Abdulrahman Takiddin, PhD

PERSONAL INFORMATION

Assistant Professor of Electrical and Computer Engineering
Florida State University
Email: a.takiddin@fsu.edu
Address: 2000 Levy Ave, Tallahassee, FL 32310, USA
Website: https://web1.eng.famu.fsu.edu/~takiddin/

EDUCATION

2020 – 2023 **Ph.D. in Electrical Engineering**
Texas A&M University – College Station, TX, USA
Department of Electrical and Computer Engineering
Dissertation: Machine Learning for Cyberattack Detection in Smart Power Grids
Advisor: Dr. Erchin Serpedin, IEEE Fellow – Professor and Program Chair
Co-Advisor: Dr. Katherine Davis, IEEE Senior Member – Assistant Professor

2018 – 2020 **M.Sc. in Data Analytics**
Hamad Bin Khalifa University – Doha, Qatar
College of Science and Engineering
Advisor: Dr. Jens Schneider, IEEE Member – Associate Professor
Co-Advisor: Dr. Yin (David) Yang, IEEE Member – Associate Professor

2011 – 2014 **B.Sc. in Information Systems**
Carnegie Mellon University – Pittsburgh, PA, USA
Dietrich School of Information Systems
Minor in Business Administration
Graduated with University Honors & College Honors

RESEARCH AREAS

Cyber-Physical Systems, Machine Learning, Cybersecurity, Smart Grid – Smart Transportation Systems, Bioinformatics
34 peer-reviewed publications with $>$ 750 citations
2 book chapters, 18 journal papers, and 14 conference papers
https://scholar.google.com/citations?user=4zR2Up4AAAAJ&hl=en&oi=en

PROFESSIONAL EXPERIENCE

Aug 2023 – Present **Assistant Professor**
Florida State University – Tallahassee, Florida, USA
FAMU-FSU College of Engineering, Electrical & Computer Engineering
Teaching and supervising students at the joint FAMU-FSU College of Engineering

Teaching
Spring 2025: (Undergraduate Teaching)
EEL 3705: Digital Logic Design
EEL 3505L: Digital Logic Design Lab

Fall 2024: (Undergraduate/Graduate Teaching)
EEL 4930/5930-1: Cyber-Physical Systems and Security
(newly introduced course with 10 new lab sessions)

Spring 2024: (Undergraduate/Graduate Teaching)
EEL 4930/5930-5: Applied Machine Learning for Engineers
(newly introduced course with 15 new lab sessions)

Student Supervision

- Supervising PhD students in Electrical Engineering
- Supervising Master students in Electrical Engineering
- Supervising Undergraduate students in Electrical and Computer Engineering

Aug 2023 – Present

Assistant Professor
Florida State University – Tallahassee, Florida, USA
Center for Advanced Power Systems

- Director of the Cyber-Physical Machine Learning (CPML) lab
- Working on machine learning-based solutions for detection, localization, and mitigation of cyberattacks on smart power grids
- Working on machine learning-based solutions for detection of attacks on water distribution systems
- Working on machine learning-based solutions for detection of cyberattacks and improving processes in intelligent transportation systems
- Working on machine learning-based solutions for improving processes in unmanned aerial vehicles (UAVs)

Aug 2023 – Present

Assistant Professor – Courtesy Appointment
Florida A&M University – Tallahassee, Florida, USA

Aug 2020 – Aug 2023

Graduate Research Assistant
Texas A&M University – College Station, Texas, USA
Department of Electrical and Computer Engineering

- Worked on multiple research projects on developing efficient machine learning-based detection of cyberattacks in smart grids under the supervision of Dr. Erchin Serpedin, IEEE Fellow – Professor and Program Chair and Dr. Katherine Davis, IEEE Senior Member - Associate Professor
- Supervised undergraduate students with senior design projects related to artificial intelligence and machine learning

Jan – Aug 2021

Graduate Teaching Assistant
Texas A&M University – College Station, Texas, USA
Department of Electrical and Computer Engineering
Spring 2021:
ECEN 350: Computer Design and Architecture

- Conducted the course lab sessions and held review sessions and office hours to support student learning
- Managed quizzes, exams, and grading

Jul 2017 – Aug 2020

Senior Research Associate
Texas A&M University at Qatar – Doha, Qatar
High-Performance Computing Facility

- Administered the high-performance computing (HPC) facility at Texas A&M University at Qatar.
- Worked on research projects to collect, analyze, and enhance the HPC system usage.
- Supported researchers with tasks that require high-performance computations.

