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## PROFESSIONAL EXPERIENCE

<b>Professor</b> <i>Universiti Malaya, Malaysia.</i>	2022 - Present
<b>Under Secretary (Data Strategic and Foresight)</b> <i>Ministry of Science, Technology and Innovation (MOSTI), Malaysia.</i>	2020 - 2022
<b>Associate Professor</b> <i>Universiti Malaya, Malaysia.</i>	2017 - 2022
<b>Deputy Dean (Research &amp; Development)</b> <i>Faculty of Comp. Sci., &amp; Info, Tech. Universiti Malaya, Malaysia.</i>	2019 - 2020
<b>Head of Department (Artificial Intelligence)</b> <i>Faculty of Comp. Sci., &amp; Info, Tech. Universiti Malaya, Malaysia.</i>	2017 - 2019
<b>Senior Lecturer</b> <i>Universiti Malaya, Malaysia.</i>	2010 - 2017

## EDUCATION

<b>Doctor of Philosophy (Ph.D.)</b> <i>University of Portsmouth, Portsmouth, U.K.</i> Thesis: Fuzzy Qualitative Human Motion Analysis	2008
<b>M.Sc. Communication Systems Engineering</b> <i>University of Portsmouth, Portsmouth, U.K.</i> Thesis: GPS-SMS Vehicle Tracking System	2005
<b>B.Eng. (Hons) Electronics Engineering</b> <i>Multimedia University, Malaysia</i>	2003

## GRANTS (TOTAL RM 3.3M SECURED AS PI)

- *On-going Projects (only as Principal Investigator (PI) are listed)*
  - **Intellectual Property Protection Of Deep Learning Model (ST041-2021).**  
(MYR 12,000; 2021-2023) – SATU Joint Research Scheme (JRS), Taiwan

- **Visual Question-answering (VQA) System With Once-for All Network And Intel Xeon Avx512 Vnni Platform (PV013-2021).** (MYR 147,600; 2021-2022) – Intel Microelectronics (M) Sdn Bhd, Malaysia.
- **Enhancing Organic Light Emitting Materials Discovery Through Generative Adversarial Network (IIRG005C-19FNW).** (MYR 84,644.40; 2019-2022) – Interdisciplinary Research Grant Scheme (IIRG), University of Malaya, Malaysia.
- **Explainable A.I.: A Fundamental Study to Elucidate The Inner Workings of Artificial Intelligence Models (FP021-2018A).** (MYR 117,000; 2019-2022) - Fundamental Research Grant Scheme (FRGS), Ministry of Higher Education, Malaysia.
- *Completed Projects (only as Principal Investigator (PI) are listed)*
  - **Classification of Oral Lesions using Deep Learning for Elderly Detection of Oral Cancer (MR/S013865/1).** (GBP 145,000 (~ MYR 725,000); 2018-2021) – Pump-Priming, Medical Research Council, U.K.
  - **Connecting Visual Impairment Society with Big Data: An Image Captioning Approach (FG002-17AFR).** (MYR 99,0000; 2017-2019) – Frontier Research Grant, University of Malaya.
  - **Investigating A Zero-shot Learning Model for Improving E-archives Architecture (FP004-2016).** (MYR 64,400; 2016-2018) – Fundamental Research Grant Scheme (FRGS), Ministry of Higher Education, Malaysia.
  - **Intelligent System to Support post-Stroke Rehabilitation (NRCP1516/4/33).** (GBP 12,750 (~ MYR 63,750); 2016-2017) – Newton Research Collaboration Prog., The Royal Academy of Engineering, U.K.
  - **Towards Big Analytics – A Fundamental Framework for Performance Enhancement in Visual Surveillance with Semantically-linked Big Data (FP070-2015A).** (MYR 85,000; 2015-2017) – Fundamental Research Grant Scheme (FRGS), Ministry of Higher Education, Malaysia.
  - **Smart, Safe and Green City – A Crime Prevention System using Smart Vision and Green Environmental Architecture (PR001-2015B).** (MYR 108,500; 2015-2017) – Prototype Research Grant Scheme (PRGS), Ministry of Higher Education, Malaysia.
  - **Understand Human Behaviour for Anomaly Event Detection in Video Sequences (PR023-2012D).** (MYR 90,500; 2013-2016) - University Malaya Research Grant (UMRG), University of Malaya, Malaysia.

