Teh Je Sen
Curriculum Vitae
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PERSONAL PROFILE

Passionate, early-career academic with over 4 years of experience teaching Computer Science courses at the college/university level. Published over 30 articles in peer-reviewed journals and reputable conferences. Currently supervising 6 Ph.D. and 3 M.Sc. candidates. Graduated 1 Ph.D. and 2 M.Sc. candidates. Research interests include cryptography, cryptanalysis, machine learning and chaos theory.

EDUCATION

2017   Ph.D. in Computer Science, School of Computer Sciences, Universiti Sains Malaysia
Thesis: Symmetric Encryption Schemes Based on Non-Deterministic Random Numbers and Chaotic Maps

2013   M.Sc. in Computer Science, School of Computer Sciences, Universiti Sains Malaysia
Dissertation: Parallel Chaotic Hash Function Based on The Shuffle-Exchange Network

2011   B. Eng. in Electronics, Faculty of Engineering, Multimedia University, Malaysia

EMPLOYMENT

2017   Senior Lecturer, School of Computer Sciences, Universiti Sains Malaysia

2017   Lecturer, School of Engineering and Technology, Inti International College Penang, Malaysia

2013   Part-time Lecturer, Disted College, Malaysia

2011   Graduate Trainee, Design Automation, Intel Corporation, Malaysia

2010   Intern, Design Automation, Intel Corporation, Malaysia

PUBLICATIONS (Visit my Google Scholar page for a complete listing)

2021   R. Awadallah*, A. Samsudin*, **J. S. Teh**, M. Almazrooie, "An Integrated Architecture for Maintaining Security in Cloud Computing Based on Blockchain," *IEEE Access*, 2021. DOI: 10.1109/ACCESS.2021.3077123

2021   W. H. Alshoura*, Z. Zainol*, **J. S. Teh***, M. Alawida, A. Alabdulatif, "Hybrid SVD-based Image Watermarking Schemes: A Review," *IEEE Access*, 2021. DOI: 10.1109/ACCESS.2021.3060861

2021   M. Alawida*, A Samsudin*, N Alajarmeh, **J. S. Teh**, M. Ahmad, W. H. Alshoura, "A Novel Hash Function based on a Chaotic Sponge and DNA Sequence," *IEEE Access*, 2021. DOI: 10.1109/ACCESS.2021.3049881

2020   D. R. Ibrahim, R. Abdullah, **J. S. Teh***, "An enhanced color visual cryptography scheme based on the binary dragonfly algorithm," *International Journal of Computers and Applications*, 2020. DOI: 10.1080/1206212X.2020.1859244

2020 J. L. S. Yan*, **J. S. Teh**, A. M. Kassim, C. W. Kee, R. Abdullah, "Girls2Code: Cultivating interest in programming among young girls in Malaysia by making drawings come to life," *STEM Education for Girls and Women: Breaking Barriers and Exploring Gender Inequality in Asia*, UNESCO Publications, 2020.

2020 D. R. Ibrahim, **J. S. Teh***, R. Abdullah, "Multifactor authentication system based on color visual cryptography, facial recognition, and dragonfly optimisation," *Information Security Journal: A Global Perspective*, 2020. DOI: 10.1080/19393555.2020.1817633

2020 Z. Chen, J. Chen*, W. Meng, **J. S. Teh**, P. Li, B. Ren, "Analysis of differential distribution of lightweight block cipher based on parallel processing on GPU," *Journal of Information Security and Applications*, 2020. DOI: 10.1016/j.jisa.2020.102565

2020 W-Z. Yeoh, **J. S. Teh***, J. Chen, "Automated Search for Block Cipher Differentials: A GPU-Accelerated Branch-and-Bound Algorithm," in the *25th Australasian Conference on Information Security and Privacy (ACISP 2020)*, *Lecture Notes in Computer Science*, vol. 12248, pp. 160-179. DOI: 10.1007/978-3-030-55304-3_9

2020 **J. S. Teh***, W. Teng, A. Samsudin, J. Chen, "A Post-processing Method for True Random Number Generators based on Hyperchaos with Applications in Audio-based Generators", *Frontiers of Computer Science*, 2020. DOI: 10.1007/s11704-019-9120-2

2020 T. R. Lee, **J. S. Teh***, J. S. Y. Liew, N. Jamil, W-Z. Yeoh, "A Machine Learning Approach to Predicting Block Cipher Security," in the *7th International Cryptology and Information Security Conference 2020 (CRYPTOLOGY 2020)*.

