Ruwan Tennakoon

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CAREER

Senior Lecturer - Artificial Intelligence — **RMIT University**
Jan 2022 – Now — Melbourne, Australia

Lecturer - Artificial Intelligence — **RMIT University**
May 2019 – Dec 2021 — Melbourne, Australia

Research Fellow — **RMIT University**
April 2017 – May 2019 — Melbourne, Australia

Post-Doctoral Researcher — **IBM-Research Australia**
May 2016 – April 2017 — Melbourne, Australia

Research Fellow — **RMIT University**
February 2015 – May 2016 — Melbourne, Australia

PROFESSIONAL EXPERIENCE

Senior Electronics Engineer — **EMDigital (Pvt) Ltd**
June 2009 – Feb 2011 — Colombo, Sri Lanka

Engineer - Access Networks — **Dialog Broadband Networks**
February 2007 – April 2009 — Colombo, Sri Lanka

EDUCATION

Swinburne University of Technology, Melbourne, Australia
PhD (Engineering), Computer Vision, 2011–2015
Thesis: Volumetric Image Analysis: Optical flow, Registration and Segmentation,

University of Peradeniya, Peradeniya, Sri Lanka
BSc (Engineering), Electrical & Electronic Enginerring, 2002–2007 GPA: 3.9/4.0
Results: First Class (Honours)

RESEARCH FUNDING

ARC Linkage Project Grant (CI): Automated Integrity Assessment of Self-Piercing Rivet Joints: i4.0 Approach from 2020 to 2023. $487,419

Cyclotek (Aust) Pty Ltd (Lead CI): Application of AI techniques to PET imaging 2022 to 2025. $140,000

Innovation Connections Grant (Lead CI): Automated inspection system for polypropylene sheet extrusion from 2020 to 2021. $97,436

Defence Science and Technology (DST) (CI): Modelling and Control for Autonomous Underwater Vehicles (AUV's) from 2021 to 2024. $93,000

Defence Science Institute (DSI) Collaborative grant (Lead CI): Capability development for 3D virtual representation of stress visualisation data in geometrically components. from 2021 to 2022. $120,000

PUBLICATIONS

I have [co-]authored 31 peer-reviewed full papers in journals (18) and international conferences (13). These papers are listed below together with book chapters (1) and patents (3).

Journal Articles

[1] Steven Korevaar, Ruwan Tennakoon, Mark Page, Peter Brotchie, John Thangarajah, Cosmin Florescu, Tom Sutherland, Ning Mao Kam, and Alireza Bab-Hadiashar. Incidental detection of prostate cancer with computed tomography scans. *Scientific Reports*, 11(1):1–10, 2021.

[2] Weiqin Chuah, Ruwan Tennakoon, Reza Hoseinnezhad, and Alireza Bab-Hadiashar. Deep learning-based incorporation of planar constraints for robust stereo depth estimation in autonomous vehicle applications. *IEEE Transactions on Intelligent Transportation Systems*, 2021.

[3] Salah Ali, Sherry Mayo, Amirali K Gostar, Ruwan Tennakoon, Alireza Bab-Hadiashar, Thu MCann, Helen Tuhumury, and Jenny Favaro. Automatic segmentation for synchrotron-based imaging of porous bread dough using deep learning approach. *Journal of Synchrotron Radiation*, 28(2), 2021.

[4] Amirali Khodadadian Gostar, Tharindu Rathnayake, Ruwan Tennakoon, Alireza Bab-Hadiashar, Giorgio Battistelli, Luigi Chisci, and Reza Hoseinnezhad. Centralized cooperative sensor fusion for dynamic sensor network with limited field-of-view via labeled multi-bernoulli filter. *IEEE Transactions on Signal Processing*, 69:878–891, 2021.

[5] Sundaram Muthu, Ruwan Tennakoon, Tharindu Rathnayake, Reza Hoseinnezhad, David Suter, and Alireza Bab-Hadiashar. Motion segmentation of rgb-d sequences: Combining semantic and motion information using statistical inference. *IEEE Transactions on Image Processing*, 29:5557–5570, 2020.

