

CURRICULUM VITAE



PERSONAL DETAILS

Name	: Assoc. Prof. Ts. Dr. Mas Rina Mustaffa
Address	: Multimedia Department, Faculty of Computer Science and Information Technology, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor Darul Ehsan, Malaysia.
Field of Specialisation	: Multimedia Retrieval, Computer Vision, Intelligent Systems, Multimedia Computing, Digital Image Processing, Pattern Recognition
E-mail	: MasRina@upm.edu.my

EMPLOYMENT EXPERIENCE

July 2022 – February 2024	: Head Multimedia Department, Faculty of Computer Science and Information Technology, Universiti Putra Malaysia
July 2021 – July 2022	: Head Multimedia Department, Faculty of Computer Science and Information Technology, Universiti Putra Malaysia
February 2020 - present	: Associate Professor Multimedia Department, Faculty of Computer Science and Information Technology, Universiti Putra Malaysia
March 2012 – January 2020	: Senior Lecturer Multimedia Department, Faculty of Computer Science and Information Technology, Universiti Putra Malaysia

Aug 2003 – March 2012	:	Tutor Multimedia Department, Faculty of Computer Science and Information Technology, Universiti Putra Malaysia
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EDUCATION BACKGROUND

Year	Degree	Institution
2012	PhD (Multimedia Systems)	Universiti Putra Malaysia
2006	MSc (Multimedia Systems)	Universiti Putra Malaysia
2003	BCompSc (Multimedia)	Universiti Putra Malaysia

TEACHING EXPERIENCE

MASTER / PHD LEVEL

- Advanced Multimedia Information Retrieval (SKM5306)
- Directed Reading in Computer Science (SSK5200)
- Selected Topics in Multimedia (SKM5800)

Total Teaching Hours: 9

BACHELOR LEVEL

- Artificial Intelligence (CSC3600)
- Data Structure and Algorithms (CCS3202)
- Database Principles (CCS3400)
- Database Principles (CSC3400)
- Database Application Development (SSK3408)
- Digital Image Processing (SKM4213)
- Introduction to Multimedia (SKM2300)
- Multimedia Information Retrieval (SKM4301)
- Multimedia Information Retrieval (SKM4315)
- Multimedia Technology (SKM3001)
- Multimedia Technology (SKM3011)
- Pattern Recognition (SKM4206)
- Pattern Recognition (SKM4214)

Total Teaching Hours: 166

DIPLOMA LEVEL

- Basics of Multimedia Technology (during Tutor years)

STUDENT SUPERVISION EXPERIENCE

POSTGRADUATE STUDENTS

Main Supervisor

- 1 PhD (graduated), 4 PhD (on-going)
- 1 MSc (graduated)
- 1 Masters by Course Work (graduated)

Co-supervisor

- 4 PhD (graduated), 5 PhD (on-going), 4 PhD (Outside UPM-on-going)
- 2 MSc (graduated), 0 MSc (on-going)

UNDERGRADUATE STUDENTS (AS MAIN SUPERVISOR)

- 41 students graduated, 5 on-going

PUBLICATIONS

Google Scholar *h*-index: 8

Scopus *h*-index: 7

CITATION INDEXED JOURNAL (CIJ)

1. Mustaffa, M. R., Osman, N. S., Doraisamy, S., & Madzin, H. (2025). Fish image analysis: Fusion of moment-based and directional features in colour space. *Malaysian Journal of Computer Science*, 38.
2. Radman, A., Mustaffa, M. R., Rahmat, R. W., Abdul Halin, A., & Ahmed, I. (2025). 3D face shape generation using 3D triangle coordinates and multi-stereo vision. *Journal of Xidian University*, 19(7), 632-650.
3. Radman, A., Mustaffa, M. R., Rahmat, R. W., Abdul Halin, A., & Ahmed, I. (2025). 3D triangle coordinates for robust pixel calibration in multi-stereo vision. *High Technology Letters*, 31(7), 122-131.
4. Al-Qaisieh, M. S. A. & Mustaffa, M. R. (2025). Self-supervised learning for action recognition: Trends, models, and applications. *Journal of Information Systems Engineering and Management*, 10(48s), 1183-1198.
5. Khalid F. B., Singh, R. R., Shaffer, N. A., Ahlawat, T. R., Sankar, M., Arawal, A., ... & Mustaffa, M. R. (2025). Efficient deep learning with compressed muzzle prints

- for scalable buffalo identification. *Journal of Theoretical and Applied Information Technology*, 103(24).
6. Han, Z., Azman, A., Khalid, F., & **Mustaffa, M. R.** (2024). Multi-granularity semantic information integration graph for cross-modal hash retrieval. *IEEE Access*, 12, 44682-44694.
 7. Han, Z., Azman, A., **Mustaffa, M. R.**, & Khalid, F. (2024). Cross-modal retrieval: A review of methodologies, datasets, and future perspectives. *IEEE Access*, 12, 115716-115741.
 8. Liu, X., Abdullah, M. T., **Mustaffa, M. R.**, & Nasharuddin, N. A. (2024). Individual-Tree Segmentation and Extraction based on LiDAR Point Cloud Data. *International Journal on Advanced Science, Engineering & Information Technology*, 14(5).
 9. **Mustaffa, M. R.**, Idris, A. A., Abdullah, L. N., & Nasharuddin, N. A. (2023). Deep learning mango fruits recognition based on tensor flow lite. *International Journal of Advances in Intelligent Informatics*, 9(3), 565-576.
 10. Al-rababah, K., **Mustaffa, M. R.**, Doraisamy, S., Khalid, F., & Luís Filipe de Pina Júnior (2021). Hybrid discrete wavelet transform and texture analysis methods for feature extraction and classification of breast dynamic thermogram sequences. *Malaysian Journal of Computer Science (MJCS)*, 116-131.
 11. **Mustaffa, M. R.**, Mohd Norowi, N., & Sim, M. Y. (2020). Content-based feature fusion representation for marine invertebrates. *Malaysian Journal of Computer Science (MJCS)*, 33(3), 170-187.
 12. **Mustaffa, M. R.**, Nachiappan, I. N., Abdullah, L. N., Khalid, F., & Hussin, M. (2020). Grain recognition based on colour and shape analysis. *International Journal of Advanced Science and Technology (IJAST)*, 29 (6s), 1512-1522.
 13. **Mustaffa, M. R.**, Ong, S. F., Mohd Norowi, N., & Hussin, M. (2020). Outfit classification and recommendation based on integrated features and bagged decision tree. *International Journal of Advanced Research in Engineering and Technology (IJARET)*, 11(12), 1400-1409.
 14. Chen, W. C., Mohd Norowi, N., Doraisamy, S., & **Mustaffa, M. R.** (2020). Understanding the requirements of runners to design a virtual group running system. *International Journal of Advanced Research in Engineering and Technology (IJARET)*, 11(12), 1304-1314.

15. Samual, J., Hussin, M., Hamid, N. A. W. A., **Mustaffa, M. R.**, & Abdullah, A. (2020). Awareness of energy consumption in cloud data centers: A survey on employee engagement in energy management. *Journal of Critical Reviews*, 7(8), 1295-1301.
16. **Mustaffa, M. R.**, Loh, W. Y., Abdullah, L. N., & Nasharuddin, N. A. (2019). A colour-based building recognition using support vector machine. *Telecommunication, Computing, Electronics and Control (TELKOMNIKA)*, 17(1), 473-480.
17. **Mustaffa, M. R.**, Nasharuddin, N. A., Hussin, M., Mohd Nazri, N. I. N., Zakaria, A. H., & Nik Ahmad Zamri, N. N. E. A. (2019). Automated recyclable waste classification using multiple shape-based properties and quadratic discriminant. *International Journal of Innovative Technology and Exploring Engineering (IJITEE)*, 8, 270-274.
18. Shaharom, N. D. S, **Mustaffa, M. R.**, Abdullah, L. N., & Khalid, F. (2019). Durian species recognition based on fast discrete curvelet transform and k-nearest neighbour. *International Journal of Advanced Trends in Computer Science and Engineering (IJATCSE)*, 8 (1.4), 323-331.
19. Osman, N. S., **Mustaffa, M. R.**, Doraisamy, S. C., & Madzin, H. (2019). Content-based image retrieval for fish based on extended Zernike moments-local directional pattern-hue colour space. *International Journal of Innovative Technology and Exploring Engineering (IJITEE)*, 8, 173-183.
20. Hussin, M., Mahmood, R. A. R., & **Mustaffa, M. R.** (2019). Sensor communication model using cyber-physical system approach for green data center. *International Journal of Interactive Mobile Technologies (IJIM)*, 13(10), 188-197.
21. **Mustaffa, M. R.**, Nyon, X. Y., Abdullah, L. N., & Nasharuddin, N. A. (2018). Durian recognition based on multiple features and linear discriminant analysis. *Malaysian Journal of Computer Science (MJCS)*, 57-72.
22. Mohd Hamran, N. F., **Mustaffa, M. R.**, & Doraisamy, S. (2018). Content-based representation for moth recognition and retrieval: A review. *International Journal of Engineering & Technology (IJET)*, 7(4.38) (2018), 1493 – 1495.
23. Kamal Ariffin, N. I., **Mustaffa, M. R.**, Abdullah, L. N., & Nasharuddin, N. A. (2018). Fruits recognition based on texture features and k-nearest neighbour. *International Journal of Engineering & Technology (IJET)*, 7(4.31) (2018), 452-4580.
24. Mansourian, L., Abdullah, M. T., Abdullah, L. N., Azman, A., & **Mustaffa, M. R.** (2018). An effective fusion model for image retrieval. *Multimedia Tools and Applications*, 77(13), 16131-16154.

25. Abd Razak, N. A., Madzin, H., Khalid, F., & **Mustaffa, M. R.** (2018). Speckle filtering method in the gonad ultrasound image for mahseer's fish (*tor tombroides*). *International Journal of Engineering & Technology (IJET)*, 7(4.31) (2018), 15-19.
26. **Mustaffa, M. R.**, Ahmad, F., & Doraisamy, S. (2017). Multi-resolution joint auto correlograms for content-based image retrieval. *Advanced Science Letters*, 23(6), 5370-5374.
27. **Mustaffa, M. R.**, Azman, A., & Kunesegeran, G. (2017). Content-based image retrieval using colour models and linear discriminant analysis. *Advanced Science Letters*, 23(6), 5387-5390.
28. **Mustaffa, M. R.** & Mansor, E. I. (2017). Vid2U: Facilitating students' learning through video annotation for tablet device. *Advanced Science Letters*, 23(6), 5375-5378.
29. Zand, M., Doraisamy, S., Halin, A. A., & **Mustaffa, M. R.** (2017). Visual and semantic context modelling for scene-centric image annotation. *Multimedia Tools and Applications*, 76(6), 8547-8571.
30. Mansourian, L., Abdullah, M. T., Abdullah, L. N., Azman, A., & **Mustaffa, M. R.** (2016). A salient based bag of visual word model (SBBBoVW): Improvements toward difficult object recognition and object location in image retrieval. *KSII Transactions on Internet & Information Systems*, 10(2), 769-786.
31. Zand, M., Doraisamy, S., Halin, A. A., & **Mustaffa, M. R.** (2016). Ontology-based semantic image segmentation using mixture models and multiple CRFs. *IEEE Transactions on Image Processing*, 25(7), 3233-3248.
32. Zand, M., Doraisamy, S., Halin, A. A., & **Mustaffa, M. R.** (2015). Texture classification and discrimination for region-based image retrieval. *Journal of Visual Communication and Image Representation*, 26(January 2015), 305-316.
33. **Mustaffa, M. R.**, Ahmad, F., & Doraisamy, S. (2014). Multi-resolution shape-based image retrieval using Ridgelet transform. In Jaafar, A., Mohamad Ali, N., Mohd Noah, S. A., Smeaton, A. F., Bruza, P., Abu Bakar, Z., Jamil, N., & Tengku Sembok, T. M. (Eds.). *Information Retrieval Technology* (pp. 112-123). Heidelberg: Springer International Publishing.
34. **Mustaffa, M. R.**, Ahmad, F., Mahmod, R., & Doraisamy, S. (2013). Content-based image retrieval using colour and shape fused features. *Pertanika Journal of Science & Technology*, 21(1), 161-168.

35. **Mustaffa, M. R.**, Ahmad. F., Rahmat, R. W., & Mahmod, R. (2008). Content-based image retrieval based on colour-spatial features. *Malaysian Journal of Computer Science*, 21(1), 1-12.