- **Intelligent Performance Enhancement Framework for Multi-modal Vision Architecture (I-MViA): Theoretical development, mathematical formulation and computational study (FP027-2013A).** (MYR 147,000; 2013-2016) – Fundamental Research Grant Scheme (FRGS), Ministry of Higher Education, Malaysia.
- **Human-Robot Interaction (HRI) Algorithm in Robot-based Intervention of Elderly with Alzheimer’s (UM.C/625/1/HIR/MOE/FCSIT/08).** (MYR 1,164,850; 2012–2016) - Ministry of Higher Education-High Impact Research Grant (MoHE-HIR), University of Malaya, Malaysia.
- **A Fuzzy Qualitative-based Framework to Understand Human Behaviour (FQ-HuB) (CG065-2013).** (MYR 64,500; 2013-2014) - Program Rakan Penyelidikan UM (PRPUM), University of Malaya, Malaysia.
- **ACCESS – Activity Analysis in Context Specific Scenarios (UM.C/625/1/HIR/037).** (MYR 229,000; 2010–2013) - Chancellery - High Impact Research Grant (Chan-HIR), University of Malaya, Malaysia.
- **Modelling Human Actions by Local Static & Dynamic Descriptor (MALaya) (RG110/11AET).** (MYR 100,000; 2010–2012) – University Malaya Research Grant (UMRG), University of Malaya, Malaysia.

## **PUBLICATIONS (SELECTED)**

### **Journal Articles**

1. Fan, L., Ng, K.W., Chan, C.S. and Yang, Q. (2022) “DeepIPR: Deep Neural Network Ownership Verification with Passports”, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 44(10), pp. 6122-6139.
2. Tan, J.H., Tan, Y.H., Chan, C.S. and Chuah, J.H. (2022) “ACORT – A Compact Object Relation Transformer for Parameter Efficient Image Captioning”, *Neurocomputing*, vol. 482, pp. 60-72.
3. Tan, J.H., Chan, C.S., and Chuah, J.H. (2022) “End-to-End Supermask Pruning: Learning to Prune Image Captioning Models”, *Pattern Recognition*, vol. 122, pp. 108366.
4. Lim, J.H., Chan, C.S., Ng, K.W., Fan, L., and Yang, Q. (2022) “Protect, Show, Attend and Tell: Empowering Image Captioning Models with Ownership Protection”, *Pattern Recognition*, vol. 122, pp. 108285.
5. Japar, N., Kok, V.J. and Chan, C.S. (2021) “Collectiveness Analysis with Visual Attributes”, *Neurocomputing*, vol. 463, pp. 77-90.
6. Lim, Y.Q., Chan, C.S. and Loo, F.Y. (2021) “ClaviNet: Generate Music with Different Musical Styles”, *IEEE MultiMedia*, vol. 28(1), pp. 83-93.
7. Japar, N., Kok, V.J. and Chan, C.S. (2021) “Coherent Group Detection in Still Image”, *Multimedia Tools and Applications*, vol. 80, pp. 22007-22026.

8. Chang, Y.L., Chan, C.S. and Remagnino, P. (2021) "Action Recognition on Continuous Video", *Neural Computing and Applications*, vol. 33(4), pp. 1233-1243.
9. Pang, T., Wong, J.H.D., Ng, W.L. and Chan, C.S. (2021) "Semi-supervised GAN-based Radiomics Model for Data Augmentation in Breast Ultrasound Mass Classification", *Computer Methods and Programs in Biomedicine*, vol. 203, pp. 106018.
10. Chng C.K., Chan, C.S. and Liu, C-L. (2020) "Total-Text: Towards Orientation Robustness in Scene Text Detection", *International Journal on Document Analysis and Recognition*, vol. 23, pp. 31-52.
11. Tan, J.H., Chan, C.S. and Chuah, J.H. (2019) "COMIC: Compact Image Captioning with Attention", *IEEE Transactions on Multimedia*, vol. 21(10), pp. 2668-2696.
12. Loh, Y.P., X. Liang and Chan, C.S. (2019) "Low-light image enhancement using Gaussian Process for features retrieval", *Signal Processing: Image Communication*, vol. 74, pp. 175-190.
13. Tan, Y.H. and Chan, C.S. (2019) "Phrase-based Image Caption Generator with Hierarchical LSTM Network" *Neurocomputing*, vol. 333, pp. 86-100.
14. Loh, Y.P. and Chan, C.S. (2019) "Getting to Know Low-light Images with The Exclusively Dark Dataset", *Computer Vision and Image Understanding*, vol. 178, pp. 30-42.
15. Tan, W.R., Chan, C.S., Aguirre, H. and Tanaka, K. (2019) "Improved ArtGan for Conditional Synthesis of Natural Image and Artwork", *IEEE Transactions on Image Processing*, vol. 28(1), pp. 394-409.
16. Kok, V.J. and Chan, C.S. (2018) "Granular-based Dense Crowd Density Estimation", *Multimedia Tools and Applications*, vol. 77(15), pp. 20227-20246.
17. Lee, S.H., Chan, C.S. and Remagnino, P. (2018) "Multi-Organ Plant Classification based on Convolutional and Recurrent Neural Network", *IEEE Transactions on Image Processing*, vol. 27(9), pp. 4287-4301.
18. Ahmadian, A., Salahshour, S., Chan, C.S. and Baleanu, D. (2018) "Numerical Solutions of Fuzzy Differential Equations by an Efficient Runge-Kutta Method with Generalized Differentiability", *Fuzzy Sets and Systems*, vol. 331, pp. 47-67.
19. Lee, S.H., Chan, C.S., Mayo, S. and Remagnino, P. (2017) "How Deep Learning Extracts and Learns Leaf Features for Plant Classification", *Pattern Recognition*, vol. 71, pp. 1-13.