Jul 2015 – Jul 2017 **Software Engineer**
Ministry of Culture and Youth – Doha, Qatar
- Developed management systems to automate different organizational processes
- Held programming as well as web and mobile app development workshops for high school and university students

Aug – Dec 2014 **Teaching Assistant**
Carnegie Mellon University – Pittsburgh, PA, USA
Fall 2014
67-250: Information Systems Miliuex
- Conducted the course lab sessions and held review sessions and office hours to support student learning
  Managed quizzes, exams, and grading

May 2014 – Jul 2015 **Web and Database Developer**
Carnegie Mellon University – Pittsburgh, PA, USA
- Developed websites with accessibility and usability accreditation for several sectors
- Created a student database and built a user-friendly interface for information updates

AWARDS & HONORS

Dec 2024 Best Presentation Award – 6th International Conference on Smart Power & Internet Energy Systems (SPIES)

Jan 2024 Best Paper Award – 4th International Conference on Smart Grid and Renewable Energy (SGRE)

Aug 2021 – Aug 2023 PhD Fellowship Award – Texas A&M University

Aug 2018 – May 2020 Academic Scholarship – Hamad Bin Khalifa University
Received a reward for outstanding academic performance.

Dec 2014 University Honor – Carnegie Mellon University
Graduated with outstanding academic performance.

Dec 2014 College Honor – Carnegie Mellon University
Graduated with a research award from the Dietrich School of Information Systems.

Dec 2013 Academic Scholarship – Carnegie Mellon University
Received a reward for outstanding academic performance.

PROJECT FUNDS

Awarded

May – Aug 2024 Lead PI – First Year Assistant Professor (FYAP) – Florida State University
Machine Learning-Based Intrusion Detection in Smart Power Grids with Cyber-Physical Feature Fusion ($20,000)

Pending

May 2025 Co-PI – Electric Ship Research and Development Consortium (ESRDC) – Office of Naval Research (ONR)

Feb 2025 Co-PI – Global Resilience through Integrated Defense for Securing the U.S. Electric Grid (GRIDSEC) – Department of Energy (DOE)

Feb 2025 Lead PI – Cyber Simulator for Power Grid Resilience and Sustainability through AI-Driven Human-Centered Computing (CYPHERS-AI) – Department of Energy (DOE)

PUBLICATIONS

Book Chapters

[1] Takiddin, M. Elhissi, S. Abuhaliqa, and Y. Yang, "Reinforcement Learning Applications in Health Informatics", in *Multiple Perspectives on Artificial Intelligence in Healthcare*, Cham: Springer International Publishing, Aug. 2021, pp. 145–154, ISBN 978-3-030-67303-1

[2] A. Takiddin, M. Ismail, R. Atat, K. Davis, and E. Serpedin, Graph "Autoencoder-Based Detection of Unseen False Data Injection Attacks in Smart Grids," in *Intelligent Systems and Applications* Cham: Springer International Publishing, Jan. 2024, p. 234—244, doi: 10.1007/978-3-031-47721-8 16.

Journal Publications

[1] M. Elnour, R. Atat, A. Takiddin, M. Ismail, and E. Serpedin, "Eigenvector centrality-enhanced graph network for attack detection in power distribution systems," *Electric Power Systems Research*, vol. 241, p. 111339, April 2025, 10.1016/j.epsr.2024.111339.

[2] S. R. Fahim, R. Atat, C. Kececi, A. Takiddin, M. Ismail, K. R. Davis, and E. Serpedin, "Dynamic spatio-temporal planning strategy of EV charging stations and DGs using GCNN-based predicted power demand," IEEE Transactions on Intelligent Transportation Systems, vol. 26, no. 4, pp. 4528–4542, April 2025, 10.1109/TITS.2025.3541190.

