

**Curriculum Vitae**  
**Abhijit Kumar Nag, Ph.D.**  
1001 Leadership Place, Killeen, FH 323P, Killeen, TX 76549

## Education

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| <b>Ph.D. in Computer Science</b><br>The University of Memphis, Memphis, TN   | December 2016. |
| <b>Master of Science in Computer Engineering</b><br>The University of Memphis, Memphis, TN   | August 2012    |
| <b>Bachelor of Science in Computer Science and Engineering</b><br>Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh. | June 2007      |

## Appointments

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| 01/2017- present | Assistant Professor, Department of Computer Information Systems,<br>Texas A&M University-Central Texas, Killeen, TX.                                     |
| 09/2012-12/2016  | Doctoral Research Assistant, Department of Computer Science,<br>The University of Memphis, Memphis, TN.<br>Project Funding Agency: IARPA, FEMA, and NSF. |
| 09/2009-05/2011  | Graduate Research Assistant, Department of Computer Engineering,<br>The University of Memphis, Memphis, TN.<br>Funding Agency: NSF.                      |
| 07/2007-08/2008  | Lecturer, Department of Computer Science and Engineering<br>Premier University, Chittagong-4203, Bangladesh.   |

## Teaching Interest

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Computer and Networking Systems and Security, Information Security and Risk Management, Networking Systems, Digital Forensics, Operating System, Data Mining, Machine Learning.

## Research Interest

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Computer and Network Security, Authentication Systems, Cyber Security, Cyber Physical System, Anomaly Detection, Bio-inspired Computing, Data Mining, Machine Learning.

## Ph.D. Research

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

- Focused on building an MFA system where the selection of authentication factors is made by adaptively sensing the operating devices, connecting media, and surrounding conditions (light, noise, motion, location, etc.) of the users.
- Designed a mathematical framework to compute trustworthy values to rank different authentication modalities and their corresponding features.

## **Invention Disclosure (Patent Application)**

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United States Utility Patent Application  
Serial No. **14/968676**  
Entitled: Adaptive Multi-factor Authentication System  
Filed: December 14, 2015.

United States Provisional Patent Application  
Serial No. **62/262,626**  
Entitled: Adaptive Multi-factor Authentication System  
Filed: December 04, 2015.

## **Teaching and Mentoring Experience**

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### **Assistant Professor, Texas A&M-Central Texas, Killeen, TX 76549.**

#### **Course Instructor**

- Conduct lectures in the following courses as a primary instructor:
  - o Spring 2017
    - CISK 441-110/ C SK 441-110 IT Security and Risk Management
    - CISK 445-110 Network and System Security
    - CISK 478-110 Comprehensive Networking
  - o Summer 2017
    - CISK 347-115 Data Communications
    - CISK 442-115 Computer Security: Principles and Practices
- Completed training for Canvas Learning Platform for Level 1 and Level 3 (Online Course Teaching) in Spring 2017.
- Mentor students in semester-long projects and lab assignments to provide hands-on experience to apply learned theories.

#### **Doctoral Study**

##### **Guest Lecturer**

- Conducted lectures on Network/Internet Security (COMP 7327/8327), Computer Security (COMP 4410/6410), and Computer Forensics (COMP 7125) courses as a guest lecturer in 2014-2016.
- Participated in designing the syllabus of different undergraduate level courses.
- Adopted **Respondus 4.0** and **StudyMate Author** software to generate in-class quizzes and exam questions for various classes.
- Used **Turnitin** platform to ensure the academic integrity of the submitted assignments.
- Used **Qualtrics** to create surveys to get feedback from undergraduate and graduate students and incorporate feedback in designing the class lectures.
- Prepared exam questions, conducted the tests, and graded them.

##### **Mentor of Undergrad Capstone and Master's Project**

- 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.
- Mentored one graduate student in his Master's project (COMP 7980) to develop a novel fingerprint image classifier using deep learning approach.

##### **Undergraduate Course**

- Conducted Discrete Structure (COMP 2700) as a teaching assistant for 68 students. It is one of the core and ABET accredited courses in the undergraduate program of Computer Science at The University of Memphis.
- Practiced Desire2Learn (D2L) web-based learning platform to design the course contents and exam questions.
- Prepared the homework, midterm, and final exam questions and graded them.
- Lectured on different topics in the class.
- Assisted students with understanding the course materials and in-class quizzes after regular class hours.
- Scored **50** out of **60** on SPEAK test to serve as an instructor for undergraduate courses in Computer Science.

### **Master's Study**

#### **Undergraduate Courses**

- Worked as a teaching assistant to grade assignments, projects, and quizzes and lectured some classes.
- Courses include Electrical/Computer Engr. Concepts (EECE 1202), Probabilistic System Analysis (EECE 4235/6235), Signals and Systems (EECE 3203).

### **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.

### **Research Projects**

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

**Duration:** September 2014- December 2016.

**Responsibilities:**

- Work as a key person to implement the prototype for adaptive selection of MFA incorporating the biometric and non-biometric authentication modalities.
- Supervise a team of one master's student and two undergraduate students regarding their assigned tasks to meet project deadlines.
- Prepare monthly status reports of the project including the completed tasks, pending tasks, and future tasks.
- Prepare documentation for all the developed codes and the hardware sensors used to develop A-MFA.
- Assist doctoral supervisor to write grants to extend A-MFA system.
- Work with The University of Memphis Technology Transfer and Innovation team to design marketing flyer and business plan to commercialize implemented a prototype.