NON-CITATION INDEXED JOURNAL (NON CIJ)

1. Mukanova, T., Temirkhanova, M., & **Mustaffa, M. R.** (2025). Education digitalization: Impact on the learning quality and the participants' readiness in the educational process. *International Journal of Education and Digital Pedagogy*, (1), 64-82.
2. Nurzhanova, A., Mussabek, M., Ince, G., **Mustaffa, M. R.**, & Zhumadillayeva, A. (2025). Detection of mental disorders based on the analysis of emotion, facial expressions and facial movements in a video stream. *Journal of Problems in Computer Science and Information Technologies*, 3(3), 68-78.
3. Hussin, M., Said, M. S., Mohd. Norowi, N., Husin, N. A., & **Mustaffa, M. R.** (2021). Authentic assessment for affective domain through student participant in community services, *Asia-Pacific Journal of Information Technology and Multimedia*, 10(1), 52-62.
4. Albahari, E., Madzin, H., Rahmat, R. W. O., **Mustaffa, M. R.**, & Noor, M. R. M. (2020). Lab image and field image contrast quality differentiation, *International Journal of Innovative Technology and Exploring Engineering (IJITEE)*, 9(3), 3428-3131.
5. Hussin, M., Mahmood, R. R., & **Mustaffa, M. R.** (2019). Sensor Communication Model Using Cyber-Physical System Approach for Green Data Center.
6. Abd Razak, N. A., Madzin, H., Khalid, F., & **Mustaffa, M. R.** (2018). Morphological operation method for eggs identification in gonad ultrasound image for mahseer's fish (tor tombroides). *Advanced Science Letters*, 24(3), 1829-1833.
7. Madzin, H., Abd Razak, N. A., **Mustaffa, M. R.**, & Khalid, F. (2018). Evaluation of morphological operation structure elements for eggs identification in gonad ultrasound image. *Journal of Advanced Computer Science and Technology Research*, 8(3), 94-101.
8. Abd Razak, N. A., Madzin, H., Khalid, F., & **Mustaffa, M. R.** (2017). Gonad ultrasonography image pre-processing for Mahseer (Tor Tombroides). *Journal of FisheriesSciences.com*, 11(3), 026-035.

9. **Mustaffa, M. R.** & Mansor, E. I. (2015). Facilitating students' learning through m-lms for tablet device. *International Journal of Computer Theory and Engineering*, 7(3), 236-240.

BOOK CHAPTER

1. **Mustaffa, M. R.**, Mohd. Norowi, N., & Nasharuddin, N. A. (2019). Throne of Thorns. In Qamaruz Zaman, F. & Abdul Razak, M. (Eds.). *Nature's Yield and Wonders of Art (NYAWA) 19: Food* (pp. 62-63). Serdang: Universiti Putra Malaysia Press.
2. Syed Ismail, S. N., Abdul Rahman, U. R., Sarva Mangala, P., Zainal Abidin E., Rasdi, I., & **Mustaffa, M. R.** (2018). Mobile applications for education: student perceptions of an undergraduate course. In Wong, S. L. & Mohd Kasim, Z. (Eds). *Trends & Issues in Higher Education* (pp. 14-26). Serdang: Centre for Academic Development (CADe), Universiti Putra Malaysia.
3. Mansourian, L., Abdullah, M. T., Abdullah, L. N., Azman, A., & **Mustaffa, M. R.** (2016). BoVW model for animal recognition: An evaluation on SIFT feature strategies. In Badioze Zaman, H., Robinson, P., Smeaton, A. F., Shih, T. K., Velastin, S., Jaafar, A., & Mohamad Ali, N. (Eds.). *Advances in Visual Informatics* (pp. 227-236). Heidelberg: Springer International Publishing.
4. **Mustaffa, M. R.**, Ahmad, F., & Rahmat, R. W. (2005). Region-based image retrieval using modified dominant colour region technique. In Ahmad, F., Mahmood, R., Rahmat, R. W., & Doraisamy, S. (Eds.) *Multimedia Departmental Seminar Notes Series 2004/05* (pp. 57-60). Serdang: Penerbit UPM.

PROCEEDING

1. Han, Z., Azman, A., **Mustaffa, M. R.**, & Khalid, F. (2025, July). CLIP-Driven Deep Hashing for Cross-Modal Retrieval. In *International Conference on Applications of Natural Language to Information Systems* (pp. 173-185). Cham: Springer Nature Switzerland.
2. **Mustaffa, M. R.**, & Alsulaimani, M. A. (2025, June). Facial Emotion Recognition for Online Classrooms Using Lightweight Transfer Learning. In *2025 3rd International Conference on Inventive Computing and Informatics (ICICI)* (pp. 706-711). IEEE.
3. Liu, Y., Khalid, F., Wang, C., **Mustaffa, M. R.**, & Azman, A. (2025, April). DiffVecFont: Fusing Dual-Mode Reconstruction Vector Fonts via Masked Diffusion

- Transformers. In *International Conference on Computational Visual Media* (pp. 339-363). Singapore: Springer Nature Singapore.
4. **Mustaffa, M. R.**, Osman, N. S., Doraisamy, S. C., & Madzin, H. (2024, November). An Enhanced Method for Content-Based Underwater Fish Image Retrieval Using Hybrid Features. In *2024 16th International Conference on Knowledge and System Engineering (KSE)* (pp. 237-242). IEEE.
 5. **Mustaffa, M. R.**, & Rizal, N. S. N. (2024, November). IoT-Based Monitoring of Chili Plant Growth. In *2024 6th International Conference on Cybernetics and Intelligent System (ICORIS)* (pp. 1-6). IEEE.
 6. Han, Z., Azman, A., Khalid, F., & **Mustaffa, M. R.** (2024, August). Multi-view Correlation Learning Cross-Modal Retrieval Based on Multi-layer Attention. In *International Conference on Guidance, Navigation and Control* (pp. 476-486). Singapore: Springer Nature Singapore.
 7. Iqbal, M. I., **Mustaffa, M. R.**, Khalid, F., & Azman, A. (2024). Application of deep learning techniques to detect plant diseases: A survey of scholarly works. *Proceedings of the 7th International Conference on Recent Trends in Advanced Computing (ICRTAC'24)*, 14-15 November 2024, Tamil Nadu, India (hybrid). Springer. (Accepted)
 8. **Mustaffa, M. R.**, Osman, N. S., Doraisamy, S. C., & Madzin, H. (2024). An enhanced method for content-based underwater fish image retrieval using hybrid features. *Proceedings of the 2024 16th International Conference on Knowledge and Systems Engineering (KSE 2024)*, 5-7 November 2024, Kuala Lumpur, Malaysia. (pp. 237-242). IEEE.
 9. **Mustaffa, M. R.** & Ang, G. Z. (2023). Region-based Convolutional Neural Network and Tesseract Optical Character Recognition for recognising Entity Relationship Diagram. *Proceedings of the 2023 10th Electrical Engineering, Computer Science, and Informatics Conference (EECSI 2023)*, 20-21 September 2023, Palembang, Indonesia. (pp. 237-241). IEEE.
 10. Al-rababah, K., **Mustaffa, M. R.**, Doraisamy, S., & Khalid, F. (2021). Hybrid discrete wavelet transform and histogram of oriented gradients for feature extraction and classification of breast dynamic thermogram sequences. *Proceedings of the 2021 Fifth International Conference on Information Retrieval and Knowledge Management (CAMP'21)*, 15-17 June 2021, online. (pp. 31-35). IEEE.

11. **Mustaffa, M. R.**, Goh, S. W., Abdullah, L. N., & Nasharuddin, N. A. (2019). Dress me up!: Content-based clothing image retrieval. *Proceedings of the 3rd International Conference on Cryptography, Security and Privacy and 4th International Conference on Multimedia and Image Processing (ICMIP 2019)*, 19-21 January 2019, Kuala Lumpur, Malaysia. (pp. 206-210). ACM. (**Best Presentation Award**).
12. Chen, W. C., Mohd Norowi, N., Doraisamy, S. C., & **Mustaffa, M. R.** (2019, April). Interactive musical songs recommendation using 3D coordinates model. *Proceedings of the 5th International ACM In-Cooperation HCI and UX Conference*, 1-9 April 2019, Indonesia (pp. 78-87). ACM.
13. Nyon, X. Y., **Mustaffa, M. R.**, Abdullah, L. N., & Nasharuddin, N. A. (2018). Durian species recognition system based on global shape representations and k-nearest neighbours. *Proceedings of the 2018 Fourth International Conference on Information Retrieval and Knowledge Management (CAMP'18)*, 26-28 March 2018, Kota Kinabalu, Malaysia (pp. 79-84). IEEE.
14. Al-Rababah, K., Doraisamy, S. C., Khalid, F., & **Mustaffa, M. R.** (2018). A colour-based high temperature extraction method in breast thermogram to classify cancerous and healthy cases using SVM. *Proceedings of the 2nd International Conference on Imaging, Signal Processing, and Communication (ICISPC 2018)*, 20-22 July 2018, Kuala Lumpur, Malaysia (pp. 70-73). IEEE.
15. Mansourian, L., Abdullah, M. T., Abdullah, L. N., Azman, A., & **Mustaffa, M. R.** (2017). An effective image classification method with the fusion of invariant feature and a new colour descriptor. *Proceedings of the 8th International Conference on Graphic and Image Processing (ICGIP 2016)*, 29-31 October 2016, Tokyo, Japan (pp. 102250Z 1-5). SPIE.
16. **Mustaffa, M. R.** & Wong, S. S. (2017). Content-based fauna image retrieval system. *Proceedings of the 2017 IEEE International Conference on Signal and Image Processing Applications (IEEE ICSIPA 2017)*, 12-14 September 2017, The Waterfront Hotel, Kuching, Sarawak, Malaysia (pp. 139-144). IEEE.
17. **Mustaffa, M. R.**, Mohd. Norowi, N, & Sim, M. Y. (2016). Content-based image retrieval system for marine invertebrates. *Proceedings of the Third International Conference on Information Retrieval and Knowledge Management (CAMP'16)*, 23-24 August 2016, Hatten Hotel Melaka, Malaysia (pp. 71-76). IEEE. (**Best Paper Award**).

18. Mohd. Norowi, N. & **Mustaffa, M. R.** (2016). Using concatenation cost for unit selection of homosonic segments in concatenative sound synthesis. *Proceedings of the Third International Conference on Information Retrieval and Knowledge Management (CAMP'16)*, 23-24 August 2016, Hatten Hotel Melaka, Malaysia (pp. 37-42). IEEE.
19. Osman, N. S. & **Mustaffa, M. R.** (2015). A review on content-based image retrieval representation and description for fish. *Proceedings of the 2015 4th International Conference on Advanced Computer Science Applications and Technologies (ACSAT 2015)*, 8-10 December 2015, Kuala Lumpur, Malaysia (pp. 39-44). IEEE.
20. Zand, M., Doraisamy, S., Halin, A. A., & **Mustaffa, M. R.** (2015). Automatic object segmentation using perceptual grouping of regions with contextual constraints. *Proceedings of the 2015 International Conference on Image Processing Theory, Tools, and Applications (IPTA)*, 10-13 November 2015, Orleans, France (pp. 530-534). IEEE.
21. Mansourian, L., Abdullah, M. T., Abdullah, L. N., Azman, A., & **Mustaffa, M. R.** (2015, October). BoVW model for animal recognition: An evaluation on SIFT feature strategies. In *International Visual Informatics Conference* (pp. 227-236). Cham: Springer International Publishing.
22. **Mustaffa, M. R.**, Ahmad, F., Mahmod, R., & Doraisamy, S. (2012). Multi-resolution joint auto correlograms: Determining the distance function. In Mahmod, R., Abdullah, R., Abdullah, L. N., Tengku Sembok, T. M., Smeaton, A. F., Crestani, F., Doraisamy, S., Abdul Kadir, R., & Ismail, M. (Eds.) *Proceedings of the International Conference on Information Retrieval and Knowledge Management (CAMP 2012)*, 13-15 March 2012, Mines Wellness Hotel, Selangor, Malaysia (pp. 198-202). IEEE.
23. **Mustaffa, M. R.**, Ahmad, F., Mahmod, R., & Doraisamy, S. (2010). Invariant generalised Ridgelet-Fourier for shape-based image retrieval. In Abu Bakar, Z., Tengku Sembok, T. M., Badioze Zaman, H., Bruza, P., Crestani, F., Shalini, R., & Awang, Z. (Eds.) *Proceedings of the International Conference on Information Retrieval and Knowledge Management (CAMP 2010)*, 17-18 March 2010, Shah Alam Convention Centre, Shah Alam, Selangor, Malaysia (pp. 79-84). IEEE. (**Best Paper Award**).
24. **Mustaffa, M. R.**, Ahmad, F., Mahmod, R., & Doraisamy, S. (2010). Shape descriptor based on invariant generalised Ridgelet transform for $m \times n$ images. In Zagar, B., Kuijper, A., & Sahbi, H. (Eds.) *Proceedings of the Seventh IASTED*

International Conference on Signal Processing, Pattern Recognition, and Applications (SPPRA 2010), 17-19 February 2010, Innsbruck, Austria (pp. 138-145). Acta Press.

