Sunil Aryal, PhD, FHEA

Senior Lecturer in Data Science (full-time continuing since January 2019)
School of Information Technology, Faculty of Science, Engineering & Built Environment
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Summary

Research

- Investigator in 11 external research grants with a total funding of over AUD 4 million, three grants from US and Australian Defence and Intelligence agencies with total funding over AUD 0.5 million as the lead CI
- Supervised 1 PhD thesis and 12 master's major/minor theses to completion, currently supervising 2 research fellows, 8 HDR students and two research assistants
- Received Deakin School of IT Research Award for Industry Engagement (2022) and for Excellence in Early Career Research Performance (2021)
- Visited US Air Force Office of Scientific Research (AFOSR) research labs in Viriginia USA on an invited fully funded research collaboration visit (2022) and working very closely with them since then

Teaching

- 10 years of experience in teaching at tertiary levels in Australia
- Successfully (re)developed and coordinated/chaired several large units and championing effective teaching in the school in terms of student engagement and support
- Received a Deakin University Faculty of Science, Engineering and Built Environment Learning and Teaching Award (2022) and a School of Information Technology Learning and Teaching Award (2021)
- Mentored 6 final year capstone project teams.

Leadership

- Leading Deakin School of IT Industry Research in AI and Machine Leaning as an Industry Practice Lead
- Co-leading the Machine Learning for Decision Support (MLDS) research group at Deakin University School of Information Technology, Waurn Ponds Campus
- Providing academic leadership in the Deakin School of IT as a member of the School Learning and Teaching Executive Committee and the Director of the Graduate Certificate of IT course
- Led the Bachelor of Information Technology course at Deakin School of IT as a Co-Deputy course Director

1. Research Interests

Data Mining (DM), Machine Learning (ML) and Artificial Intelligence (AI) and their applications in domains such as Defence, National Intelligence, Cybersecurity, Advanced Manufacturing, and Healthcare, particularly in making DM/ML/AI algorithms flexible, robust, and interpretable/explainable to use in real-world problems

2. Teaching

Databases, Data Analytics and Machine Learning, Programming, System Analysis and Design, Software Engineering, Project Management, Business Information System, IT Placement, Research & Development in IT, Professional Skills in IT, Capstone Projects, and Coursework Research

3. Appointments Held

2016-18   *Lecturer (full-time)*, Federation University, Mt Helen, Australia
2013-15   *Lecturer (sessional)*, ATMC (Federation University), Melbourne, Australia
2014-15   *Data Engineer (part-time)*, Gyde Inc., Melbourne, Australia
2014-15   *Teaching Associate (sessional)*, Monash University, Clayton, Australia
2014-15   *Research Assistant (casual)*, Federation University, Churchill, Australia

2013-13	*Software Developer (casual)*, Monash University, Clayton, Australia
2012-13	*Research Assistant (casual)*, Monash University, Churchill, Australia
2009-10	*Research Trainee (full-time)*, Katholieke University, Leuven, Belgium
2008-09	*Software Developer (full-time)*, Ingenico Asia Pacific, Sydney, Australia
2006-06	*IT Officer (full-time)*, Nepal Bank Limited, Damauli, Nepal
2002-05	*Computer Teacher (full-time)*, Kathmandu Don Bosco School, Kathmandu, Nepal

4. Education

2020	*Grad. Cert. in Higher Education Learning & Teaching*, Deakin University, Australia
2017	*PhD (Computer Science)*, Monash University, Australia
2012	*Master of IT (Research)*, Monash University, Australia
2008	*Master of IT (Coursework)*, University of Southern Queensland, Australia
2005	*Bachelor in IT*, Purbanchal University, Nepal

5. Research Grants

External – over $4 million (over $0.5 million as the lead-CI)

2023-26   A/Prof Julianne Lynch, A/Prof Andrew Cain, Dr Jo Raphael, Dr George Aranda, **Dr Sunil Aryal**, Dr Chathu Ranaweera, Dr Carly Sawatzki, Dr Matthew Thomas, Dr Guy Wood-Bradley, A/Prof Glenn Auld, Dr John Cripps Clark and A/Prof Linda Hobbs, "Design and delivery of a Graduate Certificate of Secondary Digital Technologies"**,** *DETVic Research Grant, Department of Education and Training, State Government of Victoria, Australia*, $1,112,571 [Deakin University]