[3] R. Atat, A. Takiddin, M. Ismail, and E. Serpedin, "Graphon neural networks-based detection of false data injection attacks in dynamic spatio-temporal power systems," *IEEE Open Access Journal of Power and Energy*, vol. 12, pp. 24–35, Jan. 2025, 10.1109/OAJPE.2025.3530352.

[4] S. R. Fahim, R. Atat, C. Kececi, A. Takiddin, M. Ismail, K. R. Davis, and E. Serpedin, "Graph neural network-based approach for detecting false data injection attacks on voltage stability," *IEEE Open Access Journal of Power and Energy*, vol. 12, pp. 12–23, Jan. 2025, 10.1109/OAJPE.2024.3524268.

[5] S. R. Fahim, R. Atat, C. Kececi, A. Takiddin, M. Ismail, K. R. Davis, and E. Serpedin, "Graph autoencoder-based power attacks detection for resilient electrified transportation systems," IEEE Transactions on Transportation Electrification, vol. 10, no. 4, pp. 9539–9553, Dec. 2024, doi: 10.1109/TTE.2024.3355094.

[6] A. Takiddin, M. Ismail, R. Atat, and E. Serpedin, "Spatio-temporal graph-based generation and detection of adversarial false data injection evasion attacks in smart grids," IEEE Transactions on Artificial Intelligence, vol. 5, no. 12, pp. 6601–6616, Dec. 2024, doi: 10.1109/TAI.2024.3464511.

[7] W. Liao, A. Takiddin, M. Tariq, S. Chen, L. Ge, and Z. Yang, "Sample adaptive transfer for electricity theft detection with distribution shifts," IEEE Transactions on Power Systems, vol. 39, no. 6, pp. 7012–7024, Nov. 2024, doi: 10.1109/TPWRS.2024.3375939.

[8] W. Liao, R. Zhu, A. Takiddin, M. Tariq, G. Ruan, X. Cui, and Z. Yang, "Transfer learning-driven electricity theft detection in small sample cases," *IEEE Transactions on Instrumentation and Measurement*, vol. 73, pp. 1–13, Oct. 2024, doi: 10.1109/TIM.2024.3470061.

[9] A. Takiddin, M. Ismail, R. Atat, K. R. Davis, and E. Serpedin, "Robust graph autoencoder-based detection of false data injection attacks against data poisoning in smart grids," IEEE Transactions on Artificial Intelligence, vol. 5, no. 3, pp. 1287–1301, Mar. 2024, doi: 10.1109/TAI.2023.3286831.

[10] A. Takiddin, R. Atat, M. Ismail, O. Boyaci, K. Davis, and E. Serpedin, "Generalized graph neural network-based detection of false data injection attacks in smart grids," *IEEE Transactions on Emerging Topics in Computational Intelligence*, vol. 7, no. 3, pp. 618-630, June 2023, doi: 10.1109/TETCI.2022.3232821.

[11] A. Takiddin, M. Ismail, and E. Serpedin, "Robust data-driven detection of electricity theft adversarial evasion attacks in smart grids," *IEEE Transactions on Smart Grid*, vol. 14, no. 1, pp. 663–676, Jan. 2023, doi: 10.1109/TSG.2022.3193989.

[12] A. Takiddin, S. Rath, M. Ismail, and S. Sahoo, "Data-driven detection of stealth cyber-attacks in DC microgrids," *IEEE Systems Journal* vol. 16, no. 4, pp. 6097-6106, Dec. 2022, doi: 10.1109/JSYST.2022.3183140

[13] A. Takiddin, M. Ismail, U. Zafar, and E. Serpedin, "Deep autoencoder- based anomaly detection of electricity theft cyberattacks in smart grids," *IEEE Systems Journal*, vol. 16, no. 3, pp. 4106–4117, Sept. 2022, doi: 10.1109/JSYST.2021.3136683

[14] A. Takiddin, M. Shaqfeh, O. Boyaci, E. Serpedin, and M. A. Stotland, "Toward a universal measure of facial difference using two novel machine learning models," *Plastic and Reconstructive Surgery Global Open*, vol. 10, no. 1, Jan. 2022, doi: 10.1097/GOX.0000000000004034

[15] A. Takiddin, J. Schneider, Y. Yang, A. Abd-Alrazaq, and M. Househ, "Artificial intelligence for skin cancer detection: Scoping review," *Journal of medical Internet research*, vol. 23, no. 11, p. e22934, Nov. 2021, doi: 10.2196/22934