25. **Mustaffa, M. R.**, Ahmad, F., Mahmod, R., & Doraisamy, S. (2009). Generalised Ridgelet-Fourier for $m \times n$ images: Determining the normalisation criteria. In Low, S. M. (Ed.) *Proceedings of the IEEE International Conference on Signal and Image Processing Applications (ICSIPA 2009)*, 18-19 November 2009, Cititel Mid Valley Hotel, Kuala Lumpur, Malaysia (pp. 380-384). IEEE.
26. **Mustaffa, M. R.**, Ahmad, F., Rahmat, R. W., & Mahmod, R. (2008). Dominant colour descriptor with spatial information for content-based image retrieval. In *Proceedings of the International Symposium on Information Technology 2008 (ITSIM '08)*, 26-29 August 2008, Kuala Lumpur Convention Centre, Kuala Lumpur, Malaysia (pp. 1612-1620).
27. **Mustaffa, M. R.** & Ahmad, F. (2008). A comparative study of shape descriptors for content-based image retrieval. In *Proceedings of the National Conference on Information Retrieval and Knowledge Management (CAMP 2008)*, 18 March 2008, Mines Palace Beach and Spa, Kuala Lumpur, Malaysia (pp. 140-145).
28. **Mustaffa, M. R.**, Ahmad, F., Rahmat, R. W., & Mahmod, R. (2007). An integrated colour-spatial approach for content-based image retrieval. In *Proceedings of the 2007 International Conference on Multimedia Systems and Applications (MSA '07)*, 25-28 June 2007, Las Vegas, Nevada, USA (pp. 23-29).
29. **Mustaffa, M. R.**, Ahmad, F., Rahmat, R. W., & Mahmod, R. (2006). Content-based image retrieval using integrated colour-spatial approach. In *Proceedings of the Regional Computer Science Postgraduate Conference 2006 (ReCSPC '06)*, 27-28 June 2006, Pulau Pinang, Malaysia (pp. 210-215).
30. **Mustaffa, M. R.**, Ahmad, F., & Rahmat, R. W. (2005). Region-based image retrieval using modified sub-block technique. In *Proceedings of the National Computer Science Postgraduate Colloquium 2005 (NaCSPC '05)*, 27-28 June 2005, Pulau Pinang, Malaysia.
31. **Mustaffa, M. R.** & Ahmad, F. (2004). A review of content-based image retrieval techniques. In *Proceedings of the Information Technology Colloquium 2004 (INTEC '04)*, 1 June 2004, Serdang, Selangor, Malaysia.

EXHIBITION

1. Abdul Wahab, N. A. D. & **Mustaffa, M. R.** (2025). Digital fabric visualisation for Malaysian traditional attire using AI-enhanced mobile application, poster presented at the Putra InnoCreative Poster Competition, 7th International Putra InnoCreative Carnival in Teaching and Learning 2025 (I-PICTL 2025) X SULAM@UPM Carnival 2025 organised by Centre for Academic Development and Leadership Excellence (CADe-Lead), UPM, 16-17 June 2025 (**Silver Medal**).
2. Md Ishtiaq, I., **Mustaffa, M. R.**, Khalid, F., & Azman, A. (2024). Cultivating resilience: YOLOv7 and cutting-edge deep learning approaches for accurate plant disease identification in elevating agricultural efficiency, research showcase organised by Faculty of Computer Science and Information Technology, UPM, 19 March 2024.
3. **Mustaffa, M. R.**, Al-Rababah, K., Doraisamy, S., & Khalid, F. (2023). Hybrid discrete wavelet transform and texture analysis methods for feature extraction and classification of breast dynamic thermogram sequences, research showcase in conjunction with FCSIT Open Day 2023 organised by Faculty of Computer Science and Information Technology, UPM, 23 – 26 October 2023.
4. **Mustaffa, M. R.** & Ang, G. Z. (2023). Automatic entity relationship diagram detection and recognition for assisting teaching and learning in database course, poster presented at the International Putra InnoCreative Poster Competition, International Putra InnoCreative Carnival in Teaching and Learning 2023 (*PicTL 2023*) organised by Centre for Academic Development and Leadership Excellence (CADe-Lead), UPM, 14 – 16 November 2023 (**Gold Medal**).
5. Albahari, E., Madzin, H., Rahmat, R. W., & **Mustaffa, M. R.** (2020). Global and local descriptors in triplet fusion method for field image enhancement, MARDI Science & Technology Exhibition 2020, organised by MARDI, 10–12 November 2020 (**Gold Medal**).
6. **Mustaffa, M. R.**, Shaharom, N. D. S, Mohd Norowi, N., & Nasharuddin, N. A. (2020). Learning about durian varieties through recognition app., poster presented at the International Putra InnoCreative Poster Competition, International Putra InnoCreative Carnival in Teaching and Learning 2020 (*PicTL 2020*) organised by Centre for Academic Development (CADe), UPM, 22 – 30 October 2020 (**Gold Medal**).

7. **Mustaffa, M. R.**, Mohd. Norowi, N., & Nasharuddin, N. A. (2019). Throne of Thorns, research artefact presented at the Nature's Yield and Wonders of Art (NYAWA) 2019, 23 September – 31 December 2019, Universiti Putra Malaysia, Selangor, Malaysia.
8. Abdullah, L. N. & **Mustaffa, M. R.** (2019). Visualisation effects of subjective extracted text using parse tree for English learning, poster presented at the 2019 *Putra InnoCreative Carnival in Teaching and Learning (PicTL' 19)* organised by Centre for Academic Development (CADe), Universiti Putra Malaysia, 16–17 October 2019, Universiti Putra Malaysia, Selangor, Malaysia (**Silver Medal**).
9. **Mustaffa, M. R.**, Abdullah, L. N., & Nasharuddin, N. A. (2018). LaMarlImE: Learning about marine invertebrates through image example, poster presented at the 2018 *Putra InnoCreative Carnival in Teaching and Learning (PicTL' 18)* organised by Centre for Academic Development (CADe), Universiti Putra Malaysia, 1–2 August 2018, Universiti Putra Malaysia, Selangor, Malaysia (**Silver Medal**).
10. Abd. Rahman, N. S. and **Mustaffa, M. R.** (2018). Cyberbullying awareness motion graphics video, poster presented at the International STEM Olympiad (ISTEMO 2018) Competition organised by Persatuan Guru STEM Malaysia and UPM, 20-21 December 2018, Universiti Putra Malaysia, Selangor, Malaysia (**Silver Medal**).
11. Doraisamy, S., Zand, M., Abdul Halin, A., & **Mustaffa, M. R.** (2016). OBSIS: Ontology-based semantic image segmentation using mixture models and multiple CRFs, poster presented at the 2016 *Exhibition of Invention, Research, & Innovation (PRPI 2016)* organised by Research Management Centre, Universiti Putra Malaysia, 15–16 November 2016, Universiti Putra Malaysia, Selangor, Malaysia.
12. **Mustaffa, M. R.**, Ahmad, F., Rahmat, R. W., & Mahmod, R. (2006). Content-based image retrieval using integrated colour-spatial approach, poster presented at the 2006 *Exhibition of Invention, Research & Innovation (PRPI 2006)* organised by Research Management Centre, Universiti Putra Malaysia, 22–24 August 2006, Universiti Putra Malaysia, Selangor, Malaysia (**Bronze Medal**).

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1. **Mustaffa, M. R.**, Abdul Wahab, N. A. D., O. K. Rahmat, R. W., & Nasharuddin, N. A. BajuVision: GUI. 2025. Literary Work. Filing Number LY2025W12521.

2. **Mustaffa, M. R.**, Abdul Wahab, N. A. D., O. K. Rahmat, R. W., & Nasharuddin, N. A. BajuVision: Framework & Data Flow Diagram. 2025. Literary Work. Filing Number LY2025W14541.
3. **Mustaffa, M. R.**, Abdul Wahab, N. A. D., O. K. Rahmat, R. W., & Nasharuddin, N. A. BajuVision: Source Code. 2025. Literary Work. Filing Number LY2025W14542.
4. **Mustaffa, M. R.**, Norul Rizal, N. S., Abdullah, L. N., & Nasharuddin, N. A. Smart growing chilli mobile application. 2022. Source Code. Filing Number LY2022W05515.
5. **Mustaffa, M. R.**, Shaharom, N. D. S, Sarip, J., Mohd Norowi, N., & Nasharuddin, N. A. Durian species image dataset. 2021. Artistic Work. Filing Number AR2021E05952.
6. **Mustaffa, M. R.**, Shaharom, N. D. S, Mohd Norowi, N., & Nasharuddin, N. A. Durian species recognition. 2020. Software. Filing Number LY2020002277.

OTHER PUBLICATIONS

1. *Bahan Pembelajaran Kurikulum Standard Sekolah Menengah (KSSM) Mata Pelajaran Vokasional (MPV) Produksi Multimedia Tingkatan 5*, with Resources and Education Technology Division and Curriculum Development Division, Ministry of Education Malaysia, 2021.
2. Al-rababah, K., **Mustaffa, M. R.**, Doraisamy, S., & Khalid, F. (2020). Hybrid discrete wavelet transform and histogram of oriented gradients for feature extraction and classification of breast dynamic thermogram sequences. *Proceedings of Seminar on Information Retrieval and Knowledge Management 2020 (SIRKM'20)*, 17 December 2020, online. (pp. 54 – 56). UM. (Extended Abstract).
3. *Bahan Pembelajaran Kurikulum Standard Sekolah Menengah (KSSM) Mata Pelajaran Vokasional (MPV) Produksi Multimedia Tingkatan 4*, with Resources and Education Technology Division and Curriculum Development Division, Ministry of Education Malaysia, 2019.
4. *Dokumen Standard Kurikulum dan Pentaksiran (DSKP) Kurikulum Standard Sekolah Menengah (KSSM) Mata Pelajaran Vokasional (MPV) Produksi Multimedia Tingkatan 4 dan 5* (September 2018). Curriculum Development Division, Ministry of Education Malaysia.

5. Lai, M. I, Mohd. Tohit, E. R., Idris, F., Md Noor, S., Seman, Z., & **Mustaffa, M. R.** (2017). Gamification of haematology: Making haematology fun. *Southeast Asian Higher Education Summit 2017 (SEAHES 2017)*, 25-26 October 2017, Universiti Putra Malaysia, Selangor, Malaysia. (Extended abstract).
6. Mohd Hamran, N. F. & **Mustaffa, M. R.** (2017). Content-based representation for moth recognition and retrieval: A review. *Seminar on Information Retrieval and Knowledge Management 2017 (SIRKM' 17)*, 19 July 2017, Faculty of Computer Science and Information Technology, Universiti Putra Malaysia, Selangor, Malaysia. (Extended abstract).
7. Madzin, H., Khalid, F. & **Mustaffa, M. R.** (2017). Speckle filtering method in the gonad ultrasound image for mahseer's fish (Tor Tombroides). *Seminar on Information Retrieval and Knowledge Management 2017 (SIRKM' 17)*, 19 July 2017, Faculty of Computer Science and Information Technology, Universiti Putra Malaysia, Selangor, Malaysia. (Extended abstract).
8. *Dokumen Standard Kurikulum dan Pentaksiran (DSKP) Kurikulum Standard Sekolah Menengah (KSSM) Asas Sains Komputer (ASK) Tingkatan 3* (April 2017). Curriculum Development Division, Ministry of Education Malaysia.
9. *Dokumen Standard Kurikulum dan Pentaksiran (DSKP) Kurikulum Standard Sekolah Menengah (KSSM) Asas Sains Komputer (ASK) Tingkatan 2* (April 2016). Curriculum Development Division, Ministry of Education Malaysia.
10. Yaakob, R., Perumal, T., Abdul Samat, P., Jantan, A. H., Abdul Rahman, A. R., Mustapha, N., Zulzalil, H., Mohd Hanapi, Z., & **Mustaffa, M. R.** (2016). Student Mobility Programme: A Guideline for Bachelor of Computer Science (Outbound), Faculty of Computer Science and Information Technology, Universiti Putra Malaysia.
11. **Mustaffa, M. R.** (2012). Content-based image retrieval through Extended Normalised Ridgelet-Fourier and Multi-resolution Joint Auto Correlograms (Doctoral dissertation). Universiti Putra Malaysia, Serdang, Malaysia.
12. **Mustaffa, M. R.**, Ahmad, F., Rahmat, R. W., Mahmod, R. (2007). Content-based image retrieval based on colour-spatial features. In *Compscience@putra: research bulletin of the Faculty of Computer Science and Information Technology* (pp. 12).
13. **Mustaffa, M. R.**, Ahmad, F., Rahmat, R. W., Mahmod, R. (2006). Content-based image retrieval through improved sub-block technique. In *Compscience@putra:*

research bulletin of the Faculty of Computer Science and Information Technology (pp. 26).

