

IEEE CIS Distinguished Lecturer Program

IEEE CIS Malaysia Chapter invites you to a Distinguished Lecture by **Prof Dipankar Dasgupta** from The University of Memphis.



Dr. Dipankar Dasgupta is a professor of Computer Science at the University of Memphis since 1997, an IEEE Fellow, an ACM Distinguished Speaker (2015-2020) and an IEEE Distinguished Lecturer (2022-2024). Dr. Dasgupta is known for his pioneering work on the design and development of intelligent solutions inspired by natural and biological processes. During 1990-2000, he extensively studied different AI/ML techniques and research in the development of an efficient search and optimization method (called structured genetic algorithm) has been applied in engineering design, neural-networks, and control systems. He is one of the founding fathers of the field of artificial immune systems (a.k.a Immunological Computation) and is at the forefront of applying bio-inspired approaches to cyber defense.

His notable works in digital immunity, negative authentication, cloud insurance modeling, dual-filtering and adaptive multi-factor authentication demonstrated the effective use of various AI/ML algorithms. His research accomplishments and achievements have appeared in Computer World Magazine, NASA's website, and in local TV Channels and Newspapers. Dr. Dasgupta has authored four books, 5 patents (including 2 under submissions) and have more than 300 research publications (20,000 citations as per google scholar) in book chapters, journals, and international conference proceedings. Among many awards, he was honored with the 2014 ACM-SIGEVO Impact Award for his seminal work on negative authentication, an AI-based approach. He also received five best paper awards in different international conferences and has been organizing IEEE Symposium on Computational Intelligence in Cyber Security at SSCI since 2007. Dr. Dasgupta is an ACM Distinguished Speaker, regularly serves as panelist and keynote speaker and offer tutorials in leading computer science conferences and have given more than 350 invited talks in different universities and industries.

Adaptive Multi-Factor Authentication and Cyber Identity

Authentication is a critical part to ensure the identity of a legitimate user. During authentication, an individual's credential is validated with a specific computational technique to determine the association of the user with his/her claimed identity. In this talk, I will discuss an adaptive multi-factor authentication (A-MFA) framework which uses adaptive selection of multiple modalities at different operating environment so to make authentication strategy unpredictable to hackers. This methodology incorporates a novel approach of calculating trustworthy values of different authentication factors while the computing device being used under different environmental settings. Accordingly, a subset of authentication factors is determined (at triggering events) on the fly thereby leaving no exploitable a priori pattern or clue for adversaries. Such a methodology of adaptive authentication selection can provide legitimacy to user transactions with an added layer of access protection that is not rely on a fixed set of authentication modalities. Robustness of the system is assured by designing the framework in such a way that if any modality data get compromised, the system can still perform flawlessly using other non-compromised modalities. Scalability can also be achieved by adding new and/or improved modalities with existing set of modalities and integrating the operating/configuration parameters for the added modality.

I will highlight what type of evaluation be required for such identity management software to detect possible deep fakes and other forms of faking biometrics. Other attacks on current means of identity validation may become possible. What would be what good figures of merit to be used as response variables? What are good factors over which we would need to test for next generation identity eco-system

**Save the date and
please register [here](#).**

****Light lunch is provided***

**Wednesday, 7th December 2022
10 am – 12 pm
The Cubes, Block A, Faculty of Computer
Science and Information Technology,
University of Malaya**

&

**Wednesday, 7th Dec 2022
10 am – 12 pm
Google Meet**

IEEE CIS Distinguished Lecture Program

By Prof Dipankar Dasgupta, The University of Memphis

Date of Event: 7th December 2022
Time: 10 AM – 12 PM (GMT+8)
Event Platform: Physical (The Cubes, Block A, Faculty of Computer Science and Information Technology, Universiti Malaya) and Virtual (MS Teams)

Hosted by: IEEE Computer Intelligence (CIS) Malaysia Chapter
Coordinator: Dr Veronica Lestari Jauw
(Veronica.Jauw@nottingham.edu.my)
Executive Committee, IEEE CIS Malaysia Chapter

Attendance: 30 (Registered)
DLP Title: Adaptive Multi-Factor Authentication & Cyber Identity

Abstract

Authentication is a critical part to ensure the identity of a legitimate user. During authentication, an individual's credential is validated with a specific computational technique to determine the association of the user with his/her claimed identity. In this talk, I will discuss an adaptive multi-factor authentication (A-MFA) framework which uses adaptive selection of multiple modalities at different operating environment so to make authentication strategy unpredictable to hackers. This methodology incorporates a novel approach of calculating trustworthy values of different authentication factors while the computing device being used under different environmental settings. Accordingly, a subset of authentication factors is determined (at triggering events) on the fly thereby leaving no exploitable a priori pattern or clue for adversaries. Such a methodology of adaptive authentication selection can provide legitimacy to user transactions with an added layer of access protection that is not rely on a fixed set of authentication modalities. Robustness of the system is assured by designing the framework in such a way that if any modality data get compromised, the system can still perform flawlessly using other non-compromised modalities. Scalability can also be achieved by adding new and/or improved modalities with

existing set of modalities and integrating the operating/configuration parameters for the added modality.

I will highlight what type of evaluation be required for such identity management software to detect possible deep fakes and other forms of faking biometrics. Other attacks on current means of identity validation may become possible. What would be what good figures of merit to be used as response variables? What are good factors over which we would need to test for next generation identity eco-system.

Bibliography

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Events







List of Participants

Full Name	Affiliations	IEEE Member (Y/N)
Ahmed Mubarak Al-Haiqi	Universiti Tenaga Nasional	Y
Weng Kin LAI	Tunku Abdul Rahman University of Management and Technology	Y
Abdullahi Mujaheed Saleh	UTP	Y
Firdaus bin Fakhir Khan	University of Nottingham Malaysia Campus	N
Ihab T Patel	University of Nottingham Malaysia Campus	N
Loo Xuen Yi	University of Nottingham Malaysia Campus	N
Binu R.Chandran	VLSI Technical Manager	Y
Mohammed Salih Mohammed Gismalla	Postdoctoral Researcher	Y
Lim Zhi Yi	University of Nottingham Malaysia Campus	N
Mustafa Subhi Kamal	Student	Y
Teoh Bak Aun	UTeM	N
Yap Pei Shan	University of Nottingham Malaysia Campus	N
Wong Thein Lai	Tunku Abdul Rahman University of Management and Technology	N
Christopher Lazarus	Tunku Abdul Rahman University of Management and Technology	N
Zeeshan Ahmad Arfeen	The Islamia University of Bahawalpur	Y
Veronica Lestari Jauw	University of Nottingham Malaysia Campus	Y
WALISIJANG TAYIER	Center for advanced materials and intelligent manufacturing, FOEBEIT, SEGi University	N
Lourdes P. Lasian	UCSI	N
YEAP SWEE PIN	UCSI	N
Wang Fei	UCSI	N
Lim Chern Hong	Monash University Malaysia	Y
Hoo Wai Lam	Universiti Malaya	Y
Lim Chee Kau	Universiti Malaya	Y
NOMAN MAZHAR	PHD	N
Yong Zuo Jun	Universiti Malaya	N
Qiao Xianpeng	University of Nottingham Malaysia Campus	N
Nursabrina Abdul Jalil	Universiti Malaya	N
Chen, Yi-Lee	Yuan Ze University (Taiwan) / UCSI	N

WENBO	Universiti Malaya	N
Nik Ahmad Haiqal Ashraf	UNITEN	Y