shao, **C. Tunc**, P. Satam, and S. Hariri, “*Real-time IRC Threat Detection Framework*,” The 1<sup>st</sup> International Workshop on Autonomics and Cloud Security (ACS) in IEEE International Conference on Cloud and Autonomic Computing (ICCAC 2017), Tucson, Arizona, USA, Sep. 2017.
- [C28] **C. Tunc**, S. Hariri, M. Merzouki, C. Mahmoudi, F.J. de Vault, J. Chbili, R. Bohn, and A. Battou, “*Cloud Computing Security Automation Framework*,” The 1<sup>st</sup> International Workshop on Autonomics and Cloud Security (ACS) in IEEE Intn’l Conference on Cloud and Autonomic Computing (ICCAC 2017), Tucson, Arizona, USA, Sep. 2017.
- [C29] **C. Tunc**, F. Fargo, Y. Al-Nashif, and S. Hariri, “*Autonomic Cross-Layer Management of Cloud Resources Framework*,” The IEEE Workshop on Automation of Cloud Configuration and Operations (ACCO 2017) in IEEE International Conference on Cloud and Autonomic Computing (ICCAC 2017), Tucson, Arizona, USA, Sep. 2017.
- [C30] A.T. Ozdemir, **C. Tunc**, and S. Hariri, “*Autonomic Fall Detection System*,” The IEEE Workshop on Automation of Cloud Configuration and Operations (ACCO 2017) in IEEE International Conference on Cloud and Autonomic Computing (ICCAC 2017), Tucson, Arizona, USA, Sep. 2017.

- [C31] N. Kumbhare, **C. Tunc**, S. Hariri, I. Djordjevic, A. Akoglu, and H.J. Siegel, “*Just In Time Architecture (JITA) for Dynamically Composable Data Centers*,” 13<sup>th</sup> ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2016), Agadir, Morocco, Nov. 2016,
- [C32] **C. Tunc**, N. Kumbhare, A. Akoglu, S. Hariri, D. Machovec, and H.J. Siegel, “*Value of Service Based Task Scheduling for Cloud Computing Systems*,” IEEE International Conference on Cloud and Autonomic Computing (ICCAC 2016), Augsburg, Germany, Sep. 2016.
- [C33] J. Yu, **C. Tunc**, and S. Hariri, “*Automated Framework for Scalable Collection and Intelligent Analytics of Hacker IRC Information*,” IEEE International Conference on Cloud and Autonomic Computing (ICCAC 2016), Augsburg, Germany, Sep. 2016.
- [C34] S. Gu, L. Yao, **C. Tunc**, A. Akoglu, S. Hariri, and E. Ritchie, “*An Autonomic Workflow Performance Manager for Weather Research and Forecast Workflows*,” IEEE International Conference on Cloud and Autonomic Computing (ICCAC 2016), Augsburg, Germany, Sep. 2016.
- [C35] J. Pacheco, **C. Tunc**, and S. Hariri, “*Design and Evaluation of Resilient Infrastructures Systems for Smart Cities*,” IEEE International Smart Cities Conference (ISC2), Trento, Italy, Sep. 2016.
- [C36] D. Machovec, **C. Tunc**, N. Kumbhare, B. Khemka, A. Akoglu, S. Hariri, and H.J. Siegel, “*Value-Based Resource Management in High-Performance Computing Systems*,” 7<sup>th</sup> ACM Workshop on Scientific Cloud Computing (ScienceCloud’16), Kyoto, Japan, Jun. 2016.
- [C37] S. Hariri, **C. Tunc**, P. Satam, F. Al-Moualem, and E. Blasch, “*DDDAS-Based Resilient Cyber Battle Management Services (D-RCBMS)*,” IEEE 22<sup>nd</sup> International Conference on High Performance Computing Workshops (HiPCW), Bangalore, India, Dec. 2015.
- [C38] J.H. Pacheco Ramirez, B. AlBaalbaki, **C. Tunc**, S. Hariri, and Y. Al-Nashif, “*Anomaly Behavior Analysis System for ZigBee in Smart Buildings*,” 12<sup>th</sup> ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2015), Marrakech, Morocco, Nov. 2015.
- [C39] **C. Tunc**, S. Hariri, F. Montero, F. Fargo, and P. Satam, “*CLaaS: Cybersecurity Lab as a Service -- Design, Analysis, and Evaluation*,” IEEE International Conference on Cloud and Autonomic Computing (ICCAC 2015), Boston, MA, USA, Sep. 2015.
- [C40] **C. Tunc**, S. Hariri, Y. Al-Nashif, F. Montero, F. Fargo, and P. Satam, “*Teaching and Training Cybersecurity as a Cloud Service*,” IEEE International Workshop on Autonomic Cloud Cybersecurity (ACC 2015) in 2015 International Conference on Cloud and Autonomic Computing (ICCAC 2015), Boston, MA, USA, Sep. 2015.
- [C41] B. Khemka, D. Machovec, C. Blandin, H.J. Siegel, S. Hariri, A. Louri, **C. Tunc**, F. Fargo, and A.A. Maciejewski. “*Resource Management in Heterogeneous Parallel Computing Environments with Soft and Hard Deadlines*,” The XI Metaheuristics International Conference (MIC 2015), Agadir, Morocco, Jun. 2015.
- [C42] **C. Tunc**, F. Fargo, Y. Al-Nashif, S. Hariri, and J. Hughes, “*Autonomic Resilient Cloud Management (ARCM): Design and Evaluation*,” 2014 International Conference on Cloud and Autonomic Computing (CAC 2014), London, United Kingdom, Sep. 2014.
- [C43] F. Fargo, **C. Tunc**, Y. Al-Nashif, A. Akoglu, and S. Hariri, “*Autonomic Workload and Resources Management of Cloud Computing Services*,” 2014 International Conference on Cloud and Autonomic Computing (CAC 2014), London, United Kingdom, Sep. 2014.
- [C44] F. Fargo, **C. Tunc**, Y. Al-Nashif, and S. Hariri, “*Autonomic Performance-per-Watt Management (APM) of Cloud Resources and Services*,” ACM Cloud and Autonomic Computing Conference, Miami, Florida, USA, Aug. 2013.
- [C45] B. Yuce, S. Korkmaz, V.B. Esen, F. Temizkan, **C. Tunc**, G. Guner, I.F. Baskaya, I. Agi, G. Dunder, and H.F. Ugurdag, “*Synthesis of Clock Trees for Sampled-Data Analog IC Blocks*,” East-West Design & Test Symposium, Rostov-on-Don, Russia, Sep. 2013.
- [C46] F. Ugurdag, O. Keskin, **C. Tunc**, F. Temizkan, G. Fici, and S. Dedeoglu, “*RoCoCo: Row and Column Compression for High-Performance Multiplication on FPGAs*,” East-West Design & Test Symposium, Sevastopol, Ukraine, Sep. 2011 (*outstanding paper award*).
- [C47] **C. Tunc** and M.B. Tahoori, “*On-the-fly Variation Tolerant Mapping in Crossbar Nano-Architectures*,” IEEE VLSI Test Symposium (VTS), Santa Cruz, California, USA, Apr. 2010.