2020 M. Alawida*, **J. S. Teh***, D. P. Oyinloye, W. H. Alshoura, M. Ahmad, R. S. Alkhawaldeh, "A New Hash Function Based on Chaotic Maps and Deterministic Finite State Automata," *IEEE Access*, 2020. DOI: 10.1109/ACCESS.2020.3002763

2020 **J. S. Teh***, M. Alawida, A. Samsudin, "Generating True Random Numbers Based on Multicore CPU Using Race Conditions and Chaotic Maps," *Arabian Journal for Science and Engineering*, 2020. DOI: 10.1007/s13369-020-04552-0

2020 W. H. Alshoura, Z. Zainol, **J. S. Teh***, M. Alawida, "A New Chaotic Image Watermarking Scheme Based on SVD and IWT, "*IEEE Access*, 2020. DOI: 10.1109/ACCESS.2020.2978186

2020 **J. S. Teh***, M. Alawida, J. J. Ho, "Unkeyed hash function based on chaotic sponge construction and fixed-point arithmetic," *Nonlinear Dynamics*, 2020. DOI: 10.1007/s11071-020-05504-x

2020 W-Z. Yeoh, **J. S. Teh***, M. I. S. M. Sazali, "μ^2: A lightweight block cipher", in the *6th International Conference on Computational Science and Technology (ICCST 2019)*, *Lecture Notes in Electrical Engineering*, vol. 603, pp 281-290. DOI: 10.1007/978-981-15-0058-9_27

2019 Y. Zhang, J. Chen*, K. Chen, R. Xu, **J. S. Teh**, S. Zhang, "Network traffic identification of several open source secure proxy protocols," *International Journal of Network Management*, 2019. DOI: 10.1002/nem.2090

2019 **J. S. Teh***, M. Alawida, Y. C. Sii, "Implementation and practical problems of chaos-based cryptography revisited," *Journal of Information Security and Applications*, 2019. DOI: 10.1016/j.jisa.2019.102421

2019 M. Alawida*, A. Samsudin, **J. S. Teh***, "Enhanced digital chaotic maps based on bit reversal with applications in random bit generators," *Information Sciences*, 2019. DOI: 10.1016/j.ins.2019.10.055

2019 M. Alawida*, A. Samsudin, **J. S. Teh**, W. H. Alshoura, "Deterministic chaotic finite state automata", *Nonlinear Dynamics*, 2019. DOI: 10.1007/s11071-019-05311-z

2019   M. Alawida*, A. Samsudin, **J. S. Teh***, "Digital cosine chaotic map for cryptographic applications, *IEEE Access* 7. DOI: 10.1109/ACCESS.2019.2947561

2019   M. Alawida, A. Samsudin, **J. S. Teh***, "Enhancing unimodal digital chaotic maps through hybridisation," *Nonlinear Dynamics*, vol. 96(1), pp 601-613. DOI: 10.1007/s11071-019-04809-w

2019   M. Alawida, **J. S. Teh***, A. Samsudin, W. H. Alshoura, "An image encryption scheme based on hybridizing digital chaos and finite state machine", *Signal Processing*, vol. 164, pp 249-266. DOI: 10.1016/j.sigpro.2019.06.013

2019   M. Alawida*, M. Samsudin, **J. S. Teh**, R. S. Alkhawaldeh, "A new hybrid digital chaotic system with applications in image encryption", *Signal Processing*, vol. 160, pp 45-58. DOI: 10.1016/j.sigpro.2019.02.016

2019   D. R. Ibrahim, R. Abdullah, **J. S. Teh***, B. Alsalibi, "Authentication for ID cards based on colour visual cryptography and facial recognition", in the *3rd International Conference on Cryptography, Security and Privacy (ICCSP 2019)*. DOI: 10.1145/3309074.3309077

2018   W-Z. Yeoh, **J. S. Teh***, H. R. Chern, "A parallelizable chaos-based true random number generator based on mobile device cameras for the Android platform", *Multimedia Tools and Applications*, vol. 78(12), pp 15929-15949. DOI: 10.1007/s11042-018-7015-0

2018   **J. S. Teh***, K. Tan, M. Alawida, "A chaos-based keyed hash function based on fixed point representation", *Cluster Computing*, Volume 22(2), pp 649-660. DOI: 10.1007/s10586-018-2870-z

2017   J. Chen, **J. S. Teh**, Z. Liu, C. Su, A. Samsudin, Y. Xiang, "Towards Accurate Statistical Analysis of Security Margins: New Searching Strategies for Differential Attacks", *IEEE Transactions on Computers*, vol. 66(10), pp 1763-1777. DOI: 10.1109/TC.2017.2699190

2017   **J. S. Teh**, A. Samsudin*, "A Stream Cipher based on Spatiotemporal Chaos and True Random Synchronization", *IETE Journal of Research*, vol. 63(3), pp 346-357. DOI: 10.1080/03772063.2017.1284617