2023-26   Dr Mohamed Reda Bouadjenek, **Dr Sunil Aryal** and Dr Muna Al-Hawawreh, "Contributions to Edge and Multimodal Machine Learning"*, International Partnership Grant, Technology Innovation Institute (TII), UAE*, $560,000 (US$360,000 [Deakin University]

2023-25   **Dr Sunil Aryal** and Dr Mohamed Reda Bouadjenek, "Machine Learning in Heterogeneous Data from Multiple Sources", *Basic Science Research grant, US Air Force Office of Scientific Research (AFOSR) USA*, $330,000 (US$225,000) [Deakin University] – One of the two projects selected to be funded outside of the US in the AFOSR Director's Research Initiative 2022.

2022   Prof Richard Dazeley, **Dr Sunil Aryal**, Dr Bahadorreza Ofoghi and Prof John Yearwood, "Application of Generic Actual Argument Model to represent complex decisions and generate narratives"*, AI for Decision Making Initiative grant - Round 3, Defence Science Technology (DST) Group Australia*, $30,000 [Deakin University]

2022   **Dr Sunil Aryal**, *Window On Science (WOS) Travel grant, US Air Force Office of Scientific Research (AFOSR)*, US$6,800 [Deakin University] - visited US Space and Air Force Research labs in Virginia USA for research collaboration and currently working with them.

2021   Dr Imran Razzak, Dr Mohamed Reda Bouadjenek and **Dr Sunil Aryal***, "Utilizing Extractive - Abstractive Summarization for Understanding the Narrative of Social Media Users from Multimodal Data"*, AI for Decision Making Initiative grant – Round 2, Office of National Intelligence (ONI) Australia*, $20,000 [Deakin University]

2020-23   **Dr Sunil Aryal**, "Developing robust framework for practical data mining", *Basic Science Research grant, US Air Force Office of Scientific Research (AFOSR) Asian Office of Aerospace Research and Development (AOARD) and Office of Naval Research (ONR) Global*, $216,000 (US$150,000), [Deakin University]

2020-22   Prof Richard Dazeley, Prof Cindy Bethel, **Dr Sunil Aryal**, A/Prof Tim Wilkin, Prof Peter Vamplew and Dr Cameron Foale, "A competency-aware multi-agent framework for human-machine teams in adversarial environments"*, AFOSR-DST Australia Autonomy Initiative grant, US Air Force Office of Scientific Research (AFOSR) and Defence Science Technology (DST) Group Australia*, $373,199, [Deakin University] - initiated and coordinated the grant application in terms of assembling AUS-US team involving three universities and preparing research proposal. I suggested Prof Dazeley to lead the AUS team as the US team was led by a full professor.

2020-21   Prof Richard Dazeley, Prof Peter Vamplew, **Dr Sunil Aryal** and Dr Cameron Foale, "Modeling

Adversary Intent Using Multiobjective Reinforcement Learning", *Operation Research Network (ORNet) grant, Defence Science Technology (DST) Group Australia*, $97,000 [Deakin University]

2020   **Dr Sunil Aryal**, "Ensemble Learning for Outlier Detection", *AI for Decision Making Initiative grant – Round 1, Office of National Intelligence (ONI) Australia*, $20,000 [Deakin University]

2019-21   Dr Stephen Carbone, Prof Britt Klein, Dr Lisa Clinnick, Dr Lachlan Kent, Mr Asher Leslie, Prof Manzur Murshed, Prof Peter Vamplew, Prof Madhu Chetty, Mr Samia Toukhsati, Dr Cameron Foale, Prof Suzanne McLaren, Dr Mandy Cassimatis, **Dr Sunil Aryal** and Dr Susan Stacpoole, "Wellbeing Track & Change: Using digital monitoring to improve the mental wellbeing of residential aged care workers", *WorkSafe Research grant, WorkWell Improvement Fund Round 2, Worksafe Victoria*, $1,303,141 [Federation University]

Internal - $72,000 ($40,000 as the lead CI)

2022   Dr Mohamed Reda Bouadjenek, **Dr Sunil Aryal** and Prof Philip Dawson, "Cold-start Contract Cheating Identification from Side Information Using Latent Linear Writing Style Representation", *Interdisciplinary Project Incubator Grant, Deakin Science and Society Network*, $12,000 [Deakin University]