- [C48] **C. Tunc** and M.B. Tahoori, “*Variation Tolerant Logic Mapping for Crossbar Array Nano Architectures*,” IEEE Asia and South Pacific Design Automation Conference (ASP-DAC), Taipei, Taiwan, Jan. 2010.

## **WORK EXPERIENCE**

---

### **The University of North Texas, Denton, Texas**

#### **Assistant Professor**

**Aug 2020 – Present**

#### **Research:**

- Research interests include cybersecurity, cloud computing, autonomic computing, cloud resiliency, cyber-threat analysis and prevention systems, Internet of Things (IoT), industrial IoT (IIoT), Unmanned Vehicles (UV) including drones and their management and security, power and performance management for large-scale systems, social media analysis for cyber-threats.
- Director of Smart Cyber Space (SCS) group as a part of Network Security Lab.
- Supervising graduate and undergraduate students.
- Development of research projects (ref: Projects) and writing technical proposals (ref: Funding & Grants).

#### **Teaching:**

- CSCE 3560/5562 – Cloud Security (Spring 2024): 29 students
- CSCE 5550 – Introduction to Computer Security (Fall 2023): 62 students
- CSCE 5933 – Topics in CSCE (Spring 2023): 12 students
- CSCE 3560 – Computer Systems Security (Spring 2023): 27 students
- CSCE 5550 – Introduction to Computer Security (Fall 2022): 74 students
- CSCE 5933 – Topics in CSCE (Spring 2022): 11 students
- CSCE 3560 – Computer Systems Security (Spring 2022): 16 students
- CSCE 3600 – Principles of Systems Programming (Fall 2021): 48 students
- CSCE 5550 – Introduction to Computer Security (Spring 2021): Hybrid due to COVID-19, 63 students
- CSCE 5550 – Introduction to Computer Security (Fall 2020): Online due to COVID-19, 18 students