2017   **J. S. Teh**, A. Samsudin*, "A Chaos-based Authenticated Cipher with Associated Data", *Security and Communication Networks*, vol. 2017, Article ID 9040518. DOI: 10.1155/2017/9040518

2016   **J. S. Teh***, W. Teng, A. Samsudin, "A true random number generator based on hyperchaos and digital sound", in the *3rd International Conference on Computer and Information Sciences (ICCOINS 2016)*. DOI: 10.1109/ICCOINS.2016.7783225

2016   J. Chen*, **J. S. Teh***, C. Su, A. Samsudin, J. Fang, "Improved (related-key) Attacks on Round-Reduced KATAN-32/48/64 Based on the Extended Boomerang Framework", in the *21st Australasian Conference on Information Security and Privacy (ACISP 2016)*, *Lecture Notes in Computer Science*, vol. 9723, pp 333-346. DOI: 10.1007/978-3-319-40367-0_21

2016   J. Chen*, A. Miyaji, C. Su, **J. S. Teh**, "Accurate Estimation of the Full Differential Distribution for General Feistel Structures", in the *11th International Conference on Information Security and Cryptology (INSCRYPT 2015)*, *Lecture Notes in Computer Science*, vol. 9589, pp 108-124. DOI: 10.1007/978-3-319-38898-4_7

2016   J. Chen*, A. Miyaji, C. Su, **J. S. Teh**, "Improved differential characteristic searching methods", in the *IEEE 2nd International Conference on Cyber Security and Cloud Computing (CSCloud 2015)*. DOI: 10.1109/CSCloud.2015.42

2015   **J. S. Teh**, A. Samsudin*, M. Al-Mazrooie, A. Akhavan, "GPUs and chaos: a new true random number generator", *Nonlinear Dynamics*, vol. 82(4), pp 1913-1922. DOI: 10.1007/s11071-015-2287-7

2015   **J. S. Teh**, A. Samsudin*, A. Akhavan, "Parallel chaotic hash function based on the shuffle-exchange network", *Nonlinear Dynamics*, vol. 81(3), pp 1067-1079. DOI: 10.1007/s11071-015-2049-6

AWARDS / HONOURS

2019   Sanggar Sanjung Publication Award, Universiti Sains Malaysia
2018   Innovations in Teaching and Learning Competition (Bronze Medal), Universiti Sains Malaysia
2017   Teaching Innovation Award, Inti International College Penang
2015   Sanggar Sanjung Publication Award, Universiti Sains Malaysia

GRANTS / FELLOWSHIPS / RESEARCH PROJECTS

Principle Investigator

2019   Investigating the relationship between lightweight block cipher constructs and differential cluster distribution using GPU-optimized branch-and-bound strategies, Fundamental Research Grant Scheme, Malaysia MOE, MYR 107,800, 3 years
2018   The Design of Lightweight Chaos-based Symmetric-key Cryptosystems for Constrained Environments, Short Term Grant, Universiti Sains Malaysia, MYR 29,000, 2 years

Co-Investigator

2020   A zero-divisor code approach in cryptography with application to public key encryption scheme, Malaysia MOE, MYR109430, 3 years
2020   Blockchain for Data Analytics, Long Term Research Grant Scheme, Malaysia MOE, MYR100,800, 3 years
2018   A Study on the Accurate Security Margin of Symmetric Key Cryptography Against Statistical Attack, National Natural Science Foundation of China, RMB 250,000, 3 years
2014   Novel Symmetric Encryption Scheme based on True Random Numbers and Chaotic Maps, Fundamental Research Grant Scheme, Malaysia MOE, MYR68,100, 2.5 years

INVITED TALKS/TRAINING/WORKSHOPS

2020   Blockchain Technology and Applications, Keysight Data Science Program (2nd Cohort), December 14 and 21 (Full day workshops)
2019   Where to Publish? Tips to find Good Venues and avoiding Predatory Journals, School of Computer Sciences, Universiti Sains Malaysia, Nov 22
2019   Blockchain Technology and Applications, Keysight Data Science Program, October 7 and 14 (Full day workshops)
2018   LaTeX Workshop, School of Computer Sciences, Universiti Sains Malaysia, 23 July
2018   Developing an Effective Thesis, Inti International College Penang, Feb 18

CONFERENCE ACTIVITY

Papers Presented

2016   Improved (related-key) Attacks on Round-Reduced KATAN-32/48/64 Based on the Extended Boomerang Framework, 21st Australasian Conference on Information Security and Privacy (ACISP 2016), July 4-6