20. Tan, W.R., Chan, C.S., Aguirre, H.E. and Tanaka, K. (2017) “Fuzzy Qualitative Deep Compression Network”, *Neurocomputing*, vol. 251, pp. 1-15.
21. Kok, V.J. and Chan, C.S. (2017) “GrCS: Granular Computing based Crowd Segmentation”, *IEEE Transactions on Cybernetics*, vol. 47(5), pp. 1157-1168.
22. Ahmadian, A., Salahshour, S. and Chan, C.S. (2017) “Fractional Differential Systems: A Fuzzy Solution based on Operational Matrix of Shifted Chebyshev Polynomials and its Applications”, *IEEE Transactions on Fuzzy Systems*, vol. 25(1), pp. 218-236.
23. Lim, C.H. and Chan, C.S. (2016) “Fuzzy Qualitative Human Model for Viewpoint Identification”, *Neural Computing and Applications*, vol. 27(4), pp. 845-856.
24. Vats, E. and Chan, C.S. (2016). “Early Detection of Human Actions – A Hybrid Approach”, *Applied Soft Computing*, vol. 46, pp. 953-966.
25. Kok, V.J., Lim, M.K. and Chan, C.S. (2016) “Crowd Behaviour Analysis: A Review where Physics meets Biology”, *Neurocomputing*, vol. 177, pp. 342-362.
26. Tang, S. and Chan, C.S. (2016) “Orthogonal Planar Search (OPS) for Coronary Artery Centerline Extraction”, *Signal, Image and Video Processing*, vol. 10(2), pp. 335-342.
27. Vats, E., Lim, C.K. and Chan, C.S. (2015) “An Improved BK Sub-Triangle Product Approach for Scene Classification”, *Journal of Intelligent & Fuzzy Systems*, vol. 29 (5), pp. 1923-1931.
28. Hoo, W.L. and Chan, C.S. (2015) “Recognizing Unknown Objects with Attributes Relationship Model”, *Expert Systems with Application*, vol. 42 (23), pp. 9279-9283.
29. Hoo, W.L. and Chan, C.S. (2015) “Zero-shot Object Recognition System based on Topic Model”, *IEEE Transactions on Human-Machine Systems*, vol. 45(4), pp. 518-525
30. Tang, D., Yusuf, B., Botzheim, J., Kubota, N. and Chan, C.S. (2015) “A Novel Multimodal Communication Framework using Robot Partner for Aging Population”, *Expert Systems with Application*, vol. 42 (9), pp. 4540-4555.
31. Lim, C.H., Vats, E. and Chan, C.S. (2015) “Fuzzy Human Motion Analysis: A Review”, *Pattern Recognition*, vol. 48 (5), pp. 1773-1796.
32. Ahmadian, A., Salahshour, S. and Chan, C.S. (2015) “A Runge-Kutta Method with Reduced Number of Functional Evaluations to Solve Hybrid Fuzzy Differential Equations”, *Soft Computing*, vol. 19(4), pp. 1051-1062.

33. Hoo, W.L. and Chan, C.S. (2015) “Keybook: Unbias Object Recognition using Keywords”, *Expert Systems with Application*, vol. 42 (8), pp. 3991-3999.
34. Salahshour, S., Ahmadian, A. and Chan, C.S. (2015) “Successive Approximation Method for Caputo q-fractional IVPs”, *Communications in Nonlinear Science and Numerical Simulations*, vol. 24 (1-3), pp. 153-158.
35. Lim, C.K. and Chan, C.S. (2015) “A Weighted Inference Engine based on Interval-valued Fuzzy Relational Theory”, *Expert Systems with Application*, vol. 42 (7), pp. 3410-3419.
36. Lee, H.Y., Hoo, W.L. and Chan, C.S. (2015) “Color Video Denoising using Epitome and Sparse Coding”, *Expert Systems with Application*, vol. 42 (2), pp. 751-759.
37. Risnumawan, A., Palaiahnakote, S., Chan, C.S. and Tan, C.L. (2014) “A Robust Arbitrary Text Detection System for Natural Scene Images”, *Expert Systems with Application*, vol. 41 (18), pp. 8027-8048.
38. Lim, C.H.; A. Risnumawan and Chan, C.S. (2014) “Scene Image is Non-Mutually Exclusive – A Fuzzy Qualitative Scene Understanding” *IEEE Transactions on Fuzzy Systems*, vol. 22 (6), pp. 1541-1556.
39. Vembarasan, V., Balasubramaniam, P. and Chan, C.S. (2014) “Robust Synchronization of Uncertain Chaotic Neural Networks with Randomly Occurring Uncertainties and Non-fragile Output Coupling Delayed Feedback Controllers”, *Nonlinear Dynamics*, vol. 78 (3), pp. 2031-2047.
40. Vembarasan, V., Balasubramaniam, P. and Chan, C.S. (2014) “Non-fragile State Observer Design for Neural Networks with Markovian Jumping Parameters and Time-delays”, *Nonlinear Analysis: Hybrid Systems*, vol. 14, pp. 61-73.
41. Lim, M.K., Chan, C.S., Monekosso, D. and Remagnino, P. (2014) “Detection of Salient Regions in Crowded Scenes”, *IET Electronics Letters*, vol. 50 (5), pp. 363-365.
42. Lim, M.K., Tang, S. and Chan, C.S. (2014) “iSurveillance: Intelligent framework for Multiple Events Detection in Surveillance Videos”, *Expert Systems with Applications*, vol. 41 (10), pp. 4704-4715.
43. Lim, M.K., Chan, C.S., Monekosso, D. and Remagnino, P. (2014) “Refined Particle Swarm Intelligence Method for Abrupt Motion Tracking” *Information Sciences*, vol. 283, pp. 267-287.
44. Tan, W.R.; Chan, C.S.; Yogarajah, P. and Condell, J. (2012) “A Fusion Approach for Efficient Human Skin Detection” *IEEE Transactions on Industrial Informatics*, vol. 8(1), pp. 138-147.