#### **Service:**

- MS in Cybersecurity program director: June 2022 – Present
- CSE PhD Admission Committee: Sep 2022 – Present
- Cybersecurity committee member: Aug 2020 – Present
- Distinguished Speaker Organizer: Aug 2021 – Present
- Grade Appeal committee member: Aug 2021 – Present
- Clinical Professor Search committee member: Oct 2021 – Dec 2021

### **The University of Arizona, Tucson, Arizona**

#### **Research Assistant Professor**

**May 2015 – Aug 2020**

#### **Research:**

- Autonomic computing, cloud resiliency, cybersecurity, cyber-threat analysis and prevention systems, Cybersecurity Lab as a Service (CLaaS), Internet of Things (IoT), power and performance management for large-scale systems. (For more information, please refer to the Projects section)
- Development of research projects and assisting in and writing technical proposals.
- Coordination of various international conferences, workshops, meetings.
- Management and maintenance of the platforms and infrastructures at the Autonomic Computing Lab (ACL).
- Assist in developing cybersecurity, cloud, IoT based testbeds for research and experimentation.

#### **Teaching:**

- ECE 509 – Cybersecurity: Concept, Theory, and Practice (Fall 2019): Completely online, 19 students

- Co-instructor (together with Prof. Salim Hariri):
  - ECE 524 – Fundamentals of Cloud Security (Spring 2018): 42 students
  - ECE 677 – Distributed Computing System (Fall 2017): 25 students
  - ECE 677 – Distributed Computing System (Fall 2016): 28 students
  - ECE 677 – Distributed Computing System (Fall 2016): 27 students
  - ECE 509 – Cybersecurity: Concept, Theory, and Practice (Spring 2018): 30 students
  - ECE 509 – Cybersecurity: Concept, Theory, and Practice (Spring 2017): 32 students
  - ECE 509 – Cybersecurity: Concept, Theory, and Practice (Spring 2016): 39 students
  - ECE 509 – Cybersecurity: Concept, Theory, and Practice (Spring 2015): 41 students
- Supervision/mentoring graduate- (both PhD and MS) and undergraduate-level students (ref: Educational Activities)

**National Institute of Standards and Technology (NIST), Gaithersburg, Maryland**

**Guest Researcher**

**Sep 2016 – May 2017**

- Research and development on the cloud computing system management and security automation.
- Data collection from all the entities in a cyber-environment for the analysis and security.

**Avirtek, Inc., Tucson, Arizona**

**Research Scientist Consultant**

**May 2015 – May 2017**

- Avirtek AIM (Automated & Integrated Management) system development and integration.
- Automation of the system installation and configuration.
- Development of new technologies for Avirtek systems
  - Securing commercial AIM products that operate under a licensed environment only.
  - Building autonomic computing-based management modules.
  - Collection of the cyber-environment data including network, computers, and users.
- Guiding/mentoring software engineers.
- Assisting in the preparation of the proposals between Avirtek and The University of Arizona.

**The University of Arizona, Tucson, Arizona**

**Graduate Research Assistant**

**Aug 2011 – Jan 2015**

- Research on autonomic power and performance management for cloud computing systems.
- Development of AskCyPert – Cybersecurity as a Service (CLaaS) backend.
- Research and development of acceleration of hypothetical LDPC decoders using FPGAs.
- Responsible for the platforms and infrastructures of the ACL lab at The University of Arizona.

**Graduate Teaching Assistant**

**Aug 2013 – Dec 2014**

- Teaching MPI and OpenMP for “ECE677 – Distributed Computing System” (Fall 2013 and Fall 2014). Responsibilities included setup, configuration, and maintenance of the systems required during the class, as well as grading homework, term papers, and projects.
- Grading homework and projects for “ECE506 – Reconfigurable Computing” (Spring 2014).

**Samsung Research America, Dallas, Texas**

**R&D Engineering Intern**

**May 2013 – Aug 2013**

- Design and optimization of a MIMO detector architecture based on K-Best algorithm for Xilinx Virtex-6 (XCVLX550T) to be used in next-generation WiFi systems.
- Implementation of the required blocks using Verilog and Xilinx CoreGen to achieve very high throughput.
- Optimization of the algorithm and implementation for the high-performance requirements.

**Ozyegin University, Istanbul, Turkey**

**Research Assistant**

**Sep 2010 – Aug 2011**

- Research on computer arithmetic, specifically on row and column compressors, to accelerate the summation and multiplication operations.

**Instructor/Teaching Assistant**

**Jan 2011 – Jul 2011**

- Teaching 23 high-school students on making a line-following robot (its designing, electronics components, and programming) in two weeks from scratch during RoboKamp at 2011.
- Grading and assisting Java based “CS 101 – Computer Programming”.
- Assisting “EE 564 – Computer Architecture & Performance”.