[16] A. Takiddin, M. Ismail, M. Nabil, M. Mahmoud, and E. Serpedin, "Detecting electricity theft cyber-attacks in AMI networks using deep vector embeddings," *IEEE Systems Journal*, vol. 15, no. 3, pp. 4189–4198, Sept. 2021, doi: 10.1109/JSYST.2020.3030238

[17] A. Takiddin, M. Ismail, U. Zafar, and E. Serpedin, "Robust electricity theft detection against data poisoning attacks in smart grids," *IEEE Transactions on Smart Grid*, vol. 12, no. 3, pp. 2675–2684, May 2021, doi: 10.1109/TSG.2020.3047864

[18] J. Almulla, A. Takiddin, and M. Househ, "The use of technology in tracking soccer players' health performance: A scoping review," *BMC Medical Informatics and Decision Making*, vol. 20, no. 184, pp. 1–10, Aug. 2020, doi: 10.1186/s12911-020-01156-4

Conference Publications

[1] F. Joad, R. Atat, H. Mbayed, and A. Takiddin, "Recurrent graph neural network-based identification of replay attacks in power networks," in *4th International Conference on Electrical, Computer, Communications and Mechatronics Engineering (ICECCME)*. Male, Maldives, 04 – 06 Nov. 2024, pp. 1 – 6, doi: 10.1109/ICECCME62383.2024.10796488.

[2] S. R. Fahim, R. Atat, C. Kececi, A. Takiddin, M. Ismail, K. R. Davis, and E. Serpedin, "Cyberattack aware load frequency control in power systems," in *58th Asilomar Conference on Signals, Systems, and Computers*. Pacific Grove, CA, USA, 27 – 30 Oct. 2024, pp. 1058 – 1062, doi: 10.1109/IEEECONF60004.2024.10942756.

[3] A. Takiddin, R. Atat, H. Mbayed, M. Ismail, and E. Serpedin, "Resilience of data-driven cyberattack detection systems in smart power grids," *in 32nd European Signal Processing Conference (EUSIPCO)*. Lyon, France, 26–30 Aug. 2024, pp. 1992 – 1996, doi: 10.23919/EUSIPCO63174.2024.10715330

[4] S. R. Fahim, R. Atat, C. Kececi, A. Takiddin, M. Ismail, K. R. Davis, and E. Serpedin, "Generalized fdia detection in power dependent electrified transportation systems," in *32nd European Signal Processing Conference (EUSIPCO)*. Lyon, France, 26 – 30 Aug. 2024, pp. 1851 – 1855, doi: 10.23919/EUSIPCO63174.2024.10715443.

[5] S. R. Fahim, R. Atat, C. Kececi, A. Takiddin, M. Ismail, K. R. Davis, and E. Serpedin, "Forecasting ev charging demand: A graph convolutional neural network-based approach," in *4th International Conference on Smart Grid and Renewable Energy (SGRE)*. Doha, Qatar, 8–10 Jan. 2024, pp. 1–6, doi: 10.1109/SGRE59715.2024.10428726.

[6] J. Sweeten, A. Takiddin, M. Ismail, S. S. Refaat, and R. Atat, "Cyber-physical GNN-based intrusion detection in smart power grids," *in IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm)*. Glasgow, United Kingdom, 31 Oct.–3 Nov. 2023, pp. 1–6, doi: 10.1109/SmartGridComm57358.2023.10333949.

[7] S. Poudel, J. E. Baugh, A. Takiddin, M. Ismail, and S. S. Refaat, "Injection attacks and detection strategy in front-end vehicle-to-grid communication," in *IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm)*. Glasgow, United Kingdom, 31 Oct.–3 Nov. 2023, pp. 1–6, doi: 10.1109/SmartGridComm57358.2023.10333927.