[6] Tharindu Rathnayake, Amirali Khodadadian Gostar, Reza Hoseinnezhad, Ruwan Tennakoon, and Alireza Bab-Hadiashar. On-line visual tracking with occlusion handling. *Sensors*, 20(3):929, 2020.

[7] Amirali K Gostar, Tharindu Rathnayake, Ruwan Tennakoon, Alireza Bab-Hadiashar, Giorgio Battistelli, Luigi Chisci, and Reza Hoseinnezhad. Cooperative sensor fusion in centralized sensor networks using cauchy–schwarz divergence. *Signal Processing*, 167:107278, 2020.

[8] Ruwan Tennakoon, Gerda Bortsova, Silas Ørting, Amirali K Gostar, Mathilde MW Wille, Zaigham Saghir, Reza Hoseinnezhad, Marleen de Bruijne, and Alireza Bab-Hadiashar. Classification of volumetric images using multi-instance learning and extreme value theorem. *IEEE Transactions on Medical Imaging*, 39(4):854–865, 2019.

[9] Hrvoje Bogunović, Freerk Venhuizen, Sophie Klimscha, Stefanos Apostolopoulos, Alireza Bab-Hadiashar, Ulas Bagci, Mirza Faisal Beg, Loza Bekalo, Qiang Chen, Carlos Ciller, et al. Retouch: The retinal oct fluid detection and segmentation benchmark and challenge. *IEEE transactions on medical imaging*, 38(8):1858–1874, 2019.

[10] Ayman Mukhaimar, Ruwan Tennakoon, Chow Yin Lai, Reza Hoseinnezhad, and Alireza Bab-Hadiashar. Pl-net3d: Robust 3d object class recognition using geometric models. *IEEE Access*, 7:163757–163766, 2019.

[11] Ammar Mansoor Kamoona, Amirali Khodadadian Gostar, Ruwan Tennakoon, Alireza Bab-Hadiashar, David Accadia, Joshua Thorpe, and Reza Hoseinnezhad. Random finite set-based anomaly detection for safety monitoring in construction sites. *IEEE Access*, 7:105710–105720, 2019.

[12] Amirali Khodadadian Gostar, Chunyun Fu, Weiqin Chuah, Mohammed Imran Hossain, Ruwan Tennakoon, Alireza Bab-Hadiashar, and Reza Hoseinnezhad. State transition for statistical slam using planar features in 3d point clouds. *Sensors*, 19(7):1614, 2019.

[13] Tharindu Rathnayake, Ruwan Tennakoon, Amirali Khodadadian Gostar, Alireza Bab-Hadiashar, and Reza Hoseinnezhad. Information fusion for industrial mobile platform safety via track-before-detect labeled multi-bernoulli filter. *Sensors*, 19(9):2016, 2019.

[14] R. Tennakoon, A. Sadri, R. Hoseinnezhad, and A. Bab-Hadiashar. Effective sampling: Fast segmentation using robust geometric model fitting. *IEEE Transactions on Image Processing*, 27(9):4182–4194, Sept 2018.

[15] Alireza Sadri, Ruwan Tennakoon, Reza Hosseinnezhad, and Alireza Bab-Hadiashar. Robust visual data segmentation: Sampling from distribution of model parameters. *Computer Vision and Image Understanding*, 2018.

[16] Ruwan B Tennakoon, Alireza Bab-Hadiashar, Zhenwei Cao, Reza Hoseinnezhad, and David Suter. Robust model fitting using higher than minimal subset sampling. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 38(2):350–362, 2016.

[17] Ruwan B Tennakoon, Alireza Bab-Hadiashar, Zhenwei Cao, and Marleen de Bruijne. Nonrigid registration of volumetric images using ranked order statistics. *IEEE Transactions on Medical Imaging*, 33(2):422–432, 2014.

[18] Alireza Bab-Hadiashar, Ruwan B Tennakoon, et al. Quantification of smoothing requirement for 3D optic flow calculation of volumetric images. *IEEE Transactions on Image Processing*, 22(6):2128–2137, 2013.