**Vestel Corporation, Manisa, Turkey**

Lab Instructor

**Sep 2010 – Dec 2010**

- Instruction of lab session of the “Embedded Systems Design” course, which included Computer Architecture, PIC programming, and Embedded System Design using FriendlyARM boards.

**Northeastern University, Boston, MA**

**Research Assistant**

**Sep 2008 – May 2010**

- Research on “Variation and Defect Tolerance for Nano Crossbars”, *(Please refer to the Projects section)*

**Teaching Assistant**

**Sep 2008 – May 2010**

- Instruction “EECE 2413 – Electronics Lab” (Fall 2009 and Spring 2010).
- Grading “EECE 3324 – Computer Architecture and Organization” (Spring 2009).
- Grading “EECE 2312 – Digital Logic Design” (Fall 2008).

**Bahcesehir University, Istanbul, Turkey**

Undergraduate Lab Assistant

**Feb 2007 – Jun 2007**

- Research on FPGA design and design automation.
- Helping students in the FPGA-based “Digital System Design Lab” (Fall 2007).

**RELATED RESEARCH PROJECTS**

---

**Management and Threat Analysis of Unmanned Vehicles (UVs)**

**Aug 2021 – Present**

- Threat analysis of Unmanned Vehicles (UVs) with a focus on aerials (UAVS, a.k.a. drones).
- Detection and prevention of cyberattacks through intrusion detection and prevention systems.
- Resiliency methods to prevent failures, faults, and cyberattacks.
- Autonomic management techniques to control UVs in a resource and energy constrained environment.

**Zero-Trust Architecture (ZTA) based Internet of Things (IoT) Compliance**

**Jul 2021 – Present**

- Extracting the capabilities of individual IoT devices to describe their requirement, capabilities, network connections, operations, etc. in a machine understandable language.
- Mapping IoT device capabilities and requirements to ZTA requirements.
- Monitoring and enforcing ZTA through network flow analysis as a demonstrative case.
- Collaboration with Siemens Corporation, Technology to apply to different IoT based environments.

**Cyber Threat Detection via Social Media Analysis**

**Aug 2015 – Present**

- Analysis and detection of activities and users in social media platforms (e.g., Internet Relay Chat (IRC) and Twitter).
- Guided and collaborated with graduate students in the development and research of the architecture that includes autonomic bot services, activity analysis, user identification and detection, sentimental analysis.
- Autonomic bot services monitor the IRC channels and Twitter accounts continuously and Stanford CoreNLP sentiment analysis was used for user intent, IBM Watson for personality analysis, etc.
- We were able to predict the WannaCry ransomware issue almost one month in advance as there was a high traffic regarding to the EternalBlue exploitation.



- Different machine learning algorithms are combined to create user identification and analysis.
- Collaborated on the development of graph theory algorithms that are used to create the hidden connections between the active users.

### **Resilient Cloud Services**

**Jan 2014 – Present**

- Developed a framework using Moving Target Defense (MTD) and software obfuscation for resilient cloud services.
- Built the approach using OpenStack on a private cloud environment as well as on AWS.
- For verification and evaluation, multiple MapReduce implementations (e.g., Hadoop and MRS-MapReduce), benchmarks, data mining tools have been developed.
- Implemented multiple attack scenarios (e.g., DoS/DDoS) including fork bombing, TCP/UDP flood, etc.
- The systems operate with negligible overhead under heavy attacks, which cause failure for non-resilient systems.

### **Autonomic Monitoring, Analysis, and Protection (AMAP)**

**Oct 2019 – Aug 2020**

- Continuously monitoring cyber resources and services to perform anomaly behavior analysis especially on different filetypes such as pdf, jpg, html, xml, rtf.
- Collaborating on the creation of the required modules such as continuous threat modeling, cyber situation awareness, anomaly behavior analysis, and intelligent cyber security assistant.
- Deploying at dynamic large-scale environments requires continuous threat modeling through high-performance computing paradigm, which I manage to be built using GPU systems when needed.

### **FCTaaS: Federated Cybersecurity Testbed as a Service**

**Aug 2018 – Aug 2020**

- Seamless composition of several heterogeneous testbeds to be ubiquitously accessed as a cloud service
- Developing integration of the distributed testbeds using Kafka, NTP, and a web interface
- Design and development of the required scheduling algorithms for cybersecurity experiments on distributed testbeds that are managed and controlled by different organizations
- Keeping the privacy and security of the users and distributed testbeds

### **Multi-Layer Anomaly Behavior Analysis (MLABA)**

**Jun 2018 – Aug 2020**

- Design and development of innovative data structures for cyberspace referred as Cyber-Persona footprint, Logical Resource Footprint, and Physical Resource Footprint
- Design and development of the footprint monitoring tool storing data using MongoDB
- Collaborated on the anomaly behavior analysis framework to create models using individual footprints and fusing them as needed. Currently mentoring a PhD student on the development of the logical and physical models.