[8] A. Takiddin, R. Atat, M. Ismail, K. Davis, and E. Serpedin, "Graph autoencoder-based detection of unseen false data injection attacks in smart grids," in *Intelligent Systems Conference (IntelliSys)*. Amsterdam, Netherlands, 7–8 Sept. 2023

[9] A. Takiddin, R. Atat, M. Ismail, K. Davis, and E. Serpedin, "A graph neural network multi-task learning-based approach for detection and localization of cyberattacks in smart grids," in *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2023)*. Rhodes Island, Greece, 4–10 Jun. 2023, pp. 1-5, doi: 10.1109/ICASSP49357.2023.10096822.

[10] A. Takiddin, M. Ismail, and E. Serpedin, "Detection of electricity theft false data injection attacks in smart grids," in *30th European Signal Processing Conference (EUSIPCO)*. Belgrade, Serbia, 29 Aug.–2 Sept. 2022, pp. 1541–1545.

[11] A. Takiddin, M. Shaqfeh, O. Boyaci, E. Serpedin, and M. Stotland, "Gauging facial abnormality using haar-cascade object detector," in *44th Annual International Conference of the IEEE Engineering in Medicine Biology Society (EMBC)*. Glasgow, Scotland, United Kingdom, 11–15 Jul. 2022, pp. 1448–1451, doi: 10.1109/EMBC48229.2022.9871337

[12] A. Takiddin, M. Ismail, U. Zafar, and E. Serpedin, "Deep autoencoder-based detection of electricity stealth cyberattacks in AMI networks," in *International Symposium on Signals, Circuits and Systems (ISSCS)*. Iasi, Romania, 15–16 Jul. 2021, pp. 1–6, doi: 10.1109/ISSCS52333.2021.9497376

[13] A.Takiddin, M.Ismail, and E. Serpedin, "Robust detection of electricity theft against evasion attacks in smart grids," in *IEEE International Conference on Communications (ICC)*. Montreal, QC, Canada, 14–23 Jun. 2021, pp. 1–6, doi: 10.1109/ICC42927. 2021.9500822

[14] A. Takiddin, M. Ismail, U. Zafar, and E. Serpedin, "Variational auto-encoder-based detection of electricity stealth cyber-attacks in AMI networks," in *28th European Signal Processing Conference (EUSIPCO)*. Amsterdam, Netherlands, 18–21 Jan. 2021, pp. 1590–1594, doi: 10.23919/Eusipco47968.2020.9287764

Master Thesis

[1] A. Takiddin, "An Artificial Intelligence Tool to Detect and Classify Skin Cancer," *Hamad Bin Khalifa University ProQuest*, Apr. 2020.

PhD Dissertation

[1] A. Takiddin, "Machine Learning-Based Approaches for Detection of Cyberattacks in Smart Power Grids", *Texas A&M University*, Aug. 2023.

STUDENT SUPERVISION

Aug 2023 – Present — Florida State University – Tallahassee, FL, USA

PhD Students

- Salma Aboelmagd, *Cybersecurity of Unmanned Aerial Vehicles*
  Start Date: Fall 2024, Expected Graduation Date: Spring 2028
- Md Rakibul Ahasan, *Security of intelligent transportation systems*
  Start Date: Fall 2024, Expected Graduation Date: Spring 2028
- Faaiz Joad, *Security of water distribution systems*
  Start Date: Summer 2024, Expected Graduation Date: Fall 2027

MS Students

- Rajdeep Dhurat, *Machine Learning to Detect Attacks in Power Grids*
  Start Date: Fall 2023, Graduation Date: Spring 2025

Undergraduate Research Opportunity Program (UROP) Students

- Alyssa Traina, *Machine Learning-Based Security of Smart Grids*
  Start Date: Fall 2024
- Layhan Mishra, *Data-Driven Security of Cyber-Physical Systems*
  Start Date: Fall 2024

Research Interns

- Alex Burnside, *Deep Learning Security of Smart Grid*
  Start Date: Summer 2025
- Ryan Driscoll, *Machine Learning Security of UAVs*
  Start Date: Summer 2025
- Aaryan Patel, *Machine Learning Security of Smart Transportation Systems*
  Start Date: Summer 2025
- Rafik Talib, *Machine Learning Security of Electric Vehicles*
  Start Date: Spring 2025

- Mohamad Nour Alhendi, *Machine Learning Attack Detection in Water Systems*
  Start Date: Fall 2024

Research Assistants

- Coleman Thompson, *Machine Learning Security of Water Distribution Systems*
  Start Date: Summer 2024