Conference Publications

[1] Ruwan Tennakoon, David Suter, Erchuan Zhang, Tat-Jun Chin, and Alireza Bab-Hadiashar. Consensus maximisation using influences of monotone boolean functions. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, pages 2866–2875, June 2021.

[2] Weiqin Chuah, Ruwan Tennakoon, Reza Hoseinnezhad, and Alireza Bab-Hadiashar. Machine vision-enabled traffic controller for safer and smoother traffic flow around construction sites. In *2019 IEEE Intelligent Transportation Systems Conference (ITSC)*, pages 4255–4260. IEEE, 2019.

[3] Hiqmat Nisa, James A Thom, Vic Ciesielski, and Ruwan Tennakoon. A deep learning approach to handwritten text recognition in the presence of struck-out text. In *2019 International Conference on Image and Vision Computing New Zealand (IVCNZ)*, pages 1–6. IEEE, 2019.

[4] R. Tennakoon, A. K. Gostar, R. Hoseinnezhad, M. De-Bruijne, and A. Bab-Haidashar. Deep multi-instance volumetric image classification with extreme value distributions. In *14th Asian Conference on Computer Vision (ACCV)*, Accepted for publication, December 2018.

[5] R. Tennakoon, A. K. Gostar, R. Hoseinnezhad, and A. Bab-Hadiashar. Retinal fluid segmentation in OCT images using adversarial loss based convolutional neural networks. In *2018 IEEE 15th International Symposium on Biomedical Imaging (ISBI 2018)*, pages 1436–1440, April 2018.

[6] A. K. Gostar, T. Rathnayake, R. Tennakoon, A. Bab-Haidashar, and R. Hoseinnezhad. Non-bayesian track-before-detect using cauchy-schwarz divergence-based information fusion. In *2018 21st International Conference on Information Fusion (FUSION)*, pages 289–294, July 2018.

[7] Pallab Roy, Ruwan Tennakoon, Khoa Cao, Suman Sedai, Dwarikanath Mahapatra, Stefan Maetschke, and Rahil Garnavi. A novel hybrid approach for severity assessment of diabetic retinopathy in colour fundus images. In *IEEE 14th International Symposium on Biomedical Imaging (ISBI 2017)*, pages 1078–1082. IEEE, 2017.

[8] Suman Sedai, Ruwan Tennakoon, Pallab Roy, Khoa Cao, and Rahil Garnavi. Multi-stage segmentation of the fovea in retinal fundus images using fully convolutional neural networks. In *IEEE 14th International Symposium on Biomedical Imaging (ISBI 2017)*, pages 1083–1086. IEEE, 2017.

[9] Tharindu Rathnayake, Reza Hoseinnezhad, Ruwan Tennakoon, and Alireza Bab-Hadiashar. Labeled multi-bernoulli tracking for industrial mobile platform safety.

In *IEEE International Conference on Mechatronics (ICM)*, pages 393–398. IEEE, 2017.

[10] Ruwan Tennakoon, Dwarikanath Mahapatra, Pallab Roy, Suman Sedai, and Rahil Garnavi. Image quality classification for DR screening using convolutional neural networks. In *Third International Workshop on Ophthalmic Medical Image Analysis, Held in Conjunction with MICCAI 2016*, 2016.

[11] Alireza Sadri, Ruwan Tennakoon, Reza Hoseinnezhad, and Alireza Bab-Hadiashar. Mcmc based sampling technique for robust multi-model fitting and visual data segmentation. In *6th International Conference on Image Processing Theory Tools and Applications (IPTA)*, pages 1–6. IEEE, 2016.

[12] Ruwan B Tennakoon, Alireza Bab-Hadiashar, Marleen de Bruijne, and Zhenwei Cao. Efficient nonrigid registration using ranked order statistics. In *IEEE 10th International Symposium on Biomedical Imaging (ISBI)*, pages 496–499. IEEE, 2013.

[13] Ruwan B Tennakoon, Alireza Bab-Hadiashar, David Suter, and Zhenwei Cao. Robust data modelling using thin plate splines. In *International Conference on Digital Image Computing: Techniques and Applications (DICTA)*, pages 1–8. IEEE, 2013.