### **Security Automation of Cloud Computing System**

**Sep 2016 – Sep 2018**

- Together with NIST, the research and development of the cloud computing system security automation based on NIST SP 800-53 (revision 4) security controls.
- Built a private cloud system using OpenStack and automated the management of the virtual machines (VMs).
- Automated the monitoring of the security control checks for the built cloud environment.

### **Autonomic Power & Performance Management for Cloud Resources**

**Aug 2012 – Aug 2018**

- Reducing power/energy consumption of cloud systems without sacrificing high-performance.
- VM resources are provisioned on runtime using AppFlow case-based reasoning and data mining.
- A private cloud environment was built using Xen on an IBM HS-22 blade server (and allocated 10 blades).

- Developed the monitoring tool to capture the VM resources utilization, the processes' resource usage, hypervisor's utilization, and the physical host system utilization.
- A performance-per-Watt-based autonomic resource management tool is developed.
- The system reduces power consumption up to 80% compared to static resources and up to 30% compared to other dynamic methods.

#### **Value of Service Based Task Scheduling for Cloud Computing Systems**

**Feb 2015 – Dec 2018**

- Task scheduling approaches to reduce total energy consumption while maintaining task performance.
- A power model has been created to predict the total energy consumption of the tasks running on the VMs.
- Value of Service concept that depends on the performance and energy values has been developed.
- Obtained an increase of the value gained by tasks' performance up to 50% and energy 40% compared to simple heuristics.

#### **AskCyPert – Cybersecurity as a Service (CLaaS)**

**Jan 2014 – May 2017**

- Aims to provide a virtual cybersecurity lab for the users around the globe with multiple experiment options.
- I built the CLaaS backend where VMs, vSwitches, vNetworks, etc. are created and configured for each experiment/testbed automatically using Perl SDK for VMware and VIX.
- In later stages, I have moved the environment to Amazon cloud systems (Amazon AWS Python SDK has been used) to provide high scalability.
- Developed network sniffing, TCP/IP attack, DNS attack, buffer overflow, and cross-site scripting attack labs.
- More than **400 students (worldwide)** have used the environment for multiple experiments.
- More information can be found on <http://askcypert.org/>

#### **Acceleration of Hypothetical LDPC Decoders using FPGAs**

**Jan 2012 – Sep 2013**

- Developed a tool to evaluate hypothetical LDPC decoders on any FPGA without user involvement by generating Verilog for any code-rate and code-length LDPC decoder.
- The tool synthesizes the generated Verilog codes using Xilinx ISE shell, uploads the bitstream to the FPGA for simulations, and extracts the Floor Error Rate and the codes that result in errors after the simulations.
- Fully serial architecture is included in the pre-defined architecture list.

#### **Row and Column Compressors for FPGAs and ASICs**

**Sep 2010 – Aug 2011**

- Built a framework for benchmarking various summation and multiplication methods.
- The framework generates Verilog RTLs and then tests the designs with testbenches. If the designs pass the testbench, they are synthesized using Xilinx ISE and/or Synopsys DC.

#### **Variation and Defect Tolerance for Nano Crossbars**

**Sep 2008 – May 2010**

- Developed variation- and defect-tolerant logic mapping algorithms for nano crossbars (e.g., simulated-annealing-based framework).
- Developed a characteristic testing approach for the fast-creating delay-based modeling for the nano crossbars.
- Enabled mapping a design on nano crossbars even under high defect and variation conditions (as high as 10%).