45. Lim, C.K. and Chan, C.S. (2011) “Logical Connectives and Operativeness of BK Sub-triangle Product in Fuzzy Inferencing” *International Journal of Fuzzy Systems*, vol. 13(4), pp. 237-245.
46. Chan, C.S. and Liu, H. (2009) “Fuzzy Qualitative Human Motion Analysis” *IEEE Transactions on Fuzzy Systems*, vol. 17(4), pp. 851-862.
47. Chan, C.S., Liu, H. and Brown, D.J. (2007) “Adapting Robot Kinematics for Human-arm Motion Recognition” *International Journal of Knowledge-Based & Intelligent Engineering Systems*, vol. 11(4), 2007, pp.207-217.
48. Chan, C.S., Liu, H. and Brown, D.J. (2007) “Recognition of Human Motion from Qualitative Normalised Templates” *Journal of Intelligent and Robotic Systems*, vol. 48(1), Springer, pp.79-95.

### Refereed Conference Papers

49. Hsu, P., Lin, C-T., Ng, C.C., Kew, J.L., Tan, M.Y., Lai, S-H., Chan, C.S. and Zach, C. “Extremely Low-light Image Enhancement with Scene Text Restoration”, *26th International Conference on Pattern Recognition (ICPR)*, Aug., 2022.
50. Hoe, J.T., Ng, K.W., Zhang, T., Chan, C.S., Song, Y-Z. and Tao, X. “One Loss for All: Deep Hashing with a Single Cosine Similarity based Learning Objective”, *Thirty-fifth Conference on Neural Information Processing Systems (NeurIPS)*, Dec., 2021.
51. Ong, D.S., Chan, C.S., Ng, K.W., Fan, L. and Yang, Q. “Protecting Intellectual Property of Generative Adversarial Networks from Ambiguity Attack”, *IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*, June, 2021.
52. Lim, J.Q. and Chan, C.S. “From Gradient Leakage to Adversarial Attacks in Federated Learning” *IEEE International Conference on Image Captioning (ICIP)*, Anchorage, Alaska, USA, Sept. 2021.
53. Lim, J.H., Tan, C.S., Chan, C.S. Welikala, R.A., Remagnino, P., Rajendran, S., Kallarakkal, T.G., et. al. “D’OraCa: Deep Learning-based classification of Oral Lesions with Mouth Landmark Guidance for Early Detection of Oral Cancer”, *25th UK Conference on Medical Image Understanding and Analysis (MIUA)*, Oxford, U.K, 2021.  
**(Best Student Paper Award)**
54. Fan, L., Ng, K.W., Ju, C., Zhang T. and Chan, C.S. “Deep Polarized Network for Supervised Learning of Accurate Binary Hashing Codes”, *International Joint Conference on Artificial Intelligence (IJCAI)*, Yokohama, Japan, 2020.