**Project Title:** Act Online

**Funding Agency:** Federal Emergency Management Agency (FEMA)

**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

**Funding Agency:** National Science Foundation (NSF)

**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.

**Project Title:** Negative Authentication System (NAS)

**Funding Agency:** Intelligence Advanced Research Projects Activity (IARPA), DARPA.

**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.
- Prepared monthly progress reports being submitted to the funding agency.

## Research Publications

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- A. 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.
- B. 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.
- C. 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.
- D. Sanjib Kumar Saha, Abhijit Kumar Nag, and Dipankar Dasgupta. "Human-Cognition-Based CAPTCHAs." IT Professional 17, no. 5 (2015): 42-48.
- E. 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.
- F. 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.
- G. Dipankar Dasgupta, Abhijit Kumar Nag, and Arunava Roy. "Adaptive multi-factor authentication system." U.S. Patent Application 14/968,676, filed December 14, 2015.

- H. Dipankar Dasgupta, Abhijit Kumar Nag, Denise Ferebee, Sanjib Saha, Kul Subedi, Alvaro Madero, Abel Sanchez, John William. Design and Implementation of Negative Authentication System. Submitted in International Journal of Information Security [under review].
- I. Dipankar Dasgupta, Arunava Roy and Abhijit Kumar Nag, Advances in User Authentication, to be published in Springer in Series "InfoSys Science Foundation Series in Applied Sciences and Engineering" [under press].

## Services and Professional Development

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- Completed instructional training on Canvas L3 course, attended various webinars on Assignment, Discussion, and Quiz design on Canvas platform.
- Attended TS3 webinar "High-Impact Practices in States" on Spring 2017.
- Completed "Effective Question Development for eLearning (EOD)" course organized by Texas A&M University on Spring 2017.
- Participated the discussion on-campus organized by "We End Violence" program in Spring 2017.

## Awards and Honors

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- **Best Paper Runner-up** Award for the conference paper, entitled "**An Adaptive Approach for Continuous Multi-factor Authentication in an Identity Eco-System**" in 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.
- Received Student Graduate Professional Scholarship for 2008-2009 academic year at Wayne State University.
- Position in Dean's list in last two semesters during undergraduate studies in 2006-2007.

## Travel Grant Awards

- Received travel grant from Computer Science department for the paper presentation at Albany, New York, 2014.
- Received travel grant from Intelligence Advanced Research Projects Activity (**IARPA**) for final demo presentation at Baltimore, Maryland, 2013.
- Received travel grant from Student Government Association (**SGA**) for paper presentation at Orlando, Florida, 2014.
- Received travel grant from federally funded project to attend **IARPA** Odin Proposers' Day, 2016.
- Received travel grant from federally funded project to present project progress at Oak Ridge National Laboratory, 2015.
- Received grant to attend International Conference on Design of Experiments (ICODOE 2016), May 10-13, 2016.
- Received **NSF travel grant** to attend ATE Principal Investigator Conference at Washington DC, October 26-28, 2016.

## Volunteer Professional Activities

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1. Reviewer of 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-)
2. Reviewer of the peer-reviewed conferences
    - World Multi-Conference on Systemics, Cybernetics, and Informatics (**WMSCI**) (2015-)
    - IEEE Symposium Series on Computational Intelligence (**SSCI**) (2014-)
    - Hawaii International Conference on System Sciences (**HICSS**) (2016-)
  3. Mid-South Cyber Summit, Center for Information Assurance (CfIA), The University of Memphis (2012-2016)
    - Worked as a coordinator to organize volunteers and other administrative tasks.
    - Prepared the annual report incorporating the speakers' notes and conference attendees' feedback.
    - Helped in managing the sponsors and registration process for the attendees of the event.
  4. Graduate School Recruitment and Information Fair, The University of Memphis (2014-2016)
    - Participated as a student volunteer in the Fall and Spring semesters to represent the Computer Science department.
    - Demonstrated the current research initiatives and graduate courses of the CS department to the participants and presented a demo of different ongoing projects.
  5. GenCyber Boot Camp, 2016 for High School and Middle School students  
Organized by Center for Information Assurance (CfIA) and Department of Computer Science, The University of Memphis (<http://www.memphis.edu/cfia/projects/gencyber.php>).
    - Provided lecture as an instructor on the strength of password security and usage of the secure password to prevent identity theft on June 20, 2016, and July 25, 2016.
    - Showed demos on the Puzzle-Based Learning (PBL) (NSF funded) and Adaptive Multi-Factor Authentication (A-MFA) (NSA funded) projects on June 22-23, 2016 and July 27-29, 2016.
  6. Participated in Research Grant meeting in IARPA Odin Proposers' Day, 2016 at University of Maryland, College Park, MD.
  7. Presented the Puzzle-Based Learning (PBL) demo in May 2016, to faculties of six community colleges in the southern region as part of the NSF-ATE grant.
  8. Participated in Teaching Effectiveness Workshop at FedEx Institute of Technology, The University of Memphis on August 19, 2016.
  9. Attended Ransomware Workshop by Federal Bureau of Investigation (FBI), Memphis Division on August 22, 2016, at FedEx Institute of Technology, The University of Memphis to explore the current security trends and vulnerabilities.
  10. Attended NSF ATE Principal Investigators Conference in Washington DC, October 26-28, 2016 to present the NSF-funded Puzzle-based Learning project.
  11. Presented "Puzzle-Based Learning for Cyber Security Education" at National Initiative for Cyber Security Education (NICE) K-12 Group Meeting on November 09, 2016.
  12. Presented "Puzzle-Based Learning for Cyber Security Education" at Second Annual Innovation Showcase at The University of Memphis on December 01, 2016.
  13. IEEE and ACM Professional Member, 2017- present.