Patents

[1] Rahil Garnavi, Dwarikanath Mahapatra, Suman Sedai, and Ruwan Tennakoon. Generating an enriched knowledge base from annotated images, United States patent number: US10002311B1, Jun 2018.

[2] Rahil Garnavi, Dwarikanath Mahapatra, Pallab Roy, Suman Sedai, and Ruwan Tennakoon. Classification of severity of pathological condition using hybrid image representation, United States patent number: US10169872B2, Jan 2019.

[3] Rahil Garnavi, Dwarikanath Mahapatra, Pallab Roy, and Ruwan Tennakoon. System and method to teach and evaluate image grading performance using prior learned expert knowledge base, United States patent number: US10984674B2, Apr 2021.

Book Chapters

[1] Ruwan Tennakoon, Alireza Bab-Hadiashar, and Zhenwei Cao. Nonlinear approaches in three dimensional medical image registration. In *Nonlinear Approaches in Engineering Applications*, pages 251–280. Springer, 2015.

Invited Lecturers/Talks

[1] "Incidental detection of prostate cancer with computed tomography scans" at AI Highlights and REF Snapshots session - Aikenhead Centre for Medical Discovery (ACMD) Research Week. 2021.

[2] "Incidental detection of prostate cancer with computed tomography scans" at Victorian Comprehensive Cancer Centre's (VCCC) Monday Lunch Live forum. 2021.

[3] "Data-Efficient ML for CT Image Analysis: Applications in Prostate Cancer and Emphysema Detection" at AI in Helthcare Workshop Series, Centre for Eye Research Australia (CERA). 2021.

TEACHING

Post-graduate level teaching:

[1] Computational Machine Learning (RMIT University) 2019-2021
Lecturer & Course coordinator.

[2] Deep Learning (RMIT University) 2020-Present
Lecturer & Course coordinator. Developed from scratch.

Under-graduate level teaching:

[1] Machine Learning (RMIT University) 2019-2021
Lecturer & Course coordinator.

[2] Advanced Programming Techniques (RMIT University) 2021-2022
Lecturer & Course coordinator.

SUPERVISION

Dr. Alireza Sadri (Associate Supervisor) 2015-2018
Thesis: *Improved Image Analysis by Maximised Statistical Use of Geometry-Shape Constraints.*
Graduate destination: Research Fellow, School of Physics and Astronomy, Monash University.

Dr. Sundaram Muthu (Associate Supervisor) 2018-2022
Thesis:*Identification of moving objects in complex dynamic scenes using semantics.*
Graduate destination: Postdoctoral Research Fellow - CSIRO.

Wei Qin Chuah (Associate Supervisor) 2019-Present
Thesis: *Time Progressive Multistructural Visual Data Segmentation.*

Steven Korevaar (Associate Supervisor) 2020-Present
Thesis: *Domain generalization for medical image analysis.*

AWARDS & SCHOLARSHIPS

[1] Invention Achievement Award - IBM Research Australia, 2017.

[2] Mangers choice of the year award - IBM Research Australia, 2016.

[3] Competitive award for conference attendance, Faculty of Engineering and Industrial Sciences, Swinburne University of Technology to attend the 10th International Symposium on in Biomedical Imaging, San Francisco USA - 2013.

[4] Swinburne University Postgraduate Research Award (SUPRA) - 2011 to 2014.

[5] Swinburne University tuition fee scholarship - 2011 to 2014.

PROFESSIONAL ACTIVITIES

Program Committee member at international conferences

[1] Awards/Promotion chair (VIC): Digital Image Computing: Techniques & Applications (DICTA), 2020.

Reviewer for international journals

[1] IEEE Transaction on Medical Imaging (TMI).

[2] IEEE Transaction on Image Processing (TIP).

[3] IEEE Transactions on Neural Networks and Learning Systems (TNNLS).

[4] IEEE Transactions on Intelligent Transportation Systems (T-ITS).

[5] IEEE Access