2022   **Dr Sunil Aryal**, Dr Michael Hobbs, A/Prof Andrew Cain, A/Prof Kevin Lee, Mr Maksym Slavenko, "Creating a course-wide case study incorporating software-based learning infrastructure to facilitate authentic experiences and enhance learning outcomes for students in the Graduate Certificate of Information Technology", *Deakin Design Seeding Grant, Deakin Learning Futures Deakin University*, $10,000 [Deakin University]

2021   **Dr Sunil Aryal**, "Efficient outlying aspect mining in data with mixed attributes", *Early Career Researcher small grant, School of Information Technology, Deakin University*, $10,000 [Lead Inspiration, Deakin University]

2021   Dr Mohamed Reda Bouadjenek, Dr Imran Razzak, **Dr Sunil Aryal**, "Explainable NLP model", *Program Initialization grant, School of Information Technology, Deakin University*, $20,000, [Deakin University]

2021   **Dr Sunil Aryal**, *Peer-Reviewed ECR Support Scheme (PRESS2021) grant*, *Faculty of Science, Engineering and Built Environment (SEBE), Deakin University*, $5,000 [Deakin University]

2020   **Dr Sunil Aryal**, *Peer-Reviewed ECR Support Scheme (PRESS2020) grant*, *Faculty of Science, Engineering and Built Environment (SEBE), Deakin University*, $5,000 [Deakin University]

2019   **Dr Sunil Aryal**, *ECR startup grant*, *School of IT, Deakin University* - $10,000 [Deakin University]

6. Academic Leadership & Service

Research leadership and service

- *Co-Leader*, *Machine Learning for Decision Support (MLDS) Research Group*, Deakin School of IT
  - leading a group of three academic staff, 2 research fellow/assistant, 8 HDR students; five more HDR students and one part-time (0.5) research fellow for three years commencing soon.
  - secured over $1 million of research funding in external grants for the group
  - mentored my co-lead to secure a research grant of over $0.5 million from an international agency.

- *Industry Practice Lead (Machine Learning)*, Deakin University, School of IT (2022-now)
  - helping and encouraging colleagues in the school, particularly EMCRs, to engage with industry partners
  - played significant role to motivate EMCRs to apply for recent AI for Decision Making Initiatives (AI4DMI) 2022 call, five (four led by EMCRs) out of 11 proposals submitted were funded

- *Taskforce Member, Deakin School of IT Research Centre Restructure Taskforce and HDR Experience Improvement Taskforce (2021-now)*
  - proposed a research structure that is centered around supporting EMCRs and PhD students that the School is considering to implement
  - helped to develop a process to engage HDR students more in the school activities and a well-defined guidelines to rank HDR scholarship applications in the school

- *ECR Representative, Research Committee, Federation University, School of Science, Eng & IT (2018)*
  - advocated strongly for more support to ECRs and managed to change the school's HDR supervision policy to ensure at least one ECR co-supervisor in all university/school funded HDR scholarships.

Teaching leadership and service

- *Course Director*, Graduate Certificate in IT, Deakin University, School of IT (2022-now)
  - managing the course and currently leading the course major development to better align the four units
  - led a successful Transformation Deakin Design Seeding Grant application ($10K) from Deakin Learning Futures to develop a common platform to use all four units in the course
  - do recognition of prior learning (RPL) and entry requirement assessment for non-traditional pathways
- *Member, Deakin University School of IT Learning and Teaching Executive team (2022-now)*
  - contributing to shaping up school's L&T strategies and priorities, particularly for large first year units, aligned delivery and active learning units.
  - championing effective teaching and supporting new and early career colleagues in teaching
- *Member, Bachelor of Data Science course team (2023-now)*
  - contributing to the management of the course and associated units
- *Member, Master of Applied Artificial Intelligence course team (2023-now)*
  - contributing to the management of the course and associated units
- *Co-Deputy Director, Bachelor of IT, Deakin University, School of IT (2020-2021)*
  - played instrumental role in the design of new BIT course, particularly in designing majors and minors, establishing a core unit on System Requirement Analysis, integrating WIL in units, and redevelopment of professional practice and placement units
  - did RPL and entry requirement assessment
  - acknowledging my contribution and leadership skills, I was given a course director role in 2022
- *Member, Course Leadership Team, Master of IT, Deakin University, School of IT (2019)*
  - contributed significantly to the MIT major course revision in 2019
  - did RPL and entry requirement assessment
  - acknowledging my contribution, I was given a Deputy Director of BIT (the largest UG course in the school) the following year.
- *Unit Coordinator/Chair, Deakin University School of IT and Federation University School of Science, Engineering, and IT (2016-now)*
  - successfully coordinating/chairing several IT/IS units in UG/PG levels, many of them are large core units with up to 650+ students and teaching teams with two academic staffs and up to 7 sessional tutors.
  - redeveloped two database units (SIT103 and SIT772) at Deakin university that had been problematic for several years in terms of students' engagement and satisfaction in 2021 and 2022 and transformed it into an exemplary ones with one of the best units in the school in terms of student satisfaction
  - redeveloped PG Capstone project units at Federation University (2017-2018) where ACS accreditation panel raised concerns about quality/consistency of delivery/assessment across multiple campuses