55. Lim, Y.Q., Chan, C.S. and Loo, F.Y. “Style-conditioned Music Generation” *IEEE International Conference on Multimedia and Expo (ICME), London, U.K., July 2020.*  
**(Top 10% papers)**
56. Wang, X., Liu, Y., Shen, C., Ng, C.C., Luo, C., Jin, L., Chan, C.S., Hengel, A.v. and Wang, L. “On the General Value of Evidence, and Bilingual Scene-Text Visual Question Answering”, *IEEE International Conference on Computer Vision and Pattern Recognition (CVPR), Washington, USA, June, 2020.*
57. Fan, L., Ng, K.W. and Chan, C.S. “Rethinking Deep Neural Network Ownership Verification: Embedding Passports to Defeat Ambiguity Attacks”, *Thirty-third Conference on Neural Information Processing Systems (NeurIPS), Vancouver, Canada, Dec., 2019.*
58. Lim, J.H. and Chan, C.S. “Mask Captioning Network”, *IEEE International Conference on Image Captioning (ICIP), Taipei, Taiwan, Sept. 2019.*
59. Ng, K.W., Fan, L. and Chan, C.S. “A Universal Logic Operator for Interpretable Deep Convolution Networks” *AAAI Workshop on Network Interpretability for Deep Learning, Hawaii, USA, Jan. 2019.*
60. Hoo, W.L. and Chan, C.S. “Anisotropic Partial Differential Equation based Video Saliency Detection”, *IEEE International Conference on Image Processing (ICIP), Athens, Greece, Oct., 2018.*
61. Chng, C.K. and Chan, C.S. “Total-Text: A Comprehensive Dataset for Scene Text Detection and Recognition”, *14<sup>th</sup> IAPR International Conference on Document Analysis and Recognition (ICDAR), Kyoto, Japan, Nov., 2017.*
62. Tan, W.R., Chan, C.S., Aguirre, H. and Tanaka, K. “ArtGAN: Artwork Synthesis with Conditional Categorical GANs”, *IEEE International Conference on Image Processing (ICIP), Beijing, PR China, Sept., 2017.*
63. Lee, S.H., Chang, Y.L., Chan, C.S. and Remagnino, P. “HGO-CNN: Hybrid Generic-Organ Convolutional Neural Network for Multi-Organ Plant Classification”, *IEEE International Conference on Image Processing (ICIP), Beijing, PR China, Sept., 2017.*
64. Khare, V., Palaiahnakote, S., Ahlad, K., Chan, C.S., Lu, T. and Blumenstien, M. “A Quad Tree based Method for Blurred and Non-blurred Video Text Frames Classification”, *IAPR International Conference on Pattern Recognition (ICPR), Cancun, Mexico, Dec., 2016.*
65. Tan, Y.H. and Chan, C.S. “phi-LSTM: A Phrase-based Hierarchical LSTM Model for Image Captioning”, *Asian Conference on Computer Vision (ACCV), Taipei, Taiwan, Nov., 2016.*



66. Tan, W.R., Chan, C.S., Aguirre, H. and Tanaka, K. “A Deep Convolution Network for Fine-art Paintings Classification”, *Proceedings of the IEEE International Conference on Image Processing (ICIP), Phoenix, USA, Sept., 2016.*
67. Jhavar A., Chan, C.S., Monekosso, D. and Remagnino, P. “Fuzzy-Rough based Decision System for Gait Adopting Instance Selection”, *Proceedings of the IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Vancouver, Canada, July, 2016.*
68. Loh, Y.P., and Chan, C.S. “Unveiling Contrast in Darkness”, *3<sup>rd</sup> Asian Conference on Pattern Recognition (ACPR), Kuala Lumpur, Malaysia, Nov., 2015.*
69. Lee, S.H., Chan, C.S., Wilkin, P. and Remagnino, P. “Deep-Plant: Plant Identification with Convolutional Neural Networks”, *Proceedings of the IEEE International Conference on Image Processing (ICIP), Quebec City, Canada, Sept., 2015.*
70. Salahshour, S., Ahmadian, A., Chan, C.S. and Baleanu, D. “Toward the Existence of Solutions of Fractional Sequential Differential Equations with Uncertainty”, *Proceedings of the IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Istanbul, Turkey, Aug., 2015.*
71. Vats, E., Lim, C.K. and Chan, C.S. “Early Human Actions Detection using BK Sub-triangle Product”, *Proceedings of the IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Istanbul, Turkey, Aug., 2015.*  
**(Best Student Paper Nomination)**
72. Risnumawan, A. and Chan, C.S. “Text Detection via Edgeless Stroke Width Transform”, *International Symposium on Intelligent Signal Processing and Communication Systems (ISPACS), Kuching, Malaysia, Dec., 2014.*
73. Lim, M.K., Kok, V.J., Loy, C.C. and Chan, C.S. “Crowd Saliency Detection via Global Similarity Structure”, *IAPR International Conference on Pattern Recognition (ICPR), Stockholm, Sweden, Aug., 2014.*
74. Hoo, W.L., Kim, T-K., Pei, Y. and Chan, C.S. “Enhanced Random Forest with Image/Patch Level Learning for Image Understanding”, *IAPR International Conference on Pattern Recognition (ICPR), Stockholm, Sweden, Aug., 2014.*
75. Ahmadian, A., Chan, C.S., Salahshour, S. and Vembarasan, V. “FTFBE: A Numerical Approximation for Fuzzy Time-Fractional Bloch Equation”, *Proceedings of the IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Beijing, China, July, 2014.*
76. Hoo, W.L. and Chan, C.S. “Plsa-based Zero Shot Learning”, *Proceedings of the IEEE International Conference on Image Processing (ICIP), Melbourne, Australia, Sept., 2013.*

