

Abhijit Kumar Nag, Ph.D.

Department of Computer Information Systems
Texas A&M University-Central Texas
1001 Leadership Place, FH 323P, Killeen, TX 76549.
Webpage: <https://www.linkedin.com/in/aknag>

Education

Ph.D. in Computer Science

December 2016.

The University of Memphis, Memphis, TN

Dissertation: An Adaptive Strategy towards the Selection of Authentication Factors in Multi-factor Authentication (MFA) system.

Master of Science in Computer Engineering

August 2012

The University of Memphis, Memphis, TN

Thesis: Semantic-sensitive Query Expansion Method for Short-text Analytics and Mining.

Appointments

01/2017- present	Assistant Professor, Department of Computer Information Systems, Texas A&M University-Central Texas, Killeen, TX 76549.
09/2012-12/2016	Doctoral Research Assistant, Department of Computer Science, The University of Memphis, Memphis, TN 38152. Project funding agency: IARPA, FEMA, and NSF.
06/2011-04/2012	Software Developer-Testing and Remediation at FedEx Services World Tech Center, Collierville, TN.
09/2009-05/2011	Graduate Research Assistant, Department of Computer Engineering, The University of Memphis, Memphis, TN 38152. Project funding agency: NSF.

Teaching Interest

Cyber Security, Information Security and Risk Management, Networking Systems, Digital Forensics, Data Mining, Machine Learning and Big Data Analysis.

Research Interest

Computer and Network Security, Authentication Systems, Cybersecurity, Cyber-Physical Systems, Anomaly Detection, Bio-inspired Computing, Internet of Things.

Invention Disclosure (Patent Application)

United States Utility Patent Application
Serial No. **14/968676**
Patent No: **9912657**
Entitled: Adaptive Multi-factor Authentication System
Issued date: March 06, 2018.

Teaching and Mentoring Experience

Assistant Professor, Texas A&M-Central Texas

- Courses taught
 - CIS 3347: Data Communication and Infrastructure Summer 2017, Spring 2018, Spring 2019
 - CIS 3315: Website Development and Design Summer 2018
 - CIS/COSC 4341: IT Security and Risk Management Spring 2017, Summer 2018
 - CIS 4345: Network and Systems Security Spring and Fall 2017, Spring and Fall 2018
 - CIS/COSC 4378: Comprehensive Networking Spring 2017-2019, Fall 2017 and 2018.
 - CIS 4346: Applied Security Fall 2018
 - COSC 3343: Computer Architecture Fall 2017 and Fall 2018
 - CIS 5302: Procedural Language Programming and Design Summer 2017 and Spring 2019

Mentor of Capstone Project, The University of Memphis

- Mentored a team of four undergraduate students to complete their final year software project (COMP 4882).
- Provided support in areas of design, analysis, and implementation of the software project, which was developed on the Android platform.
- Served as a customer for the group to provide valuable feedback throughout the development phases (alpha and beta) of the project.

Lecturer, Department of Computer Science and Engineering Premier University, Chittagong, Bangladesh-4203.

- Taught the following courses: Microprocessor and Microcontrollers, Multimedia and Image Processing, Foundations of Computer Science, AutoCAD (Mechanical Engineering Drawing)
- Prepared, administered and conducted midterm and final exams.
- Graded exams, term papers, and laboratory reports.
- Mentored four groups of undergraduate students in their final year software projects.
- Worked as a department coordinator to prepare the course curriculum for undergraduate courses.

Industry Experience

FedEx Services- World Tech Center (WTC), Collierville, TN.

June 2011 – April 2012

Employer: Cook Systems International, Germantown, TN.

Role: Software Developer-Testing and Remediation as a consultant.

Project: Shopfloor Management in Air Ops Systems Development

- Developed a customer based solution to provide a scalable system which increased the search performance of millions of customer records in real time.
- Integrated different modules and worked on a collaborative project with three teams to build a tailored, robust and scalable product for FedEx Services.

Research Experience

Project Title: Developing an Adaptive Multi-Factor Authentication (A-MFA) Methodology

Duration: September 2015- December 2019

Responsibilities:

- Worked as a key person to implement the prototype for adaptive selection of MFA incorporating the biometric and non-biometric authentication modalities.
- Supervised a team of one master's student and two undergraduate students regarding their assigned tasks to meet project deadlines.
- Prepared documentation for all the developed codes and the hardware sensors used to develop A-MFA.