14. **Mustaffa, M. R.** (2006). Content-based image retrieval through Improved Sub-block technique (Master's thesis). Universiti Putra Malaysia, Serdang, Malaysia.
15. **Mustaffa, M. R.** (2005). Content-based image retrieval: An overview, seminar paper presented at the Multimedia Departmental Seminar organised by Multimedia Department, Faculty of Computer Science and Information Technology, Universiti Putra Malaysia, 14 July 2005, Faculty of Computer Science and Information Technology, Universiti Putra Malaysia.

RESEARCH GRANT

No.	Project Title	Role	Year	Source of Fund	Status
1.	Deep Transfer Learning-based Machine Vision Classification for Grading and Quality Categorization	Co-researcher	01-11-2020 – 30-04-2024	Ministry of Higher Education, Malaysia (RM99,800.00)	Completed
2.	Multimodal Hierarchical Fusion Feature Model Incorporating Attention Mechanism with World Level Alignment	Co-researcher	01-11-2020 – 30-04-2024	Ministry of Higher Education, Malaysia (RM115,500.00)	Completed
3.	Effective Durian Species Feature Representation and Recognition	Project Leader	02-04-2018 – 02-03-2022	UPM (RM50,000.00)	Completed
4.	Effective Content-based Fish Species Image Retrieval based on Enhanced Zernike Moments-Local Directional Pattern	Project Leader	01-08-2016 - 30-04-2019	Ministry of Higher Education, Malaysia (RM66,200.00)	Completed
5.	Colour Feature Generation and Classification for Effective Content-based Image Retrieval	Project Leader	01-11-2013 - 31-10-2015	UPM (RM47,200.00)	Completed (Recipient of "Insentif Geran Putra Muda Terbaik 2016")

6.	Facilitating Students' Learning through Video Annotation for Tablet Devices	Project Leader	01-08-2013 - 31-01-2015	UPM (RM15,000.00)	Completed
7.	Fusion Clahe-based Image Enhancement with Fuzzy in Enhancing the Quality of Field Image	Co-researcher	02-04-2018 – 01-07-2020	UPM (RM50,000.00)	Completed
8.	Multimodal Learning Analytics Towards Improvement of Personalized Learning	Co-researcher	15-12-2017 - 15-12-2019	UPM (RM50,000.00)	Completed
9.	MyHematology App: Mobile Learning for Hematology	Co-researcher	15-11-2017 - 14-11-2019	UPM (RM10,000.00)	Completed
10.	Student Evaluation Model for the Implementation of iCGPA in Computer Science Curriculum	Co-researcher	01-08-2016 – 31-07-2018	UPM (RM15,000.00)	Completed
11.	Blended Learning Activity pack – Integrating flashcards with a virtual learning environment for Haematology	Co-researcher	01-06-2015 - 31-05-2017	UPM (RM10,000.00)	Completed
12.	Creating Educational Mobile App for Smartphone using Mobile App Builder to Accelerate Interactive Teaching and Learning	Co-researcher	01-06-2015 - 31-05-2016	UPM (RM10,000.00)	Completed
13.	Aesthetics Energy of Image Colour-based Point of Regard Estimation for Distance Independent Non-Intrusive Eye Gaze Tracking	Co-researcher	01-12-2014 - 31-05-2018	Ministry of Higher Education, Malaysia (RM93,500.00)	Completed

KNOWLEDGE TRANSFER GRANT

No.	Project Title	Role	Year	Source of Fund	Status
1.	Program CELIK IT bersama PERNIM	Project Member	01-03-2018 – 01-03-2019	UPM (RM24,200.00)	Completed

COLLABORATION GRANT

No.	Project Title	Role	Year	Source of Fund	Status
1.	Ultra-layered perception with brain-inspired information processing for vehicle collision avoidance (ULTRACEPT)	Project Member	01-12-2018 – 30-09-2024	European Union (RM947154.89)	Completed

EXTERNAL ACADEMIC AND PROFESSIONAL SERVICES

- External Advisor Panel for the Bachelor of Information Technology (Multimedia Technology) with Honours**, Kulliyyah of Islamic Finance, Management Sciences and Hospitality (KWISH), Universiti Islam Antarabangsa Sultan Abdul Halim Mu'adzam Shah (UniSHAMS), 23 November 2024 – 31 December 2026.
- Representative of Public Higher Education Institutions (IPTA) in the Studies Committee (JKP) for the Bachelor of Computer Science (Multimedia Computing)**, Faculty of Computer Science and Information Technology, Universiti Malaya, 1 January 2025 – 31 December 2025.
- Evaluation Panel**, FRGS Proposal, Taylor's University, 2025.
- Research Secondment**, University of Leicester, United Kingdom, 22 July 2024 – 21 September 2024 under the EU Horizon 2020 Project ULTRACEPT (No. 778062) (2018-2024).
- Visiting Lecturer**, University of Munster, Germany, 28 – 31 August 2024 under the EU Horizon 2020 Project ULTRACEPT (No. 778062) (2018-2024).
- Representative of Public Higher Education Institutions (IPTA) in the Studies Committee (JKP) for the Bachelor of Computer Science (Multimedia Computing)**, Faculty of Computer Science and Information Technology, Universiti Malaya, 1 January 2025 – 31 December 2025.

Computing) programme, Faculty of Computer Science and Information Technology, Universiti Malaya, 4 November 2023 – 31 December 2024.

7. **External Reviewer for Academic Promotion Application to Associate Professor**, University of Wollongong (UOW) Malaysia, 2024.
8. **Jury**, Kongres dan Pertandingan Inovasi dalam Pengajaran dan Pembelajaran (kNOVASI 2023), organised by Pusat Pengajaran dan Pembangunan Kurikulum, Universiti Kebangsaan Malaysia, 6 - 7 September 2023.
9. **Evaluation Panel**, Geran Penyelidikan Negeri Selangor (GPNS) Proposal, Kolej Universiti Islam Antarabangsa Selangor (KUIS), 27 July – 2 August 2023.
10. **External Advisor** for BSc (Hons) in Multimedia Technology, Asia Pacific University of Technology & Innovation (A.P.U.), September 2022 – August 2024.
11. **Examination Questions Drafter Panel** for Information and Communication Technology (ICT) (Paper Code: 958/1), High School Certificate of Malaysia (STPM), Malaysian Examinations Council, 2019 – 2023.
12. **Evaluation Panel**, FRGS Proposal, Kolej Universiti Islam Antarabangsa Selangor (KUIS), 2022 – 2023.
13. **Evaluation Panel** for the application of re-accreditation of the Bachelor of Computer Science (Multimedia Computing), Faculty of Computer Science and Information Technology, Universiti Malaya, 2022.
14. **Reference Expert** for Interactive Materials Blueprint for Kurikulum Standard Sekolah Rendah (KSSR) (Revised 2017) Year 4 and Kurikulum Standard Sekolah Menengah (KSSM) Form 1, with Resources and Education Technology Division (BSTP), Ministry of Education Malaysia, 2021.
15. **Chairman** of Digital Textbook Technical Evaluation Committee for *Kurikulum Standard Sekolah Menengah (KSSM) Mata Pelajaran Vokasional (MPV) Produksi Multimedia Tingkatan 4 dan Tingkatan 5*, with Resources and Education Technology Division (BSTP), Ministry of Education Malaysia, 2021.
16. **Expert Panel (Chairman)** of the *Modul Pembelajaran Kurikulum Standard Sekolah Menengah (KSSM) Mata Pelajaran Vokasional (MPV) Produksi Multimedia Tingkatan 5*, with Resources and Education Technology Division (BSTP), and Vocational Technical Education and Training Division (BPLTV), Ministry of Education Malaysia, 2020 - 2021.

17. **Judge**, Virtual International Research and Innovation Symposium and Exposition 2021 (RISE 2021), organised by Universiti Tun Hussein Onn Malaysia (UTHM), 2021.
18. **Evaluation Panel**, FRGS Proposal Phase 1 2021, Universiti Pertahanan Nasional Malaysia (UPNM), 2021.
19. **External Advisor** for common courses review: Siri 1/2020 (Information Technology), Kolej Profesional MARA (KPM), 21 – 23 September 2020.
20. **Chairman** of Digital Textbook Technical Evaluation Committee for *Kurikulum Standard Sekolah Menengah (KSSM) Mata Pelajaran Vokasional (MPV) Produksi Multimedia Tingkatan 4 dan Tingkatan 5*, with Resources and Education Technology Division (BSTP), Ministry of Education Malaysia, 2020.
21. **Expert Panel** of the *Bahan Pembelajaran Kurikulum Standard Sekolah Menengah (KSSM) Mata Pelajaran Vokasional (MPV) Produksi Multimedia Tingkatan 4*, with Resources and Education Technology Division and Curriculum Development Division, Ministry of Education Malaysia, 2019.
22. **Drafter Panel** of the *Dokumen Standard Kurikulum dan Pentaksiran (DSKP) Kurikulum Standard Sekolah Menengah (KSSM) Mata Pelajaran Vokasional (MPV) Produksi Multimedia dan Grafik Komputer Tingkatan 4 dan Tingkatan 5*, with Curriculum Development Division, Ministry of Education Malaysia, 2018.
23. **Judge**, Invention, Innovation, & Design on E-learning (IIDEL) Competition in International Carnival on E-learning (IUCEL) 2018, 12 - 13 September 2018, IIUM, Kuala Lumpur.
24. **Drafter Panel** of the *Dokumen Standard Kurikulum dan Pentaksiran (DSKP) Kurikulum Standard Sekolah Menengah (KSSM) Asas Sains Komputer (ASK) Tingkatan 3*, with Curriculum Development Division, Ministry of Education Malaysia, 2017.
25. **Assessor** of the *Bahan Sokongan Kurikulum (Modul) Asas Sains Komputer (ASK) Tingkatan 1*, with Malaysia Digital Economy Corporation (MDEC), June 2016.
26. **Drafter Panel** of the *Dokumen Standard Kurikulum dan Pentaksiran (DSKP) Kurikulum Standard Sekolah Menengah (KSSM) Asas Sains Komputer (ASK) Tingkatan 2*, with Curriculum Development Division, Ministry of Education Malaysia, 2016.
27. **Consultant** for YASNITA e-Rezeki Action Council, 2016.

ADMINISTRATIVE EXPERIENCE

UNIVERSITY LEVEL

1. **Member**, Universiti Putra Malaysia (UPM) Artificial Intelligence (AI) Taskforce, Nov. 2025 – Nov. 2028.
2. **University Undergraduate Curriculum Sub-committee (JKKK)**, April 2024 – March 2027.
3. **Evaluation Committee Member**, Research Grant Application Evaluation (UPM), 2025 – 2026.
4. **Facilitator**, UPM Curriculum Structuring Workshops, January 2026, UPM.
5. **Jury**, *7th International Putra InnoCreative Carnival in Teaching and Learning 2025 (I-PICTL 2025) X SULAM@UPM Carnival 2025*, organised by Centre for Academic Development and Leadership Excellence (CADe-Lead), UPM, 16-17 June 2025.
6. **Committee Member**, workshop for the review of proposal papers and course framework for co-curricular credit equivalency, 6 January 2025, Co-Curriculum and Student Development Center (PKPP), UPM.
7. **Evaluation Committee Member**, Research Grant Application Evaluation (UPM), 2023 – 2024.
8. **Evaluation Panel**, Pahang Research and Education Grants 2024-2025, Universiti Putra Malaysia, 2024.
9. **Committee Member**, workshop for the review of proposal papers and course framework for co-curricular credit equivalency, 12 July 2024, Co-Curriculum and Student Development Center (PKPP), UPM.
10. **Evaluation Panel**, Geran Insentif Penyelidikan untuk Pengajaran dan Pembelajaran (GIPP), Centre for Academic Development and Leadership Excellence (CADe-Lead), UPM, 2023.
11. **Evaluation Panel**, Malaysian Research University Network (MRUN) Research Officer Grant Scheme (MROGS), Universiti Putra Malaysia, 2023.
12. **Evaluation Panel**, Geran Universiti Putra Malaysia Kitaran 2/ 2023, Universiti Putra Malaysia, 2023.
13. **University Graduate Studies Curriculum Sub-committee (JKKKPSU)**, August 2020 – July 2023.
14. **Evaluation Panel** for UPM Micro-credential course: Chatbot for Learning with DialogflowES, 2022.