## POSTERS, PRESENTATIONS, TALKS

---

### Talks

- **Keynote Speaker:** “*Growing Concern of Information Technologies: Cybersecurity*”, *Intel Software Professionals Conference (SWPC)*, Online, Oct. 18, 2021
- **Keynote Speaker:** “*Cloud Computing & IoT Challenges and Approaches*,” 4<sup>th</sup> International Conference on Life and Engineering Sciences (ICOLES 2021), Online, Sep. 24, 2021
- **Invited Guest Speaker:** “*Cloud Computing for IoT: Challenges and Approaches*,” MS program in IoT and AI at Universidad de Sonora (University of Sonora), Online, Oct. 14, 2020
- **Talk:** “*Welcome to Cybersecurity*”, Navajo Technical University, Crownpoint, New Mexico, Dec. 2019
- **Talk:** “*Cloud Computing Infrastructure and Security*”, American University of Malta, Malta, Nov. 2019
- **Project presentation:** “*IRC User Identification for Threat Detection*”, Franco-American Workshop, Lyon, France, Jul. 2018
- **Project presentation:** “*Cloud Security Automation*”, Franco-American Workshop, Lyon, France, Dec. 2017
- **Project presentation:** “*IRC Chat Analysis for Hacker Behavior*”, Franco-American Workshop, Lyon, France, Dec. 2017
- **Invited speaker:** “*Cloud Computing Resiliency Through Dynamic Redundancy*,” Simposio Internacional de Ingeniería, Sistemas y Tecnología, Hermosillo, Mexico, Feb. 2014 (presentation)
- **Invited lecturer:** “*Parallel Distributed Computing*,” Simposio Internacional de Ingeniería, Sistemas y Tecnología, Hermosillo, Mexico, Feb. 2014
- **Talk:** “*Autonomic Computing Lab*,” Arizona GenCyber Cybersecurity Camp, The University of Arizona, 2014 and 2015 (talk)
- **Talk:** “*Autonomic Management and Cybersecurity*” during CAT Vehicle research experience for undergraduate program seminar talk, 2014, 2015, and 2017, PI: Jonathan Sprinkle

### Posters

- **C. Tunc**, S. Hariri, “*Autonomic Security Compliance Framework*”, NSF CAC Semiannual Meeting, Lubbock, Texas, Oct. 2017
- **C. Tunc**, S. Hariri, and F. Montero, “*Autonomic Security Compliance Engine (ASCE)*,” Semi-annual NSF Cloud and Autonomic Computing Center Meeting, Tucson, Arizona, Apr. 2017
- F. Fargo, **C. Tunc**, Y. Al-Nashif, S. Hariri, and A. Akoglu, “*Autonomic Cloud Management System*,” Franco-American Workshop, Tucson, Arizona, USA, 2014
- Z. Li, F. Fargo, **C. Tunc**, Y. Al-Nashif, S. Hariri, and A. Akoglu, “*Cloud Autonomic Manager (CAM)*”, NSF CAC Semiannual Meeting, Tucson, AZ, 2011

## PROFESSIONAL ACTIVITIES

---

### Journal Associate Editor

- Associate Editor for Springer Cluster Computing

### Journal Reviewer

- Springer Cluster Computing
- IEEE Transactions on Cloud Computing
- IEEE Pervasive Computing
- ACM Transactions on Management Information Systems
- Elsevier Computer Standards & Interfaces
- Elsevier Future Generation Computer Systems
- Elsevier Computers and Electrical Engineering
- Elsevier Computers & Security

- IEEE Transactions on Sustainable Computing

#### **Conference Program Chair & Co-Chair**

- Technical Program Co-Chair, *19<sup>th</sup> ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2022)*, Abu Dhabi, UAE, 2022
- Program Co-Chair, *The IEEE Workshop on Automation of Cloud Configuration and Operations (ACCO 2019, co-located with AICCSA 2019)*, Abu Dhabi, UAE, 2019
- Program Co-Chair, *The IEEE Workshop on Automation of Cloud Configuration and Operations (ACCO 2018, co-located with AICCSA 2018)*, Aqaba, Jordan, 2018
- Program Co-Chair, *The IEEE Workshop on Automation of Cloud Configuration and Operations (ACCO 2017, co-located with ICCAC 2017)*, Tucson, AZ, USA, 2017
- Program Co-Chair, *IEEE International Workshop on Big Data Analytics for Cybersecurity Computing (BDAC 2016, co-located with Intelligence and Security Informatics (ISI 2016))*, Tucson, AZ, USA, 2016