77. Lim, C.H. and Chan, C.S. “Fuzzy Action Recognition for Multiple Views within Single Camera”, *Proceedings of the IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Hyderabad, India, July, 2013.*
78. Vats, E., Jhavar, A., Tripathy, B.K., and Chan, C.S. “Generalised Approximate Equalities based on Rough Fuzzy Sets and Rough Measure of Fuzzy Sets”, *Proceedings of the IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Hyderabad, India, July, 2013.*
79. Lim, C.K. and Chan, C.S. “Inference Engine based on Interval Type-2 Fuzzy BK Subproduct”, *Proceedings of the IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Hyderabad, India, July, 2013.*
80. Tang, S.L. and Chan, C.S. “A Neighbourhood Search and Feedback for Coronary Artery Centerline Tracking”, *Proceedings of the IAPR Conference on Machine Vision Applications (MVA), Kyoto, Japan, May, 2013.*
81. Lim, M.K., Chan, C.S., Monekosso, D. and Remagnino, P. “SwATrack: A Swarm Intelligence-based Abrupt Motion Tracker”, *Proceedings of the IAPR Conference on Machine Vision Applications (MVA), Kyoto, Japan, May, 2013.*
82. Lim, C.K. and Chan, C.S. “Fuzzy Set and Multi Description Property” *Proceedings of the IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Brisbane, Australia, June, 2012, pp. 1-8.*
83. Lim, C.H. and Chan, C.S. “A Fuzzy Qualitative Approach for Scene Classification” *Proceedings of the IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Brisbane, Australia, June, 2012, pp. 1-8.*
84. Lam, M.C., Prabuwo, A.S., Arshad, H. and Chan, C.S. “A Real-Time Vision Based Framework for Human-Robot Interaction”, *Lecture Notes in Computer Science (LNCS), vol. 4066, Springer 2011, pp. 257-267.*  
**(Best Paper Award in IVIC-2011)**
85. Chan, C.S., Liu, H., and Lai, W.K. “Fuzzy Qualitative Complex Actions Recognition” *Proceedings of the IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Barcelona, Spain, June, 2011, pp. 1-8.*
86. Kiran, M., Teng, S.L., Chan, C.S. and Lai, W.K. “Human Posture Classification using Hybrid Particle Swarm Optimisation” *Proceedings of the 10<sup>th</sup> International Conference on Information Sciences, Signal Processing and their applications (ISSPA), Kuala Lumpur, Malaysia, 2010, pp. 778-781.*  
**(Best Paper Award)**
87. Hanapiah, F., Al-Obaidi, A. and Chan, C.S. “Anomaly Detection over Spatiotemporal Object Using Adaptive Piecewise Model” *Lecture Notes in Computer Science (LNCS), vol. 6230, Springer 2010, pp. 421-432.*
88. Shin, H. Reyes, N.H., Barczak, A. and Chan, C.S. “Colour Object Classification Using the Fusion of Visible and Near-Infrared Spectra” *Lecture Notes in Computer Science (LNCS), vol. 6230, Springer 2010, pp. 498-509.*

89. Chan, C.S. and Liu, H. "GMM-QNT Hybrid Framework for Vision based Human Motion Analysis" *Proceedings of the IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Jeju Island, Korea, 2009, pp. 1820-1825.*
90. Chan, C.S., Liu, H., Brown, D.J. and Kubota, N. "A Fuzzy Qualitative Approach to Human Motion Recognition" *Proceedings of the IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Hong Kong, June, 2008, pp. 1242-1249.*
91. Chan, C.S., Liu, H. and Brown, D.J. "An Effective Human Motion Classification Approach using Knowledge Representation in Qualitative Normalised Templates" *Proceedings of the IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), London, U.K., July 2007, pp. 1-6.*
92. Chan, C.S., Liu, H. and Brown, D.J. "Human Motion Classification using Qualitative Normalised Templates" *Proceedings of the 2006 UK Workshop on Computational Intelligence (UKCI), Leeds, U.K., 2006, pp. 127-134.*
93. Chan, C.S., Liu, H. and Brown, D.J. "Human Arm-Motion Classification using Qualitative Normalised Templates" *Lecture Notes in Computer Science (LNCS), vol. 4251 (Part I), Springer 2006, pp. 639-646.*  
**(Best Student Paper Award)**