Organising Committee

2019   Poster Publication Chair, IEEE National Postgraduate Poster Competition

Technical Committee

2021   Third International Conference on Advances in Cyber Security (ACeS 2021)
2021   Second International Symposium on Emerging Information Security and Applications (EISA 2021)
2021   International Conference on Recent Advances in Sustainable Energy Research (RAISER 2021)
2020   International Conference on Advances in Cyber Security (ACeS 2020)
2020   Australasian Conference on Information Security and Privacy (ACISP 2020)
2020   International Symposium on Emerging Information Security and Applications (EISA 2020)
2019   3rd International Conference on Cryptography, Security and Privacy (ICCSP 2019)

TEACHING EXPERIENCE

Universiti Sains Malaysia

Design and Analysis of Algorithms (4 terms)
Database Organisation and Design (3 terms)
Information Security and Cryptography (2 terms)
Programming and Data Structures (1 term as teaching assistant)

Inti International College Penang

Program Logic Formulation (1 term)
Information Technology (2 terms)
Software Quality and Process Management (1 term)

Disted College
C++ Programming and Data Structures (1 term)

RESEARCH EXPERIENCE

2015   Research Assistant, Miyaji Laboratory, Japan Advanced Institute of Science and Technology, February 1 – March 31. Developed algorithms for the cryptanalysis of lightweight block ciphers.

CERTIFICATIONS

2019   Certified Professional Trainer, Human Resources Development Fund (HRDF), Ministry of Human Resources Malaysia

SERVICE TO PROFESSION

Peer Reviewer (Visit my Publons page for verification and the full listing)

Scientific Reports, IEEE Internet of Things Journal, IEEE Transactions on Very Large Scale Integration (VLSI) Systems, IEEE Access, IEEE Transactions on Multimedia, Signal Processing, Optics & Laser Technology, Journal of Information Security and Applications, Wireless Personal Communications, KSII Transactions on Internet and Information Systems, IET Image Processing, Scientia Iranica, Recent Patents on Computer Science, Indonesian Journal of Electrical Engineering and Computer Science

Consultancy/Others

2020   Cryptographic Algorithm Security Analyst, Threat Modelling Platform for Industrial Control Systems and Internet of Everything, UNITEN R&D Sdn. Bhd.
2019   Academic Advisor, Diploma of Innovative Computing, Inti International College Penang (ongoing)
2018   Evaluation Panel, National Trusted Cryptographic Algorithm List (MySEAL), CyberSecurity Malaysia and the Ministry of Communications and Multimedia Malaysia (ongoing)

COMMUNITY INVOLVEMENT

2021   Girls in ICT – CodeMaven 1.0 Virtual Coding Workshops
2020   Google Developers Student Club - USM Advisor
2020   IEEE Innovation Nation Malaysia – Mentor for CodingLabs team
2019   National Instruments Autonomous Robotics Competition 2019
2019   Girls in ICT – Organized and conducted two programming workshops for primary school girls
2018   National Instruments Autonomous Robotics Competition 2018
2018   Community Project with the Tangkai Cermin Aboriginal People – Organized and conducted workshop for the aboriginal children of Tangkai Cermin village
2018   CSGuru Initiative – Collaboration with Telebort to host free programming classes for primary school children

LANGUAGES

English   Reading (Fluent), Speaking (Fluent), Writing (Fluent)
Malay   Reading (Good), Speaking (Good), Writing (Good)

GRADUATE STUDENT SUPERVISION

Ongoing

2020   Abubakar Abba (Ph.D.) – Cryptography, chaos theory
2020   Mohamed Fadul Iedres Fadul (Ph.D.) – Cryptanalysis, deep learning
2020   Teng Wei Jian (Ph.D.) – Cryptanalysis, deep learning
2019   Wafa' Hamdan Alshoura (Ph.D.) – Image watermarking, chaos theory
2019   Oyinloye Damilare Peter (Ph.D.) – Blockchain, consensus protocols
2018   Ibrahim Dyala Rasheed Subhi (Ph.D.) – Multifactor authentication, visual cryptography, facial recognition
2018   Lee Ting Rong (M.Sc.) – Cryptanalysis, machine learning

Graduated

2020   Yeoh Wei Zhu (M.Sc.) – Cryptanalysis, parallel processing
2020   Moatsum Khalif Oduh Al Awida (Ph.D.) – Cryptography, chaos theory
2019   Ho Jia Jie (M.Sc.) – Cryptography, chaos theory

REFERENCES

Prof. Dr. Bahari Belaton
School of Computer Sciences, Universiti Sains Malaysia, 11800 USM, Penang, Malaysia
Tel: 60195521109
Email: bahari@usm.my

Prof. Dr. Azman Samsudin
School of Computer Sciences, Universiti Sains Malaysia, 11800 USM, Penang, Malaysia
Tel: 60195701139
Email: azman.samsudin@usm.my

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Assoc. Prof. Dr. Jiageng Chen
Central China Normal University, 152 Louyu Road, Wuhan, Hubei, China 430079
Tel: 13667225206
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