#### **Conference Chair**

- Registration, Finance, and Publication Chair, *20<sup>th</sup> ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2023)*, Egypt, 2023
- Publication chair, *19<sup>th</sup> ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2022)*, Abu Dhabi, UAE, 2022
- Online attendance and management, *18<sup>th</sup> ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2021)*, Morocco, 2021 (online)
- Registration, Finance, and Publication Chair, *18<sup>th</sup> ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2021)*, Morocco, 2021 (online)
- Local Chair, *17<sup>th</sup> ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2020)*, Antalya, Turkey, 2020 (Online)
- Registration, Finance, and Publication Chair, *17<sup>th</sup> ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2020)*, Antalya, Turkey, 2020 (Online)
- Publicity Chair, *The IEEE International Conference on Autonomic Computing and Self-Organizing Systems (ACSOS)*, Washington DC, 2020
- Registration, Finance, and Publication Chair, *16<sup>th</sup> ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2019)*, Abu Dhabi, UAE, 2019
- Proceedings Chair, *The International Conference on Big Data & Cybersecurity Intelligence (BDCSIntell'2018)*, Beirut, Lebanon, 2018
- Registration, Finance, and Publication Chair, *15<sup>th</sup> ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2018)*, Aqaba, Jordan, 2018
- Registration, Finance, and Publication Chair, *14<sup>th</sup> ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2017)*, Hammamet, Tunisia, 2017
- Registration, Finance, and Publication Chair, *IEEE International Conference on Cloud and Autonomic Computing (ICCAC 2017)*, Tucson, AZ, USA, 2017
- Registration, Finance, and Publication Chair, *13<sup>th</sup> ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2016)*, Agadir, Morocco, 2016
- Publication Chair, *IEEE International Conference on Cloud and Autonomic Computing (ICCAC 2016)*, Augsburg, Germany, 2016
- Registration and Finance Chair, *12<sup>th</sup> ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2015)*, Marrakech, Morocco, 2015
- Registration and Publication Chair, *IEEE International Conference on Cloud and Autonomic Computing (ICCAC 2015)*, Boston, MA, USA, 2015

#### **Conference Technical Program Committee member**

- 2022 IEEE International Conference on Cloud Computing (IEEE CLOUD 2022), Spain, 2022
- 21<sup>st</sup> EPIA Conference on Artificial Intelligence (EPIA 2022), Lisbon, Portugal, 2022
- 2021 Springer Symposium on Intelligent and Autonomous Systems (SIAS 2021), Tallinn, Estonia, 2021
- The 11<sup>th</sup> IEEE International Conference on Cloud Computing Technology and Science (CloudCom'19), Sydney, Australia, 2019
- 2018 Artificial Intelligence and Cloud Computing Conference (AICCC 2018), Tokyo, Japan, 2018
- IEEE Global Communications Conference 2018, UAE, 2018
- Foundation and Applications of Self\* Systems (FAS\* 2018) Posters and Demos Session, Trento, Italy, 2018
- 6<sup>th</sup> International Conference on Control Engineering & Information Technology (CEI'18), Istanbul, Turkey, 2018
- International Workshop on Architectures for Future Mobile Computing and Internet of Things (FMCIoT'2018), Tangier, Morocco, 2018
- 10<sup>th</sup> IEEE International Conference on Cloud Computing Technology and Science (CloudCom'18), Cyprus, 2018
- 9<sup>th</sup> IEEE International Conference on Cloud Computing Technology and Science (CloudCom'17), Hong Kong, 2017
- IEEE International Conference on Cloud and Autonomic Computing (ICCAC 2017), Tucson, AZ, USA, 2017
- IEEE International Workshop on Autonomic Cloud Cybersecurity (ACC 2015, co-located with ICCAC 2015), Boston, MA, USA, 2015

#### **Additional Duties**

- Subreviewer for various conferences, such as IEEE Global Communications Conference (GlobCom 2018), International World Wide Web Conference (WWW 2016), The International Conference on Information and Communication Systems (ICICS 2014 and 2015), International Conference on Very Large-Scale Integration (VLSI-SoC 2013, 2014, and 2015), NASA/ESA Conference on Adaptive Hardware and Systems (AHS 2013 and 2007)
- PhD forum mentor for the students attending AICCSA 2019 and AICCSA 2018

## **EDUCATIONAL ACTIVITIES**

---

#### **Currently Supervised Students**

- PhD: Burak Tufekci, "*UAV Security Framework*," University of North Texas, 2021 – Present
- PhD: Fatima Shibli, "*Drone Swarm Management and Security*," University of North Texas, 2024 – Present
- PhD: Amal Alshehri, "*Zero Trust based Security for IoT Environments*," University of North Texas, 2023 – Present
- PhD: Victor Morales, "*Trust Evaluation for Cloud Computing*," University of North Texas, 2023 – Present

#### **Alumni (Previously Supervised Students)**

- MS: Andy Fausak, Thesis: "*Crowd Counting Camera Array and Correction*," University of North Texas, 2023 – 2024
- MS: Andrew Fausak, Thesis: "*Malicious Intent Detection Framework for Social Networks*," University of North Texas, 2023 – 2024
- MS: James Durlinger, Thesis: "*Autonomic Zero Trust Framework for Network Protection*," University of North Texas, 2021 – 2022