## PROFESSIONAL SERVICES

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|------|--|
| 2022 | <p><b>Local arrangement chair</b>, 16<sup>th</sup> Asian Conference on Computer Vision (ACCV), Macau SAR, China</p> <p><b>Award chair</b>, International Symposium on Intelligence Signal Processing and Communication Systems (ISPACS), Penang, Malaysia</p>  |
| 2021 | <p><b>Brave new ideas chair</b>, ACM Multimedia Asia (ACM-MMAAsia), Gold Coast, Australia</p> <p><b>Competition organizer</b>, RRC-Integrated Circuit Text Spotting and Aesthetic Assessment, 16<sup>th</sup> International Conference on Document Analysis and Recognition (ICDAR), Lausanne, Switzerland</p> |
| 2020 | <p><b>General chair</b>, 13<sup>th</sup> International Conference on Intelligent Robotics and Applications (ICIRA), Kuala Lumpur, Malaysia</p>   |
| 2019 | <p><b>General chair</b>, IEEE 21<sup>st</sup> International Workshop on Multimedia Signal Processing (MMSP), Kuala Lumpur, Malaysia</p>  |
| 2018 | <p><b>Workshop organizer</b>, IEEE International Joint Conference on Artificial Intelligence (IJCAI), Stockholm, Sweden</p> <p><b>Guest Editor</b>, special issue on The Deep Learning in Computational Photography, Signal Processing: Image Communication (Elsevier)</p>                                     |

- 2017      **Finance co-chair**, 9<sup>th</sup> Asia-Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA), Malaysia  
**Co-Chair**, special session on Fuzzy Set Theory in Computer Vision, (FUZZ-IEEE), Italy  
**Guest Editor**, special issue on Feature and Deep Learning in Remote Sensing Applications, Journal of Applied Remote Sensing (JARS, SPIE)
- 2016      **Chapter Chair**, IEEE Computational Intelligence Society (IEEE-CIS), Malaysia  
**Honorary Treasurer**, Institute of Engineering and Technology, IET (Malaysia)  
**Regional Chair**, 7<sup>th</sup> International Conference on Imaging for Crime Detection and Prevention (ICDP), Spain  
**Publication Chair**, 8<sup>th</sup> Asia-Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA), Korea  
**Co-Chair**, special session on Fuzzy Set Theory in Computer Vision, (FUZZ-IEEE), Canada
- 2015      **Organizing Chair**, IAPR 3<sup>rd</sup> Asian Conference on Pattern Recognition, (ACPR), Malaysia  
**Honorary Treasurer**, Institute of Engineering and Technology, IET (Malaysia)  
**Chapter Chair**, IEEE Computational Intelligence Society (IEEE-CIS), Malaysia  
**Publicity Co-Chairs**, 19<sup>th</sup> Asia Pacific Symposium on Intelligent and Evolutionary Systems (IES), Thailand  
**Regional Chair**, 6<sup>th</sup> International Conference on Imaging for Crime Detection and Prevention (ICDP), UK  
**Co-Chair**, special session on Fuzzy Set Theory in Computer Vision, (FUZZ-IEEE), Turkey
- 2014      **Chapter Chair**, IEEE Computational Intelligence Society (IEEE-CIS), Malaysia  
**Symposium Chair**, INNS Symposium on Vision and Image Processing (SoVIP), Brunei  
**Publication Chair**, 22<sup>nd</sup> International Symposium on Intelligent Signal Processing and Communication Systems (ISPACS), Malaysia  
**Co-Chair**, special session on Cognitive Science and Computational Intelligence (APSIPA), Cambodia  
**Co-Chair**, special session on Fuzzy Set Theory in Computer Vision, (FUZZ-IEEE), China  
**Guest Editor**, special issue on Visual Communication and Image Processing, Signal, Image and Video Processing (SIViP, Springer)
- 2013      **General Chair**, IEEE Conference on Visual Communication and Image Processing (VCIP), Malaysia  
**Guest Editor**, special issue on New Trend of Computational Intelligence in Human-Robot Interaction, Information Sciences (INS, Elsevier)

- Co-Chair**, special session on Computational Intelligence for Cognitive Robotics (FUZZ-IEEE), India  
**Regional Chair**, 5<sup>th</sup> International Conference on Imaging for Crime Detection and Prevention (ICDP), UK
- 2012      **Symposium Chair**, INNS (Thailand)
- 2011      **Co-Chair**, special session on Fuzzy Robotics (FUZZ-IEEE), Taiwan
- 2010      **Guest Editor**, special issue on Recent Advances in Fuzzy Qualitative Reasoning, International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems (IJUFKS, World Scientific)
- Associate Editor, Pattern Recognition (Elsevier) since 2021
  - Associate Editor, IEEE/CAA Journal of Automatica Sinica since 2018
  - Chartered Engineer, CEng U.K. since 2015.
  - Board of Governors (Malaysia representative), International Association on Pattern Recognition (IAPR) since 2014.
  - IEEE Senior Member, SMIEEE since 2013.