15. **Jury**, International Putra InnoCreative Poster Competition, International Putra InnoCreative Carnival in Teaching and Learning 2022 (PicTL 2022), organised by Centre for Academic Development (CADe), UPM, 25 - 28 October 2022.
16. **Jury**, International University Carnival on E-Learning (IUCEL) 2022, organised by Centre for Academic Development (CADe), UPM, 28 - 30 June 2022.
17. **Evaluation Committee Member**, Research Grant Application Evaluation (UPM), 2021 – 2022.
18. **Jury**, International Putra InnoCreative Poster Competition, International Putra InnoCreative Carnival in Teaching and Learning 2021 (PicTL 2021), organised by Centre for Academic Development (CADe), UPM, 21 - 28 October 2021.
19. **UPM Library Committee**, June 2020 – July 2021.
20. **Jury**, International Putra InnoCreative Poster Competition, International Putra InnoCreative Carnival in Teaching and Learning 2020 (PicTL 2020), organised by Centre for Academic Development (CADe), UPM, 22 - 30 October 2020.
21. **Jury**, Putra InnoCreative Competition, Putra InnoCreative Carnival in Teaching and Learning 2019 (PICTL'19) organised by Centre for Academic Development (CADe), UPM, 16 - 17 October 2019.

FACULTY LEVEL

1. **Committee Member**, Outcome Based Education (OBE), 7 June 2024 – 6 June 2026.
2. **Head of Group 2 for COPPA Document Preparation for Master's by Research and Doctor of Philosophy (PhD) Programmes**, 22 October 2024 – 21 October 2025.
3. **Evaluation Committee Member**, Comprehensive Examination (CE) questions, Graduate Studies, Semester I 2024/2025.
4. **Faculty Undergraduate Curriculum Committee (JKPF)**, April 2012 – February 2024.
5. **Committee Member**, Programme Self-Review Report (PSRR) for Undergraduate Programme, February 2021 – February 2023.
6. **Committee Member**, FSKTM Strategic Plan 2021-2025, 2022.
7. **Evaluation Committee Member**, Research Project Progress Report and Final Report, 2021.

8. **Representative of Employer, Occupational Safety and Health Committee (JKKP-FSKTM)**, March 2015 - December 2021.
9. **Assessor**, Bachelor Dissertation (FEM4959A and FEM4959B) for Department of Social and Development Sciences, Faculty of Human Ecology, Semester I 2019/2020, Semester II 2018/2019.
10. **Steering Committee**, iCGPA FSKTM, September 2016 – August 2020.
11. **Emergency Response Team (ERT)**, October 2016 – November 2019.
12. **Evaluation Committee Member**, Comprehensive Examination (CE) questions, Graduate Studies, Semester I 2019/2020.
13. **Risk Management Committee Member**, October 2016 – September 2018.
14. **Member**, Curriculum Review for Diploma programme at the faculty level (FSKTM), 2018.
15. **Evaluation Committee Member**, Final Exam Questions for Postgraduate Courses, Semester I 2016/2017.
16. **Utility Saving Committee Member**, May 2015 – May 2017.
17. **Assessment Committee Member**, Research Project Progress and Final Reports, 2017.
18. **Project Supervisor**, Final Year Scientific Project for *Program Bacelor Sains Pembangunan Manusia dan Teknologi Maklumat, BSPMTM (FEM4996)*, Semester II 2014/2015, Semester II 2015/2016.
19. **Computing Accreditation Commission (ABET) Committee**, August 2014 – July 2016.
20. **Member**, formation of the new Master's Program without Thesis (Master of Multimedia Informatics), 2012 – 2015.
21. **Supervising Lecturer**, Students' Industrial Training (SKM4901), since 2013.
22. **Committee Member**, Curriculum Review for Undergraduate and Postgraduate programmes at the faculty level (FSKTM), 2012 – present.
23. **Head of Invigilator**, Undergraduate Final Examination, since 2012.
24. **Examiner Panel**, Centralised Answer Scripts Marking Workshop for UPM-IPTS Diploma Franchise Programme, 6 – 8 December 2006, Sepang, Selangor, Malaysia.

DEPARTMENT LEVEL

1. **Awards Committee**, March 2024 – February 2027.
2. **Assessor**, Final Year Scientific Project (SKM4950), since 2024.
3. **Multimedia Department Undergraduate Curriculum Committee**, February 2013 – January 2023.
4. **iCGPA Committee for Undergraduate Programme**, January 2017 – January 2020.
5. **Publicity Committee**, August 2012 - July 2013.
6. **Assessor**, Final Year Scientific Project (SKM4949), since 2018.
7. **Assessor**, Final Year Scientific Project (SKM4999), 2013 – 2018.
8. **Reviewing Member**, Bachelor of Computer Science (Multimedia) Curriculum, since 2013.
9. **Reviewing Committee Member**, Final Exam Question and Answer schemes, since 2011.
10. **Head of Academic Advisor**, 2006.
11. **Exhibition Committee**, 2006.
12. **Course Moderator**, Audio Visual Digitisation (SKM4212), Semester II 2017/2018.
13. **Course Moderator**, Digital Image Processing (SKM4205), Semester II 2015/2016.
14. **Course Moderator**, Introduction to Multimedia (SKM2300), Semester I 2016/2017, Semester I 2015/2016, Semester I 2014/2015.
15. **Course Moderator**, Multimedia Application Development (SKM3300), Semester II 2013/2014.
16. **Course Moderator**, Multimedia Technology (SMM3001), Semester I 2017/2018, Semester II 2014/2015, Semester II 2013/2014, Semester I 2013/2014, Semester II 2006/2007.
17. **Course Coordinator**, Introduction to Multimedia (SMM2005), Semester I 2006/2007.
18. **Course Coordinator**, Basics of Multimedia Technology (SMM2011) for Diploma in Computer Science (Twinning Programme UPM-IPTS), Semester I 2006/2007.
19. **Course Coordinator**, Multimedia Technology (SMM3001) for BCompSc (Twinning Programme UPM-IPTS), Semester I 2006/2007.
20. **Course Coordinator**, Multimedia Technology (SMM3001) for BCompSc (Distance Learning Programme), Semester I 2006/2007.

OTHER RESPONSIBILITIES FOR UNIVERSITY / FACULTY / DEPARTMENT EVENTS

1. **Management Committee Member**, Preparation of Inaugural Lecture Textbook Manuscripts (Prof. Datin Dr. Hamidah Ibrahim), 2025, FSKTM, UPM.
2. **Committee Member**, 2nd UPM Computer Science and Information Technology Research International Exhibition 2025 (UCRIX 2025), FSKTM, UPM.
3. **Participant of Pertandingan Kibar Jalur Gemilang Inter-PTJ Program Semarak Merdeka 2025**, Sambutan Hari Kemerdekaan ke-68 Peringkat UPM, 21 August 2025.
4. **Assistant Secretary**, Innovate Carlo Rino - UPM UI / UX Competition 2024, 31 July 2024, FSKTM, UPM
5. **Evaluation Panel**, FSKTM Appreciation Day, 19 December 2023, FSKTM, UPM.
6. **Gemilang Award Committee Member**, 2021 Quality and Innovation Day, 6 August 2021, FSKTM, UPM.
7. **Registration Committee Member**, “Session from The Industry Perspective: Challenges with Tools and Technologies” Programme, 27 May 2021, FSKTM, UPM.
8. **Committee Member**, 2018 Jom Gegaria ICT UPM Carnival, 2018, FSKTM, UPM.
9. **Committee Member**, Hari Raya Aidilfitri Celebration and FSKTM 20-Years Family Day, 2018, FSKTM, UPM.
10. **Judge and Committee Member**, Nobel Laureate’s Outreach Camp (NLOC) 2018 – Scientist of Tomorrow, 27 - 30 August 2018, UPM.
11. **Committee Member**, CSIT 20th Anniversary Fun Run 2018, 15 April 2018, FSKTM, UPM.
12. **Committee Member**, FSKTM 20th Anniversary Celebration, 2018, FSKTM, UPM.
13. **Officer**, Perarakan Pegawai Akademik Majlis Konvokesyen UPM Ke-24 (Sesi 2), 27 – 30 October 2018.
14. **Committee Member**, Silver Jubilee Celebration, 2017-2018, FSKTM, UPM.
15. **Officer**, pameran fakulti sempena Ekspo Pertanian dan Pesta Konvokesyen, 2014, 2015, 2016, UPM.
16. **Officer**, Asasi Education Fair 2016, UPM.
17. **Committee Member**, 2015 Quality and Innovation Day, 16 October 2015, FSKTM, UPM.

18. **Sub-Committee Member**, Innovation Open Day, 18 - 19 September 2014, FSKTM, UPM.
19. **Steering Committee Member**, CS Alumni Home Coming: A Morning Session in the Faculty, 2014, FSKTM, UPM.
20. **Officer**, Postgraduate Education Fair 2012, UPM.

CONFERENCES / EXHIBITIONS / TRAININGS ATTENDED

CONFERENCES AND EXHIBITIONS AS PRESENTER / TECHNICAL SESSION CHAIR / INVITED SPEAKER

1. **Presenter**, *Putra InnoCreative Poster Competition, 7th International Putra InnoCreative Carnival in Teaching and Learning 2025 (I-PICTL 2025) X SULAM@UPM Carnival 2025*, poster entitled “Digital fabric visualisation for Malaysian traditional attire using AI-enhanced mobile application”, 16-17 June 2025, UPM, Selangor, Malaysia (**Silver Medal**).
2. **Presenter**, *2025 3rd International Conference on Inventive Computing and Informatics (ICICI 2025)*, paper entitled “Facial emotion recognition for online classrooms using lightweight transfer learning”, 4-6 June 2025, Karnataka, India.
3. **Presenter**, *6th International Conference on Cybernetics and Intelligent Systems (ICORIS 2024)*, paper entitled “IoT-based monitoring of chili plant growth”, 29-30 November 2024, Solo-Central Java, Indonesia.
4. **Presenter and Session Chair**, *16th International Conference on Knowledge and Systems Engineering (KSE 2024) and The Sixth International Conference on Information Retrieval and Knowledge Management (CAMP 2024)*, paper entitled “An enhanced method for content-based underwater fish image retrieval using hybrid features”, 5-7 November 2024, Kuala Lumpur, Malaysia.
5. **Presenter**, *International Putra InnoCreative Poster Competition, International Putra InnoCreative Carnival in Teaching and Learning 2023 (PicTL 2023)*, poster entitled “Automatic entity relationship diagram detection and recognition for assisting teaching and learning in database course”, 14-16 November 2023, UPM, Selangor, Malaysia (**Gold Medal**).
6. **Keynote Speaker**, (Title: Intelligent Content-based Multimedia Representation for Recognition and Retrieval: Practices and Challenges), organised by the 3rd

International Conference on Computer Vision, Application and Algorithm (CVAA 2023), 28 October 2023, online.