Engineering Senior Design Projects

Fall 2024 – Spring 2025

- Milyema Krivit, Andrew Williams, Nolen Levin, Justin Pollack, and Carson Burke
- *Enhancing Self-Driving Vehicles Using Machine Learning*

Fall 2023 – Spring 2024

- Naela Luna, Megan Brais, Sydney Dudek, Aireyona Mercer, Joshua Brown, and Jadarrian Brown
- *Machine Learning-Based Real-Time Translator*

Aug 2023 – Present **Texas A&M University** – College Station, Texas, USA

Engineering Senior Design Projects

Fall 2020 – Spring 2021

- Omar Atout, Mohammed Al-Horr, and AhmedAl-Ali
- *Machine Learning to Generate Normalized Versions of Abnormal Human Faces*
- Best Senior Design Project Award

PROFESSIONAL ACTIVITIES & SERVICE

Conference Organization

May 2024 Session Chair – 10th International Conference on Fog and Mobile Edge Computing (FMEC) – Tampa, FL, USA

Jul 2021 Session Chair – International Symposium on Signals, Circuits and Systems (ISSCS) – Iasi, Romania

Invited Lectures

Dec 2024 Machine Learning Seminar – Texas A&M University – College Station, Texas, USA
Machine Learning-Based Security Enhancements in Cyber-Physical Systems

Dec 2024 Cybersecurity Seminar – Hamad Bin Khalifa University – Doha, Qatar
Cybersecurity for Cyber-Physical Systems Through Advanced Machine Learning

Sept 2024 Graduate Seminar – FAMU-FSU College of Engineering – Tallahassee, FL, USA
Machine Learning-Based Security for Power Systems

Feb 2024 Graduate Seminar – FAMU-FSU College of Engineering – Tallahassee, FL, USA
Machine Learning-Based Detection of Attacks in Cyber-Physical Systems

Workshops

Aug 2018 Mentor – Engineering Enrichment Program, Texas A&M University
Conducted Python workshops to guide students with their coursework and projects.

Feb 2018	Invited Speaker – Carnegie Mellon University Conducted a workshop to guide students with their Senior Research Thesis

Feb 2020 – Present	**Journal Papers Reviewer** https://www.webofscience.com/wos/author/record/AEJ-0321-2022 IET Communications IEEE Internet of Things Journal IEEE Systems Journal IEEE Journal of Emerging and Selected Topics in Industrial Electronics IEEE Transactions on Artificial Intelligence IEEE Transactions on Dependable and Secure Computing IEEE Transactions on Emerging Topics in Computational Intelligence IEEE Transactions on Power Systems IEEE Transactions on Services Computing IEEE Transactions on Smart Grid IEEE Transactions on Transportation Electrification IEEE Transactions on Vehicular Technology Springer Nature

Professional Memberships

Jan 2022 – Present	IEEE Member
Jan 2022 – Present	ACM Member

Service at Florida State University

Departmental Committees

Oct 2024 – Present	Admissions Committee Member – Cyber Security Certificate
April 2024 – Present	Committee Member – Cyber-Physical Security Seminar Series
Aug 2023 – Present	Committee Member – Undergraduate Curriculum Committee
Aug 2023 – Present	Committee Member – Computer Engineering Curriculum

Graduate Committees

Sept 2024 – Present	PhD Committee Member – PhD Candidate: Keertana Alugoti
Sept 2024 – Present	PhD Committee Member – PhD Candidate: Mohammed Sumayli
Mar – May 2024	MS Committee Member – MS Student: Brad Shonka
Mar – May 2024	MS Comprehensive Exam Committee – MS Student: Cyrus Mathews Mittakadapa
Mar – May 2024	MS Comprehensive Exam Committee – MS Student: Miguel Ramirez
Mar – May 2024	MS Comprehensive Exam Committee – MS Student: Safouh Alhendi

Undergraduate Research

Sept 2024 – Present	Research Mentor – Undergraduate Research Opportunity Program (UROP)
Aug 2023 – May 2024	Research Advisor – Undergraduate Engineering Senior Design
Aug 2024 – May 2025	Research Advisor – Undergraduate Engineering Senior Design