- Worked with The University of Memphis Technology Transfer and Innovation team to design marketing flyer and business plan to commercialize implemented prototype.
- Web Link: http://www.memphis.edu/cs/news_and_events/news/2016_cfia_student_highlights.php

Project Title: Act Online

Duration: June 2014 – August 2016

Responsibilities:

- Worked as a Subject Matter Expert (SME) to update the contents of courses titled, “Cyber Incident Analysis and Response (CIAR-AWR-169)” and “Information Risk Management (IRM-AWR-177)”.
- Added new contents to meet the requirements of current security practices and guidelines.
- Served as a beta tester to verify the contents and check all the functionalities of developed online courses.
- Prepared course outline for an online course on Cyber Identity and Authentication.

Project Title: Puzzle-Based Learning

Duration: September 2014 – August 2016

Responsibilities:

- Worked as a team leader and a key person to develop security puzzles based on different scenarios of cyber security.
- Designed the mathematical logic that drives the different scenarios of the puzzles and gave the participants various aspects of possible solutions to a particular problem.
- Managed and supervised three undergraduate students to develop security puzzle-based games using Unreal engine and Articulate Storyline.
- Presented and demonstrated implemented puzzle-based games in 2016 ATE Principal Investigators Conference, Washington, DC (October 26-28, 2016).

Project Title: Negative Authentication System (NAS)

Duration: August 2012- December 2013

Responsibilities:

- Collaborated as a leading institution with MIT Geo-Spatial Lab to implement NAS.
- Designed and implemented the algorithms for Binary, Real and Grid based representation of Negative Authentication System.
- Presented the final project demo to the funding agency at Baltimore, MD in November 2013.
- Prepared monthly progress reports being submitted to the funding agency.

Research Publications

Total citations: **100+**, h-index: **7**. (As of January 2019, in Google Scholar)

Patent Application

- ✓ Dipankar Dasgupta, Abhijit Kumar Nag, and Arunava Roy. "Adaptive multi-factor authentication system." U.S. Patent Application 14/968,676. **Issued on March 06, 2018.**

Textbook

- ✓ Dipankar Dasgupta, Arunava Roy and Abhijit Kumar Nag, “Advances in User Authentication”, Springer-Verlag, September 2017.

Journal

- ✓ Dipankar Dasgupta, Abhijit Kumar Nag, Denise Ferebee, Sanjib Kumar Saha, Kul Prasad Subedi, Arunava Roy, Alvaro Madero, Abel Sanchez, John R. Williams. Design and implementation of Negative

Authentication System. International Journal of Information Security, November 2017. [**corresponding author**]

- ✓ Dipankar Dasgupta, Arunava Roy, and Abhijit Kumar Nag. "Toward the design of adaptive selection strategies for multi-factor authentication." Computers & Security in Elsevier, September 2016. [**first student author**]

Peer-reviewed Proceedings

- ✓ Abhijit Kumar Nag and Dipankar Dasgupta. A Survey on Computational Intelligence Techniques in User Identity Management, 23rd World Multiconference on Systemics, Cybernetics and Informatics, July 6-9, 2019.
- ✓ Abhijit Kumar Nag, Arunava Roy, and Dipankar Dasgupta. An Adaptive Approach towards the Selection of Multi-factor Authentication. In Computational Intelligence, 2015 IEEE Symposium Series on, vol., no., pp.463-472, 7-10 Dec. 2015.
- ✓ Sanjib Kumar Saha, Abhijit Kumar Nag, and Dipankar Dasgupta. "Human-Cognition-Based CAPTCHAs." IT Professional 17, no. 5 (2015): 42-48.
- ✓ Dipankar Dasgupta, Denise Ferebee, Sanjib Saha, Abhijit Kumar Nag, Alvaro Madero, Abel Sanchez, John William, Kul Prasad Subedi. G-NAS: A Grid-Based Approach for Negative Authentication. In the proceedings of Symposium on Computational Intelligence in Cyber Security (CICS) at IEEE Symposium Series on Computational Intelligence (SSCI). Orlando, Florida: December 9-12, 2014.
- ✓ Abhijit Kumar Nag, Dipankar Dasgupta, Kalyanmoy Deb. An Adaptive Approach for Active Multi-Factor Authentication. In the proceedings of 9th Annual Symposium on Information Assurance (ASIA). Albany, NY: June 3-4, 2014.
- ✓ Abhijit Kumar Nag, Dipankar Dasgupta. An Adaptive Approach for Continuous Multi-factor Authentication in an Identity Eco-System. In Cyber and Information Security Research (CISR) Conference, Oak Ridge National Laboratory. Oak Ridge, TN, USA: April 8-10, 2014.

External Grant Application

- Submitted an external grant as a Lead Instructor (Co-PI) for GenCyber 2018 Grant (Funding agency: NSF and NSA).