7. **Presenter**, 2023 10th *Electrical Engineering, Computer Science, and Informatics Conference (EECSI 2023)*, paper entitled “Region-based Convolutional Neural Network and Tesseract Optical Character Recognition for recognising Entity Relationship Diagram”, 20-21 September 2023, Palembang, Indonesia.
8. **Presenter**, 2022 5th *International Symposium on Advanced Intelligent Informatics (SAIN)*, paper entitled “Deep Learning Mango Fruits Recognition based on TensorFlow Lite”, 14 September 2022, online.
9. **Invited Speaker**, (Title: Intelligent Multimedia Recognition and Retrieval: Practices and Challenges), organised by Center of Computer Science Studies, Faculty of Computer and Mathematical Sciences, UiTM Shah Alam, 20 June 2022, online.
10. **Invited Speaker**, (Title: Analytic Approaches in Agriculture), organised by Center of Computer Science Studies, Faculty of Computer and Mathematical Sciences, UiTM Shah Alam, 13 November 2021, online.
11. **Session Chair**, *Seminar on Information Retrieval and Knowledge Management 2020 (SIRKM'20)*, 17 December 2020, online.
12. **Invited Speaker**, *Multimedia Department Seminar (FSKTM, UPM)*, paper entitled “A Colour-based Building Recognition using Support Vector Machine”, 15 December 2020, online.
13. **Presenter**, *International Putra InnoCreative Poster Competition, International Putra InnoCreative Carnival in Teaching and Learning 2020 (PICTL 2020)*, poster entitled “Learning About Durian Varieties Through Recognition App”, 22 – 30 October 2020, UPM, Selangor, Malaysia (**Silver Medal**).
14. **Presenter and Session Chair**, *International Conference on Interdisciplinary Computer Science and Engineering (ICICSE 2020)*, paper entitled “Outfit Classification and Recommendation Based on Integrated Features and Bagged Decision Tree”, 5 - 6 October 2020, virtual conference.
15. **Presenter**, 7th *International Conference on Applied Science and Technology (ICAST 2020)*, paper entitled “Grain recognition based on colour and shape analysis”, 13 – 14 July 2020, virtual conference (**Best Paper Award**).
16. **Presenter and Session Chair**, 3rd *International Conference on Innovations in Computer Science and Engineering (iCiCSE 2019)*, paper entitled “Durian species

- recognition based on fast discrete curvelet transform and k-nearest neighbour", 26 - 28 June 2019, Miri, Sarawak, Malaysia.
17. **Presenter**, *5th International Conference on Applied Science and Technology (ICAST 2019)*, paper entitled "Automated recyclable waste classification using multiple shape-based properties and quadratic discriminant", 1 – 2 April 2019, Johor Bahru, Johor Darul Takzim, Malaysia.
18. **Presenter**, *4th International Conference on Multimedia and Image Processing (ICMIP 2019)*, paper entitled "Dress me up!: Content-based clothing image retrieval", 19 - 21 January 2019, Kuala Lumpur, Malaysia (**Best Presentation Award**).
19. **Presenter**, *International Conference on Information and Communication Technology for Transformation 2018 (IC-ICT4T 2018)*, paper entitled "Content-based image retrieval for fish based on Extended Zernike Moments-Local Directional Pattern-Hue colour space", 3 - 5 October 2018, Bandung, Indonesia.
20. **Presenter**, *1st International Conference and Workshop on Telecommunication, Computing, Electronics and Control 2018 (ICW-TELKOMNIKA 2018)*, paper entitled "A colour-based building recognition using support vector machine", 18 - 21 September 2018, Yogyakarta, Indonesia.
21. **Presenter**, *2018 Putra InnoCreative Carnival in Teaching and Learning (PicTL' 18)*, poster entitled "LaMarlImE: Learning about marine invertebrates through image example", 1 – 2 August 2018, UPM, Selangor, Malaysia (**Silver Medal**).
22. **Presenter and Session Chair**, *2nd International Conference on Innovations in Computer Science and Engineering (iCiCSE 2018)*, paper entitled "Fruits recognition based on texture features and k-nearest neighbour", 30 - 31 July 2018, Kuching, Sarawak, Malaysia (**Best Paper Award**).
23. **Presenter and Session Chair**, *2018 Fourth International Conference on Information Retrieval and Knowledge Management (CAMP'18)*, paper entitled "Durian species recognition system based on global shape representations and k-nearest neighbours", 26 - 28 March 2018, Kota Kinabalu, Malaysia.
24. **Presenter and Session Chair**, *2017 IEEE International Conference on Signal and Image Processing Applications (IEEE ICSIPA 2017)*, paper entitled "Content-based fauna image retrieval system", 12 - 14 September 2017, The Waterfront Hotel, Kuching, Sarawak, Malaysia.

25. **Session Chair**, *Seminar on Information Retrieval and Knowledge Management 2017 (SIRKM' 17)*, 19 July 2017, FSKTM, UPM, Serdang, Selangor, Malaysia.
26. **Invited Speaker**, *MYREN Futurescape 2016*, talk entitled “Multimedia information retrieval”, 22 - 24 November 2016, Ministry of Higher Education Malaysia, Putrajaya, Malaysia.
27. **Session Chair**, *2nd International Conference on Computer Assisted System in Health (CASH 2016)*, 1 – 2 September 2016, Kuala Lumpur, Malaysia.
28. **Presenter and Session Chair**, *Third International Conference on Information Retrieval and Knowledge Management (CAMP'16)*, paper entitled “Content-based image retrieval system for marine invertebrates”, 23 - 24 August 2016, Hatten Hotel Melaka, Malaysia (**Best Paper Award**).
29. **Presenter and Session Chair**, *2016 3rd International Conference on Computer, Communication and Control Technology (I4CT 2016)*, paper entitled “Multi-resolution joint auto correlograms for content-based image retrieval”, 19 - 21 April 2016, Kota Kinabalu, Sabah, Malaysia.
30. **Presenter**, *2016 3rd International Conference on Computer, Communication and Control Technology (I4CT 2016)*, paper entitled “Content-based image retrieval using colour models and linear discriminant analysis”, 19 - 21 April 2016, Kota Kinabalu, Sabah, Malaysia.
31. **Presenter**, *2016 3rd International Conference on Computer, Communication and Control Technology (I4CT 2016)*, paper entitled “Vid2U: Facilitating students' learning through video annotation for tablet device”, 19 - 21 April 2016, Kota Kinabalu, Sabah, Malaysia.
32. **Session Chair**, International Conference on Computer Assisted System in Health (CASH 2014), 19 – 21 December 2014, Kuala Lumpur, Malaysia.
33. **Presenter**, *10th Asia Information Retrieval Societies Conference (AIRS 2014)*, paper entitled “Multi-resolution shape-based image retrieval using Ridgelet transform”, 3 - 5 December 2014, Kuching, Sarawak, Malaysia.
34. **Invited speaker**, Golden Key Malaysia Conference and Workshops, 19 – 21 September 2014, UTM Skudai, Johor.
35. **Presenter and Session Chair**, *2014 3rd International Conference on Computer Technology and Science (ICCTS 2014)*, paper entitled “Facilitating students' learning through m-lms for tablet device”, 7 - 8 June 2014, Sarawak, Malaysia.

36. **Session Chair**, IADIS International Conference on Internet Technologies & Society (ITS 2013), 29 November – 1 December 2013, Kuala Lumpur, Malaysia.
37. **Presenter**, *International Conference on Information Retrieval and Knowledge Management (CAMP 2012)*, paper entitled “Multi-resolution joint auto correlograms: Determining the distance function”, 13 - 15 March 2012, Mines Wellness Hotel, Selangor, Malaysia.
38. **Presenter**, *International Conference on Information Retrieval and Knowledge Management (CAMP 2010)*, paper entitled “Invariant generalised Ridgelet-Fourier for shape-based image retrieval”, 17 - 18 March 2010, Shah Alam Convention Centre, Shah Alam, Selangor, Malaysia (**Best Paper Award**).
39. **Presenter**, *Seventh IASTED International Conference on Signal Processing, Pattern Recognition, and Applications (SPPRA 2010)*, paper entitled “Shape descriptor based on invariant generalised Ridgelet transform for $m \times n$ images”, 17 - 19 February 2010, Innsbruck, Austria.
40. **Presenter**, *IEEE International Conference on Signal and Image Processing Applications (ICSIPA 2009)*, paper entitled “Generalised Ridgelet-Fourier for $m \times n$ images: Determining the normalisation criteria”, 18 - 19 November 2009, Cititel Mid Valley Hotel, Kuala Lumpur, Malaysia.
41. **Presenter**, *International Symposium on Information Technology 2008 (ITSIM '08)*, paper entitled “Dominant colour descriptor with spatial information for content-based image retrieval”, 26 – 29 August 2008, Kuala Lumpur Convention Centre, Kuala Lumpur, Malaysia.
42. **Presenter**, *National Conference on Information Retrieval and Knowledge Management (CAMP 2008)*, paper entitled “A comparative study of shape descriptors for content-based image retrieval”, 18 March 2008, Mines Palace Beach and Spa, Kuala Lumpur, Malaysia.
43. **Presenter**, *2006 Exhibition of Invention, Research & Innovation (PRPI 2006)*, poster entitled “Content-based image retrieval using integrated colour-spatial approach”, 22 – 24 August 2006, Universiti Putra Malaysia, Selangor, Malaysia (**Bronze Medal**).
44. **Presenter**, *Regional Computer Science Postgraduate Conference 2006 (ReCSPC '06)*, paper entitled “Content-based image retrieval using integrated colour-spatial approach”, 27 - 28 June 2006, Pulau Pinang, Malaysia.

45. **Invited Speaker**, *Multimedia Departmental Seminar*, paper entitled “Content-based image retrieval: An overview”, 14 July 2005, Faculty of Computer Science and Information Technology, Universiti Putra Malaysia, Selangor, Malaysia.
46. **Presenter**, *National Computer Science Postgraduate Colloquium 2005 (NaCSPC '05)*, paper entitled “Region-based image retrieval using modified sub-block technique”, 27 - 28 June 2005, Pulau Pinang, Malaysia.
47. **Invited Speaker**, *Multimedia Departmental Seminar Notes Series 2004/2005*, paper entitled “Region-based image retrieval using modified dominant colour region technique”, FSKTM, UPM.
48. **Presenter**, *Information Technology Colloquium 2004 (INTEC '04)*, paper entitled “A review of content-based image retrieval techniques”, 1 June 2004, Serdang, Selangor, Malaysia.

CONFERENCE / WORKSHOPS / TRAININGS ATTENDED AS PARTICIPANT

1. Seminar on Information Retrieval and Knowledge Management 2025 (SIRKM'25), 25 November 2025, online.
2. 2025 the 7th International Conference on Interdisciplinary Computer Science and Engineering (ICICSE 2025), 5 November 2025, Putrajaya, Malaysia.
3. UPM-FAHLA Medical Physics Course Level 3: Artificial Intelligence in Healthcare and Advanced Technology by Physics Department, Faculty of Science, UPM, 2 October 2024, UPM.
4. Programme on Instructional Leadership Program: Learning and Teaching in Higher Education by Ministry of Higher Education, 5 – 7 June 2024, AKEPT.
5. Course on Creativity, Innovation, and Transformation by Registrar, UPM, 30 August 2022, UPM.
6. Course on Basic Management and Administration by Registrar, UPM, 14 – 15 June 2022, UPM.
7. Course on Certified Internet of Things Specialist (CIoTS) by iTrain (M) Sdn Bhd, 1 – 3 December 2021, online.
8. Workshop on Master Python in 2 Days!, IEEE Malaysia Kuala Lumpur Subsection, 31 July – 1 August 2021, online.
9. Webinar on Occupational Safety and Health, Occupational Safety and Health Committee UPM, 14 – 15 July 2021, online.

10. Course on Android Certified Associate Developer (ACAD) by iTrain (M) Sdn Bhd, 5 – 9 July 2021, online.
11. Workshop on Introduction to the Astronomical Data, 2021 Fifth International Conference on Information Retrieval and Knowledge Management (CAMP'21), 15 – 16 June 2021, online.
12. Workshop on Fundamental of Semantic Technology, 2021 Fifth International Conference on Information Retrieval and Knowledge Management (CAMP'21), 15 – 16 June 2021, online.
13. Workshop on Artificial Intelligence, Machine Learning, and Deep Learning using Scilab, IEEE Signal Processing Society Malaysia Chapter, 19 September 2019, Pullman KLCC Hotel, Kuala Lumpur.
14. Workshop on Preparation of Assessors for Secondary School Standard Curriculum Textbook 2019 (Central Zone 3) by Resources and Education Technology Division (BSTP), Ministry of Education Malaysia, 20 – 22 March 2019, De Palma Ampang Hotel, Ampang, Selangor.
15. Workshop on IoT for Elderly, 17 - 18 January 2019, FSKTM, UPM.
16. MCMC Research Symposium, 21 November 2018, Putrajaya Marriott Hotel, Putrajaya.
17. Workshop on Best Practices in Offline and Online Experimentation and the Role of Click Data in Testing, 28 March 2018, Kota Kinabalu, Sabah, Malaysia.
18. Workshop on Scalable Learning of Graphical Models, 28 March 2018, Kota Kinabalu, Sabah, Malaysia.
19. Seminar on Driving Industry 4.0 with Deep Learning, 17 January 2018, UiTM Shah Alam.
20. Seminar on High Impact Educational Practices (HIEPs), 25 May 2017, UPM.
21. Putra Massive Open Online Course (PutraMOOC) Workshop, 8 – 9 May 2017, UPM.
22. Course on iCGPA Integrated Assessment, 2 March 2017, FSKTM, UPM.
23. Seminar on Unshackling Young Academics, 31 October – 2 November 2016, Office of the Deputy Vice Chancellor (Research & Innovation), UPM.
24. Basic Occupational First Aid, CPR, & AED Training Course, 30 November – 1 December 2015, FSKTM, UPM.
25. Training on using Photoshop to Create Mobile Apps for IoS and Android Easily, 21 July 2014, FSKTM, UPM.