## HONORS AND AWARDS

- 2022      **Top Research Scientists Malaysia**, Academy of Sciences Malaysia
- 2021      **Best Student Paper Award**, MIUA2021, Oxford, U.K.
- 2017      **Excellence Service Award**, University of Malaya, Malaysia
- 2016      **Silver Medal (Invention & Innovation Awards)**, Malaysia Technology Expo, Kuala Lumpur, Malaysia
- 2015      **Member**, Young Scientist Network – Academy of Sciences Malaysia  
**Chartered Engineer**, Institute of Engineering and Technology, U.K.  
**Best Student Paper Nomination Award**, FUZZ-IEEE 2015, Istanbul, Turkey
- 2014      **Visiting Associate Professor**, Tokyo Metropolitan University, Japan  
**Visiting Researcher**, University of Reading, U.K.
- 2013      **Hitachi Fellowship**, Hitachi, Japan
- 2011      **Best Paper Award**, IVIC2011, Kuala Lumpur, Malaysia
- 2010      **IET Young Engineer Award**, Malaysia  
**Best Paper Award**, ISSPA2010, Kuala Lumpur, Malaysia
- 2006      **Best Student Paper Award**, KES2006, Bournemouth, U.K.  
**British Top 100's Early Stage Research Engineer**, U.K.

## TEACHING EXPERIENCE

- Universiti Malaya – Faculty of Comp. Sci. and Info. Tech.
  - *Computer System and Organisation*, Sem I 2016, 2017 [graduate course]
  - *Computer Vision and Pattern Recognition*, Sem II 2015, 2016, 2017, 2018 [postgraduate]
  - *Data Structure*, Sem II 2019, 2020 [graduate course]
  - *Fuzzy Logic*, Sem I 2011, 2012, 2013, 2014, 2015, 2016, 2017 [graduate course]
  - *Image Processing*, Sem II 2012, 2013, 2014, 2019, 2020, 2022 [graduate course]
  - *Machine Learning*, Sem I, 2012, 2022 [graduate course]
  - *Neural Network*, Sem II 2011, 2020 [graduate course]

## ADVISING *(only as Main Supervisor are listed)*

- Current graduate students
  - Ying Hua Tan - Ph.D.
  - Jian Han Lim – Ph.D.
  - Chun Chet Ng - Ph.D.
  - Soon Chang Poh - Ph.D.
  - Gen Bing Liong - Ph.D.
  - Shin Wei Lim - Masters
- Former students
  - Yang Loong Chang - Ph.D. (2022)
  - Pang Ting - Ph.D. (2022)
  - Hamizah Miswan - Ph.D. (2022)
  - Nurul Japar - Ph.D. (2022)
  - Jia Huei Tan - Ph.D. (2022)
  - Jessica Wong - Ph.D. (2021)
  - Chee Kheng Chng – Masters (2019)
  - Yuen Peng Loh - Ph.D. (2019)
  - Sue Han Lee - Ph.D. (2018)
  - Ven Jyn Kok - Ph.D. (2016)
  - Ekta Vats - Ph.D. (2016)
  - Sze Ling Tan - Ph.D. (2015)
  - Anhar Risnumawan – Masters (2015)
  - Mei Kuan Lim - Ph.D. (2015)
  - Chern Hong Lim - Ph.D. (2015)
  - Wai Lam Hoo - Ph.D. (2015)
  - Chee Kau Lim - Ph.D. (2015)
  - Ishan Abeywardena – Ph.D. (2015)
  - Wei Ren Tan – Masters (2012)

## SEMINAR SERIES AND INVITED TALKS

- |      |   |
|------|---|
| 2018 | <b>Tutorial Speaker</b> , IEEE International Joint Conference on Artificial Intelligence (IJCAI), Stockholm, Sweden   |
| 2017 | <b>Tutorial Speaker</b> , IEEE International Conference on Fuzzy Systems, Naples, Italy   |
| 2016 | <b>TEDx Speaker</b> , Malaysia<br><b>Invited Speaker</b> , Kyoto University, Japan<br><b>Tutorial Speaker</b> , World Congress on Computational Intelligence, Vancouver, Canada |

- 2015 **Invited Speaker**, National University of Malaysia, Malaysia  
**Tutorial Speaker**, IEEE International Conference on Fuzzy Systems,  
Istanbul, Turkey
- 2014 **Invited Speaker**, National Laboratory of Pattern Recognition (NLPR),  
Chinese Academic of Science, PR China  
**Invited Speaker**, The International Workshop on Advanced  
Computational Intelligence and Intelligent Informatics, Japan
- 2013 **Keynote Speaker**, Int. Seminar on Computer Vision, India  
**Invited Workshop Speaker**, Health Informatics Research Workshop:  
Towards Sustainable Healthcare, Swinburne University of Technology,  
Sarawak Campus, Malaysia
- 2012 **Invited Speaker**, IET AGM (Malaysia Chapter)
- 2010 **Invited Speaker**, iFAN2010, Tokyo, Japan  
**Invited Speaker**, Phillips Research Centre, Eindhoven, Netherlands

### **REFERENCE UPON REQUEST**