Awards and Honors

- Accepted as a **special session chair** on IEEE CICS conference on IEEE-SSCI 2018.
- Accepted as a **Technical Program Committee** (TPC) member at IEEE CICS conference, 2017-2018.
- Accepted for **SEED Summer Workshop** at Syracuse University, NY. Also received NSF travel grant from the Workshop to attend in Summer 2018.
- **Best Paper Runner-up** Award for the conference paper, entitled "*An Adaptive Approach for Continuous Multi-factor Authentication in an Identity Eco-System*" in April 2014.
- **First** prize in Computer Science Research Day in the category of poster presentation in 2013, 2015, and 2016.
- **Second** prize in Annual University Research Forum 2016 in the category of Math and Computer Science.
- **First** prize in Annual University Research Forum in 2014 and 2015 in the category of Math and Computer Science.

Invited/Accepted Research Talk

- Presented a tutorial on a topic titled "*Computational Intelligence in User Identity Management*" at IEEE SSCI 2017 conference at Honolulu, Hawaii (November 28, 2017).

- Research Colloquium Talk on “*An Adaptive Multi-factor Authentication System- Design and Implementation*” at Computer Science department, Baylor University, Waco, TX (November 17, 2017).
- Presented an invited talk on Password Security and Authentication techniques at Killeen ISD Career Center, Killeen, TX (October 11, 2018).
- Presented Cybersecurity Puzzle Based Learning project on National Initiative for Cybersecurity Education (NICE) K-12 Subgroup Meeting on November 09, 2016.

Professional Service

1. Guest reviewer for peer-reviewed well-reputed journals
 - European Journal of Operational Research (**EJOR**) (2014-)
 - Evolutionary Computation Journal (**ECJ**) (2014-)
 - Elsevier Journal of Computers & Security (**COSE**) (2014-)
 - Information Sciences (**INS**) (2014-)
 - Soft Computing (**SOCO**) (2017-)
 - Wireless Communications and Mobile Computing (2018 -)
2. Guest reviewer of the peer-reviewed conferences
 - World Multi-Conference on Systemics, Cybernetics, and Informatics (**WMSCI**) (2015-)
 - IEEE Symposium Series on Computational Intelligence (**SSCI**) (2015-)
 - Hawaii International Conference on System Sciences (**HICSS**) (2016-)
 - IEEE INFOCOM (2017-)
 - IEEE International Conference on Computing, Networking, and Communications (**ICNC**) (2017-)
 - IEEE International Conference on Mobile Ad-Hoc and Sensor Systems (2017 -)
3. Member, Institute of Electrical and Electronics Engineers, Inc. (**IEEE**), 2014- present.
4. Professional Member, Association of Computing Machinery (**ACM**), 2017 – present.
5. Faculty Senate Member, Texas A&M University-Central Texas since Fall 2018.
6. At-Large Faculty Member of Enterprise Applications Steering committee (2018-2019), Texas A&M University-Central Texas.
7. Academic Program Review Follow-up Committee (2017), Texas A&M University-Central Texas.
8. Member of Website Development Advisory Committee, Texas A&M University-Central Texas since Spring 2017.
9. Participated in QM Connect Conference at Fort Worth, TX in September, 2017.
10. Completed QM Rubric Update Sixth Edition (RU) in January 2019.
11. Completed the online course training on Applying the Quality Matters Rubric (APPQMR) in August 2017.
12. Completed the online course training on Independent Improving Your Online Course (IYOC): (Statewide Systems) in March 2018.
13. Completed Citi Program course for Social & Behavioral Research - Basic/Refresher in January 17, 2019.
14. Completed Citi Program course for Social and Behavioral Responsible Conduct of Research in January 19, 2019.
15. Participated in “*We END Violence*” workshop at Texas A&M University-Central Texas in March 2017.

16. Participated in Technology Enhanced Learning Session by Steven Hill on September 12, 2017.
17. Participated in Accessibility Panel Discussion in October 2017.
18. Participated in *Advisor Training: Advising Students* on October 24, 2017.
19. Designed a curriculum for one hour workshop on *Password Strength Analysis* for K-12 students with Library grant.
20. Participated as a member of a steering committee of a national initiative on *Digital Polarization: A Project to Promote Online Civic Information Literacy* since March 2018.
21. Participated in “*Student Schedule Planner Demo*” from Register Office on March 20, 2018.
22. Represented Computer Information Department at Warrior Preview Day on February 10, 2018.
23. Participated in *Concur Full Demo Training* on February 15, 2018.
24. Participated in *Copyright Panel Meeting* by Lisa Bunkowski on January 30, 2018.
25. Advising BS-CS students in their course curriculum planning from Spring 2018.