26. Training on Beginning: IoT Mobile Apps Development, 24 - 28 March 2014, FSKTM, UPM.
27. High Performance Transformation Course for New Lecturers, 6 - 8 December 2013, Seremban, Negeri Sembilan.
28. Seminar on Scholarship of Teaching and Learning (SoTL), 26 - 27 November 2013, Office of the Deputy Vice Chancellor (Research & Innovation), UPM.
29. Android Apps Development Training, 2 - 4 July 2013, Caspian Technology, Seri Kembangan, Selangor.
30. Basic Teaching Course (KAP), 29 January – 5 February 2013, DKAP, UPM.
31. Mind Transformation Program, 14 - 18 January 2013, DKAP, UPM.
32. Make Learning Fun: Go Mobile, 21 June 2012, UPM.
33. Writing and Publishing for ISI Impact Factor Journal Workshop, 22 March 2012, FSKTM, UPM.

AWARDS RECEIVED

INTERNATIONAL

Academic

1. **Silver Medal**, Abdul Wahab, N. A. D. and **Mustaffa, M. R.** (2025). Digital fabric visualisation for Malaysian traditional attire using AI-enhanced mobile application, poster presented at the *Putra InnoCreative Poster Competition, 7th International Putra InnoCreative Carnival in Teaching and Learning 2025 (I-PICTL 2025) X SULAM@UPM Carnival 2025* organised by Centre for Academic Development and Leadership Excellence (CADe-Lead), UPM, 16-17 June 2025.
2. **Gold Medal**, **Mustaffa, M. R.** & Ang, G. Z. (2023). Automatic entity relationship diagram detection and recognition for assisting teaching and learning in database course, poster presented at the *International Putra InnoCreative Poster Competition, International Putra InnoCreative Carnival in Teaching and Learning 2023 (PicTL 2023)* organised by Centre for Academic Development and Leadership Excellence (CADe-Lead), UPM, 14 – 16 November 2023.
3. **Gold Medal**, **Mustaffa, M. R.**, Shaharom, N. D. S, Mohd Norowi, N., & Nasharuddin, N. A. (2020). Learning about durian varieties through recognition app., poster presented at the International Putra InnoCreative Poster Competition,

International Putra InnoCreative Carnival in Teaching and Learning 2020 (*PicTL 2020*) organised by Centre for Academic Development (CADe), UPM, 22 – 30 October 2020.

Research

1. **Best Constructive Review Award, Global Research Conference 2020 (GRaCe 2020)**, 16 – 18 October 2020, online conference.
2. **Best Paper Award, Mustaffa, M. R.**, Nachiappan, I. N., Abdullah, L. N., Khalid, F., & Hussin, M. (2020). Grain recognition based on colour and shape analysis, *7th International Conference on Applied Science and Technology (ICAST 2020)*, 13 – 14 July 2020, online conference.
3. **Best Presentation Award, Mustaffa, M. R.**, Goh, S. W., Abdullah, L. N., & Nasharuddin, N. A. (2019). Dress me up!: Content-based clothing image retrieval, *4th International Conference on Multimedia and Image Processing (ICMIP 2019)*, 19 - 21 January 2019, Kuala Lumpur, Malaysia. ACM.
4. **Best Paper Award**, Kamal Ariffin, N. I., **Mustaffa, M. R.**, Abdullah, L. N., & Nasharuddin, N. A. (2018). Fruits recognition based on texture features and k-nearest neighbour, *2nd International Conference on Innovations in Computer Science and Engineering (ICiCSE 2018)*, 30 - 31 August 2018, Kuching, Sarawak, Malaysia.
5. **Best Paper Award, Mustaffa, M. R.**, Mohd. Norowi, N, & Sim, M. Y. (2016). Content-based image retrieval system for marine invertebrates, *2016 Third International Conference on Information Retrieval and Knowledge Management (CAMP'16)*, 23 - 24 August 2016, Hatten Hotel Melaka, Malaysia. IEEE.
6. **Best Paper Award, Mustaffa, M. R.**, Ahmad, F., Mahmod, R., & Doraisamy, S. (2010). Invariant generalised Ridgelet-Fourier for shape-based image retrieval", *First International Conference on Information Retrieval and Knowledge Management (CAMP '10)*, 17 - 18 March 2010, Shah Alam Convention Center, Shah Alam, Selangor, Malaysia. IEEE.

NATIONAL

Academic

1. **Anugerah Pengajaran Pensyarah Cemerlang (Outstanding Lecturer Teaching Award)**, FSKTM, UPM, 2016, 2017, 2019, 2022.
2. **Third place**, Mohd Norowi, N., Madzin, H., Nasharuddin, N. A., ..., & **Mustaffa, M. R.** (2019). Best Faculty/Centre in Teaching and Learning Innovation Practices Competition 2019, *Putra InnoCreative Carnival in Teaching and Learning (PicTL' 19)*.
3. **Silver Medal**, Abdullah, L. N. & **Mustaffa, M. R.** (2019). Visualisation effects of subjective extracted text using parse tree for English learning, poster presented at the 2019, *Putra InnoCreative Carnival in Teaching and Learning (PicTL' 19)* organised by Centre for Academic Development (CADe), UPM, 16–17 October 2019.
4. **Silver Medal**, **Mustaffa, M. R.**, Abdullah, L. N., & Nasharuddin, N. A. (2018). LaMarlImE: Learning about marine invertebrates through image example, poster presented at the 2018 *Putra InnoCreative Carnival in Teaching and Learning (PicTL' 18)* organised by Centre for Academic Development (CADe), UPM, 1 – 2 August 2018.
5. **Anugerah Penyeliaan Pelajar Cemerlang 2016 (Outstanding Student Supervision Award 2016)**, FSKTM, UPM, 2017.

Research

1. **Anugerah Harta Intelek (Intellectual Property Award)**, FSKTM, UPM, 2020, 2021, 2022.
2. **Gold Medal**, Albahari, E., Madzin, H., Rahmat, R. W., & **Mustaffa, M. R.** (2020). Global and local descriptors in triplet fusion method for field image enhancement, *MARDI Science & Technology Exhibition 2020*, organised by MARDI, 10–12 November 2020.
3. **Insentif Geran Putra Muda Terbaik 2016 (Best Young Putra Grant Incentive 2016)**, UPM, 2017.
4. **Top 3 FSKTM Academic Staff (Senior Lecturer Category) with the most number of publications as Corresponding Author**, Majlis Apresiasi Penyelidikan 2017, UPM.

5. **Anugerah Geran Penyelidikan Cemerlang 2014 (Outstanding Research Grant Award 2014)**, FSKTM, UPM, 2015.
6. **Anugerah Penerbitan Cemerlang 2014 (Outstanding Publication Award 2014)**, FSKTM, UPM, 2015.
7. **Bronze Medal, Mustaffa, M. R.**, Ahmad, F., Rahmat, R. W., & Mahmod, R. (2006). Content-based image retrieval using integrated colour-spatial approach, poster presented at the *2006 Exhibition of Invention, Research & Innovation (PRPI 2006)* organised by Research Management Centre (RMC), UPM, 22 – 24 August 2006.

Services

1. **Anugerah Perkhidmatan Cemerlang (Outstanding Service Award)**, UPM, 2019.
2. **Sijil Perkhidmatan Cemerlang (Certificate of Outstanding Service)**, UPM, 2004, 2006, 2008, 2013, 2014, 2015, 2016, 2017, 2018, 2019.

Community

1. **Anugerah Khidmat Komuniti dan Masyarakat Cemerlang 2022 (Outstanding Community and Community Service Award 2022)**, 2D animation program collaboration with Sekolah Menengah Kebangsaan King George V (SMKKGV), FSKTM, UPM, 2023.
2. **Anugerah Khidmat Komuniti dan Masyarakat Cemerlang 2021 (Outstanding Community and Community Service Award 2021)**, Microsoft Office learning for orphan and vulnerable children (OVC), FSKTM, UPM, 2022.
3. **Anugerah Khidmat Komuniti dan Masyarakat Cemerlang 2021 (Outstanding Community and Community Service Award 2021)**, IT skills program for orphan and vulnerable children (OVC) in Malaysia, FSKTM, UPM, 2022.
4. **Silver Medal**, Abd. Rahman, N. S. and **Mustaffa, M. R.** (2018). Cyberbullying awareness motion graphics video, poster presented at the *International STEM Olympiad (ISTEMO 2018) Competition* organised by Persatuan Guru STEM Malaysia and UPM, Universiti Putra Malaysia, Selangor, Malaysia, 20-21 December 2018.
3. **Anugerah Sukan Cemerlang 2006 (Outstanding Sports Award 2006)**, FSKTM, UPM, 2007.

RECOGNITION AT INTERNATIONAL AND UNIVERSITY LEVEL

PHD THESIS EXTERNAL EXAMINER

1. Yusof, N., Model Capaian Imej Motif Songket Berasaskan Teknik Analisis Komponen Utama dan Jarak Kuadratik Geometri, Universiti Kebangsaan Malaysia, Malaysia, 2023.
2. Hema, N., Automatic Segmentation of Liver and Tumor from Abdominal CT Images for Analysis and Classification, Visvesvaraya Technological University, Karnataka State, India, 2022.
3. Yusof, N., Model Capaian Imej Hampir Berasaskan Teknik Analisis Komponen Utama dan Pengukuran Jarak Quadratik Geometri, Universiti Kebangsaan Malaysia, Malaysia, 2021.
4. Mekali, V., Medical Image Analysis using Computational Methods to Detect and Diagnose Cancer Tumor, Visvesvaraya Technological University, Karnataka State, India, 2021.
5. T. K. Sahoo, Principal Component Analysis in Facial Feature Extraction and Application, Indian Institute of Technology (Indian School of Mines) Dhanbad, Jharkhand, India, 2021.
6. A. Viji Amutha Mary, A Study on Optimized Data Perturbation Techniques for Privacy Preserving of Images, Sathyabama University, Tamilnadu, India, 2017.

JOURNAL EDITORIAL BOARD

1. **Editor-in-Chief**, Journal of Intelligent Media Computing (JIMC), Oct. 2025 – Sept. 2028.
2. Journal of Information Retrieval and Knowledge Management (JIRKM), 2023 – present.
3. International Journal of Advanced Computer Research (IJACR), 2018 – present.
4. Journal of Information System and Technology Management (JISTM), 2016 - present.

JOURNAL / PROCEEDINGS EDITOR

1. **Editor (Multimedia and Information Retrieval)**, IEEE Proceedings of the 7th International Conference on Interdisciplinary Computer Science and Engineering (ICICSE 2025).
2. **Guest Editor**, MJCS Special Issue 2/2021: “Information Retrieval and Knowledge Management, 2022, Universiti Malaya.

JOURNAL REVIEWER

Total journal papers reviewed: 70

1. Malaysian Journal of Computer Science (MJCS), 2015 – 2018, 2021 – 2022, 2025.
2. Aquaculture International, 2025.
3. Multimedia Tools and Applications, 2025.
4. ASEAN Journal on Science and Technology for Development, 2025.
5. Pertanika Journal of Science and Technology, 2023, 2025.
6. Digital Signal Processing (DSP), 2018, 2020 – 2024.
7. Artificial Intelligence Review, 2024.
8. Journal of Supercomputing, 2024.
9. Pattern Recognition, 2021 - 2023.
10. Neural Processing Letters, 2023.
11. IEEE Access, 2018 – 2020, 2022.
12. Computers and Electronics in Agriculture (COMPAG), 2020, 2022.
13. ASM Science Journal, 2022.
14. Journal of Information and Communication Technology (JICT), 2021.
15. International Journal of Advanced Computer Research (IJACR), 2019 – 2020.
16. KSII Transactions on Internet and Information Systems (KSII T Internet Info), 2015 – 2016, 2020.
17. Pertanika Journal of Science and Technology (Special Issue), 2012, 2016, 2019 - 2020.
18. Egyptian Informatics Journal, 2020.
19. IEEE Transactions on Medical Imaging (TMI), 2020.
20. IEEE Transactions on Multimedia, 2020.

