

Distinguished Seminar Series on Data Science & Artificial Intelligence

Sharing Secret Message Using Meaningful Digital Images with Cheating Detection

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📅 27 May 2024 (Mon)

🕒 16:00 - 17:00 (HKT, UTC+8)

📍 Online via Zoom / N003

🗣️ English

✍️ Please register at <https://polyu.hk/jHQfv>
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All are welcome!

Abstract

Secret sharing is an important technique to ensure well protection of transmitted information by dividing a secret message into several shadows that are held among a set of participants. In this talk, I will introduce a novel secret sharing method using two meaningful digital images with cheating detection. It allows a dealer to share a secret message into two different meaningful images through the guidance of the turtle shell magic matrix. Then, after performing a permutation operation, two meaningful shadow images are generated and distributed to two participants. The secret message can be reconstructed only when both participants cooperate by releasing real shadow images. Honest participant in this method can easily detect whether the other participant is cheating via presenting a faked shadow. Experimental results show that this method ensures high quality of shadow images and good embedding capacity. The cheating detection process is also effective and very easy to implement.

About the Speaker

Prof. Chang has worked on many different topics in information security, cryptography, multimedia image processing and published several hundreds of papers in international conferences and journals and over 37 books. He was cited over 46,765 times and has an h-factor of 98 according to Google Scholar. Several well-known concepts and algorithms were adopted in textbooks. He also worked with the National Science Council, Ministry of Technology, Ministry of Education, Ministry of Transportation, Ministry of Economic Affairs and other Government agencies on more than 100 projects and holds 33 patents, including one in US and sixteen in China. He served as Honorary Professor, Consulting Professor, Distinguished Professor, Guest Professor at over 60 academic institutions and received Distinguished Alumni Award's from his Alma Master's. He also served as Editor or Chair of several international journals and conferences and had given almost a thousand invited talks at institutions including Chinese Academy of Sciences, Academia Sinica, Tokyo University, Kyoto University, National University of Singapore, Nanyang Technological University, The University of Hong Kong, National Taiwan University and Peking University. Professor Chang has mentored 7 postdoctoral, 66 PhD students and 202 master students, most of whom hold academic positions at major national or international universities. He has been the Editor-in-Chief of Information Education, a magazine that aims at providing educational materials for middle-school teachers in computer science. He is a leader in the field of information security of Taiwan. He founded the Chinese Cryptography and Information Security Association, accelerating information security the application and development and consulting on the government policy. He is also the recipient of several awards, including the Top Citation Award from Pattern Recognition Letters, Outstanding Scholar Award from Journal of Systems and Software, and Ten Outstanding Young Men Award of Taiwan. He was elected as a Fellow of IEEE in 1998, a Fellow of IET in 2000, a Fellow of CS in 2020, an AAIA Fellow in 2021, a Member of the Academy of Europe (AE) in 2022, and a Member of the European Academy of Sciences and Arts (EASA) in the same year for his contribution in the area of information security. In 2023, he was awarded the Honorary Ph.D. Degree in Engineering, National Chung Cheng University, Taiwan.