### **Committee Member for**

- PhD: Deyuan Qu, supervisor: Prof. Qing Yan, University of North Texas
- PhD: Syed Badruddoja, supervisor: Prof. Ram Dantu, University of North Texas
- PhD: Fernando Mosquera Ferrandiz, supervisor: Prof. Krishna Kavi, University of North Texas
- PhD: Abiola Salau, supervisor: Prof. Ram Dantu, University of North Texas
- PhD: Kritagya Upadhyay, supervisor: Prof. Ram Dantu, University of North Texas
- PhD: Md Mosharaf Hossain, supervisor: Prof. Mark Albert, University of North Texas
- PhD: Alakananda Mitra, supervisor: Prof. Saraju Mohanty, University of North Texas
- PhD: Sukrutha L.T. Vangipuram, Prof. Saraju Mohanty, University of North Texas

### **Previously Co-Supervised Students**

- PhD: Sicong Shao, "*Understanding Cyber Attackers and Attacks via Social Media Analysis*," University of Arizona, 2016 – Present
- PhD: Likai Yao, "*Autonomic Workflow for Weather Research and Forecast Workflows*," University of Arizona, 2015 – Present
- PhD: Zhiwen Pan, "*A Context Aware Anomaly Behavior Analysis Methodology for Building Automation Systems*," University of Arizona, 2015 – 2017
- PhD: Jesus Pacheco, "*An Anomaly Behavior Analysis Methodology for the Internet of Things: Design, Analysis, and Evaluation*," University of Arizona, 2014 – 2017
- MSc: Birkan Kolcu, "*Seniors' Virtual Assistant via Artificial Emotional Intelligence*," University of Arizona, 2018 – Present
- MSc: Firas AlMoualem, "*SDR - Based Resilient Wireless Communications*," University of Arizona, 2015 – 2017
- MSc: Shuqing Gu, "*An Autonomic Workflow Performance Manager for Weather Forecast and Research Modeling Workflows*," University of Arizona, 2015 – 2017
- MSc: Bilal Al Baalbaki, "*Anomaly Behavior Analysis System for ZigBee in Smart Buildings*," University of Arizona, 2013 – 2015
- BSc: Birkan Kolcu, "*LIDAR Security and Resiliency for Smart Cars*," Ozyegin University, 2017 – 2018

### **New Courses Developed**

- CSCE 3560 – Computer Systems Security (University of North Texas): Theoretical and practical aspects of computer systems security; including operating system security, hardware security modules, hypervisors/virtualization security, storage security, application isolation, and cloud and IoT security.
- ECE 524 – Fundamentals of Cloud Security (University of Arizona): Cloud computing basics, threat modeling, physical infrastructure, virtualization, service, and user layer management and security.

### **TEACHING INTERESTS**

---

• Principles of Systems Programming • Computer Systems Security • Introduction to Computer Security • Fundamentals of Cloud Security • Cybersecurity - Concept, Theory, Practice • Distributed Computing • Reconfigurable Computing • Algorithms, Graphs, and Networks • Computer Architecture & Performance • Analysis of Algorithms • Microprocessors • Digital System Design

### **AWARDS**

---

- “OTZET: Operational Technology Zero Trust Engine for Trustworthiness” (team: Amal Alshehri, Burak Tufekci, Cihan Tunc) was awarded as the winning team of the “Sustainability through Cybersecurity” track of Siemens’ Tech for Sustainability 2024 Competition.

- *Best poster award* in CAC 2014 – F. Fargo, C. Tunc, Y. Al-Nashif, A. Akoglu, and S. Hariri, “*Autonomic Management of Cloud Resources and Services Framework*,” IEEE International Conference on Cloud and Autonomic Computing (CAC 2014), London, UK., Sep. 2014
- *Graduate Research Assistantship* in the Department of Electrical and Computer Engineering of the University of Arizona (Fall 2011 – Fall 2014)
- *Graduate Research/Teaching Assistantship* in the Department of Electrical and Computer Engineering at Northeastern University (Fall 2008 – Spring 2010)
- *Outstanding paper award* (F. Ugurdag, O. Keskin, C. Tunc, F. Temizkan, G. Fici, and S. Dedeoglu, “*RoCoCo: Row and Column Compression for High-Performance Multiplication on FPGAs*,” East-West Design & Test Symposium, Sevastopol, Ukraine, Sep. 2011)

## **MEMBERSHIP**

---

- IEEE Member (2006 – Present)
- Turkish Student Association at the University of Arizona (Academic Advisor, Spring 2017 – Fall 2018)
- Turkish Student Association at the University of Arizona (President, Spring 2012 – Fall 2014)
- IEEE Student Branch at Bahcesehir University (President, Fall 2007 – Spring 2008)
- IEEE Student Branch at Bahcesehir University (Member, Fall 2006 – Fall 2007)

## **REFERENCES**

---

*References are available upon request.*