21. International Journal of Computing and Digital Systems (IJCDS), 2020.
22. Journal of Intelligent Systems (JISYS), 2015, 2017 – 2019.
23. Journal of Information Retrieval and Knowledge Management (JIRKM), 2017, 2019.
24. Journal of the Association for Information Science and Technology (JASIST), 2019.
25. Journal of Information System and Technology Management (JISTM), 2017 – 2018.
26. Engineering Science and Technology, an International Journal (JESTECH), 2018.
27. Journal of Information and Communication Technology (JICT), 2017.
28. International Journal of Computer Information Systems and Industrial Management Applications (IJCISIM), 2016.
29. South East Asia Research Centre for Communication and the Humanities (SEARCH) Journal, 2015.

CONFERENCE ORGANISING COMMITTEE

1. **Publication Chairs**, 2026 International Conference on Artificial Intelligence, Digital Media Technology and Social Computing (ICAIDS 2026), organised by Nanchang Hangkong University.
2. **Editor (Multimedia and Information Retrieval)**, 7th International Conference on Interdisciplinary Computer Science and Engineering (ICICSE 2025), organised by FSKTM, UPM.
3. **Publication Chairs**, 2025 International Conference on Artificial Intelligence, Digital Media Technology and Social Computing (ICAIDS 2025).
4. **Conference Co-chairs**, Sixth International Conference on Information Retrieval and Knowledge Management (CAMP'24), organised by PECAMP.
5. **Conference Co-chairs**, 16th IEEE International Conference on Knowledge and System Engineering (KSE 2024), organised by PECAMP.
6. **Technical Program Committee Chair**, Fourth International Conference on Computer Vision, Application and Algorithm (CVAA 2024).
7. **Secretary**, Seminar on Information Retrieval and Knowledge Management 2022 (SIRKM'22), organised by PECAMP and Universiti Kebangsaan Malaysia.

8. **Track Chair (Interactive Digital Media Applications)**, International Conference on Interdisciplinary Computer Science and Engineering (ICICSE 2021), organised by FSKTM, UPM.
9. **Secretary**, Fifth International Conference on Information Retrieval and Knowledge Management (CAMP'21), organised by PECAMP.
10. **Secretary**, Seminar on Information Retrieval and Knowledge Management 2020 (SIRKM'20), organised by PECAMP and Universiti Malaya.
11. **Track Chair (Interactive Digital Media Applications)**, International Conference on Innovations in Computer Science and Engineering (iCiCSE 2020), organised by FSKTM, UPM.
12. **Track Chair (Interactive Digital Media Applications)**, International Conference on Innovations in Computer Science and Engineering (iCiCSE 2019), organised by FSKTM, UPM.
13. **Secretary II**, Fourth International Conference on Information Retrieval and Knowledge Management (CAMP'18), organised by PECAMP.
14. **Track Chair (Multimedia Analytics)**, Seminar on Information Retrieval and Knowledge Management 2017 (SIRKM'17), organised by FSKTM, UPM.
15. **Secretary I**, Third International Conference on Information Retrieval and Knowledge Management (CAMP'16), organised by PECAMP.
16. **Secretariat Committee**, International Conference on Computer Assisted System in Health (CASH 2014), organised by Design for Scientific Renaissance and FSKTM UPM.
17. **Program Exco**, IADIS International Conference on Educational Technologies (ECEduTech 2013), organised by IADIS and FSKTM UPM.
18. **Program Exco**, IADIS Sustainability, Technology and Education (STE 2013), organised by IADIS and FSKTM UPM.
19. **Program Exco**, IADIS International Conference on Internet Technologies & Society (ITS 2013), organised by IADIS and FSKTM UPM.
20. **Secretariat Committee and Master of Ceremony for CAMP'12 Opening event**, International Conference on Information Retrieval and Knowledge Management (CAMP'12), organised by PECAMP and universities around Malaysia.
21. **Secretariat Committee**, Information Technology Colloquium, 2004 (INTEC 2004), organised by FSKTM, UPM.

CONFERENCE TECHNICAL PROGRAMME COMMITTEE (REVIEWER)

Total conference papers reviewed: 153

Total conferences as Technical Committee (reviewer): 89

[List is quite extensive, will be made available upon request].

MEMBERSHIP

1. **Vice President**, Society of Information Retrieval and Knowledge Management (PECAMP) Malaysia, 2025 – 2027.
2. **Associate Member**, Majlis Profesor Negara (MPN), since 2022.
3. **Member**, Kongres Persatuan Akademik Malaysia (MAAC), since 2022.
4. **Professional Technologist**, Malaysia Board of Technologists, since 28 September 2021.
5. **Senior Member**, IEEE, since 2021.
6. **Senior Member**, IEEE Computer Society, since 2021.
7. **Vice President**, Society of Information Retrieval and Knowledge Management (PECAMP) Malaysia, 2023 – 2025.
8. **Member**, MyHCI-UX Kuala Lumpur ACM SIGCHI Chapter, since April 2020.
9. **Member**, The National ICT Association of Malaysia (PIKOM), since April 2018.
10. **Graduate Technologist**, Malaysia Board of Technologists (MBOT), since February 2018.
11. **Member**, Association for Computing Machinery (ACM), since 2014.
12. **Member**, International Association of Computer Science and Information Technology (IACSIT), since 2014.
13. **Member**, Society of Information Retrieval and Knowledge Management (PECAMP) Malaysia, since 2008.
14. **Member**, Persatuan Pegawai Akademik (PPA), since 2004.
15. **Member**, Golden Key International Honour Society, since 2001.
16. **Secretary**, Society of Information Retrieval and Knowledge Management (PECAMP) Malaysia, 2021 – 2023.
17. **Secretary**, Society of Information Retrieval and Knowledge Management (PECAMP) Malaysia, 2019 – 2021.

18. **Secretary**, Society of Information Retrieval and Knowledge Management (PECAMP) Malaysia, 2017 – 2019.
19. **Special Task Officer**, Society of Information Retrieval and Knowledge Management (PECAMP) Malaysia, 2015 – 2017.
20. **Member**, IEEE, 2014 – 2020.

STUDENT DEVELOPMENT ACTIVITIES

1. **Academic Advisor** for Bachelor of Computer Science (Multimedia Computing) with Honours students, since 2021
2. **Academic Advisor** for Bachelor of Computer Science (Multimedia) with Honours students, since 2020.
3. **Academic Advisor** for Bachelor of Computer Science (Multimedia) students, since 2012.
4. **Secretary**, A Day with Academic Advisor, Semester 1 2025/2026, 21 November 2025, PKPP, UPM.
5. **Advisor**, Multimedia Club, FSKTM, UPM, July 2021 – February 2024.
6. **Advisor**, 2024 Chinese New Year Music Video Competition, organised by the Multimedia Club of FSKTM, UPM, 18 December 2023 – 30 March 2024.
7. **Prize Committee Member**, A Day with Academic Advisor, 24 May 2024, FSKTM, UPM.
8. **Advisor**, Multimedia Week, Semester I 202/2023, FSKTM, UPM.
9. **Secretary**, Multimedia Week, Semester II 2018/2019, FSKTM, UPM.
10. **Committee Member**, A Day with Academic Advisor, 16 November 2018, DKAP, UPM.
11. Involvement of SKM4301 students during Academic Visit from Universitas Nasional, Jakarta, Indonesia (UNAS) to FSKTM, UPM, 14 February 2018.
12. **Treasurer**, Multimedia Week, Semester II 2015/2016, FSKTM, UPM.
13. **Secretary**, Multimedia Week, Semester I 2015/2016, FSKTM, UPM.
14. **Secretary**, Multimedia Week, Semester II 2014/2015, FSKTM, UPM.
15. **Session Judge for SKM3200**, Multimedia Week, Semester II 2014/2015, FSKTM, UPM.
16. **Poster Assessor for SIM3202**, HCI Day, Semester II 2014/2015, FSKTM, UPM.

17. **Secretary**, Multimedia Week, Semester I 2014/2015, FSKTM, UPM.
18. **Poster Assessor for SIM3202**, HCI Day, Semester I 2014/2015, FSKTM, UPM.
19. **Secretary**, Multimedia Week, Semester II 2013/2014, FSKTM, UPM.
20. **Session Judge**, Multimedia Week, Semester II 2013/2014, FSKTM, UPM.
21. **Poster Assessor for SIM3202**, HCI Day, Semester I 2013/2014, FSKTM, UPM.
22. **Committee Member**, Information Exchange Programme between UUM and UPM Students, 5 April 2013, UPM.
23. **Ad hoc Committee Member**, An Evening with Academic Advisor, Semester I 2011/2012, FSKTM, UPM.

OTHER INVOLVEMENT

COMMUNITY

1. **Committee Member**, Program Kolaboratif Kuasai A+ Sains Komputer organised by Sekolah Menengah Kebangsaan Taman Jasmin 2, 16 August 2025, FSKTM, UPM.
2. **Committee Member** - Sekolah Menengah Kebangsaan King George V for Digital Storytelling Animation 2022.
3. **Committee Member** - Sekolah Menengah Kebangsaan King George V for Formula 1 in Schools Competition 2022.
4. **Semester Project Advisor** – Nur Izzahtul Nabilah of Maktab Rendah Sains MARA Tun Ghafar Baba for Genius Olympiad 2019 Competition.
5. **Facilitator**, Global I-Lead STEM Camp 1Malaysia 2018 (GISC 2018), 17 – 21 December 2018, UPM.
6. **Mini Project Advisor**, Nobel Laureate's Outreach Camp (NLOC) 2018 – Scientist of Tomorrow, 27 - 30 August 2018, UPM.
7. **Logistic and Safety Committee**, Mobile Application Development Programme for MRSM Kuala Klawang Students, 16 - 17 April 2016, FSKTM, UPM.
8. **Logistic and Safety Committee**, *Liga Remaja Kreatif* Programme, 22 – 24 January 2016, FSKTM, UPM.
9. **Special Task Officer**, Alumni FSKTM, 2014 – 2016.

10. **Head of Logistic**, *Rakan Didik* Programme organised by FSKTM Welfare and Social Club and Islamic Relief Malaysia, 8 – 10 December 2014, FSKTM, UPM.
11. **Secretary**, FSKTM Welfare and Social Club, 2006.
12. **Volunteer**, 12th Paralimpiad Malaysia, 10 - 14 April 2004.
13. **Secretary**, Golden Key International Honour Society (Malaysia), 2003 – 2006.
14. **Member**, Alumni FSKTM, 2010 – present.
15. **Member**, Alumni UPM, 2003 – present.
16. **Member**, Welfare and Social Club, FSKTM, 2003 – present.

SPORTS

1. **Representing Group 3** in Volleyball, UPM Annual Staff Sport Tournament, 30 June – 27 July 2025.
2. **Representing Group 2** in Volleyball, UPM Annual Staff Sport Tournament, 2020.
3. **Representing Group 9** (iDEC & FSKTM) in Volleyball, UPM Inter-PTJ Annual Staff Sport Tournament, 2015.
4. **Representing Group P14** (iDEC & FSKTM) in Volleyball and Bowling, UPM Inter-PTJ Annual Staff Sport Tournament, 2014.
5. **Representing FSKTM** in badminton for UPM Inter-faculty Annual Staff Sport Tournament, 2010 (grouping-level).
6. **Representing FSKTM** in volleyball for UPM Inter-faculty Annual Staff Sport Tournament, 2009 (**Silver Medal**).
7. **Representing UPM** in UTM Volleyball Open Championship, Universiti Teknologi Malaysia, 29 – 30 March 2008 (Quarter-Final).
8. **Representing FSKTM** in 50th Independence Day Marching (UPM level), 2007.
9. **Representing FSKTM** for UPM Inter-faculty Annual Staff Sport Tournament in volleyball (**Gold Medal**), badminton (Quarter-Final), and bowling, 2007.
10. **Representing UPM** in volleyball for 32nd Malaysia Inter-university Annual Staff Sport Tournament, Universiti Malaysia Perlis (UniMAP), 15 - 23 June 2007 (Quarter-Final).
11. **Representing UPM** in volleyball for 31st Malaysia Inter-university Annual Staff Sport Tournament, 27 May - 4 June 2006.

12. **Representing E-Flip cluster** in volleyball, netball, 4x400m and marching competition (**Gold Medal**) for UPM Inter-cluster Annual Staff Sport Tournament, 2005.
13. **Representing UPM** in volleyball for Malaysia Inter-university Annual Staff Sport Tournament, 14 - 21 May 2005.
14. **Representing FSKTM** in volleyball for UPM Inter-faculty Annual Staff Sport Tournament, 2004 (**4th Place**).

REFERENCES

a. Professor Dato' Dr. Shamala K. Subramaniam

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