Other academic service and leadership

- *Co-organizer*, Annual Simpson's AI Challenge, Deakin University, School of IT (2021-now)
  - organized two very successful competitions with good participations from UG and PG students, successful applied for grants from Bendigo Community Bank for prize money in both years.
- Represented Deakin School of IT at Geelong Think Tank (Victorian Government's Initiatives to understand digital capabilities and skills demand/supply in the region) and established relationships with local employers that resulted in multiple internship opportunities for our Geelong campus students (2021).
- Regularly serve on Faculty Academic Integrity Hearing and School HDR Confirmation Panels (2019-now)

7. Awards and Scholarships

As an academic/researcher

2023   Nominated by the Deakin School of IT and Faculty of SEBE for a *Victorian Tall Poppy Award*

2022   *School Research Award for Industry Engagement*, School of IT, Deakin University

2022   *Faculty Teaching and Learning Award*, Faculty of SEBE, Deakin University

2022   Nominated by the Faculty of SEBE, Deakin University for the *David and Valerie Solomon Award* that is awarded to an emerging young researcher/scientist.

2021   *School Research Award for Excellence in Early Career Research Performance*, School of IT,

Deakin University

2021   *School Teaching Award for Excellence in Unit Leadership and Supporting Student Learning,* School of IT, Deakin University

2015   Nominated by students for a *Monash University Faculty of IT Teaching Award*

As a student

2015   *Student travel award* ($2,000) from Asian Information Retrieval Society (AIRS) and Monash Institute of Graduate Research (MIGR) to attend AIRS conference in Brisbane, Australia

2014   *Student travel award* ($3,500) from Alberta Innovates Centre for Machine Learning (AICML) and Monash Institute of Graduate Research (MIGR) to attend IEEE ICDM in Shenzhen, China

2013   *Australian Postgraduate Award (APA)* for PhD at Monash University

2012   *Best Poster Award* at the Faculty of IT higher degrees by research conference, Monash University

2012   *Monash Postgraduate Publication Award (PPA)*, Faculty of IT, Monash University

2012   *Research student stipend* for MIT (Research), Monash University, Gippsland

2009   *Research trainee scholarship* by Katholieke University Leuven, Belgium

2007   *Dean's award* for outstanding academic achievement by University of Southern Queensland

2007-08   *Academic scholarships* during MIT (Coursework) study at University of Southern Queensland

2006   *ISACA prize* by Information Systems Audit and Control Association (ISACA) Brisbane Chapter

2001-05   *Outstanding student full tuition fee waiver scholarship* to study BIT

8. Professional Affiliation & Service

- *Fellow of the UK AdvanceHE*, formerly known as Higher Education Academy (HEA) (2021-now)
  - did it through the reflective practice pathway
- *Topic Editor* for the MDPI Applied System Innovation (ASI) journal (2021-now)
- *Machine Learning Expert*, Critical Minerals Consortium led by Monash University (2021-Now)
- *Panel of Experts (IT and Higher Education in Engineering/Technology),* Nepal Policy Institute (2021-now)
- *Track Co-Chair* (Artificial Intelligence and Cognitive Systems) – Arab Computer Society and IEEE International Conference on Computer Systems and Application (AICCSA) (2022)
- *Workshop Co-Chair*, Int. Conf. on Advanced Data Mining and Applications (ADMA) (2021)
- *Grant Reviewer (**Detailed Assessor**)*, Australian Research Council (2023-now)
- *PC Member* - Conferences like IJCAI, AAAI, ECML/PKDD, PAKDD, ECAI, IJCNN, ICONIP (2019-now)
- *Journal Reviewer* - ACM Transactions on Knowledge Discovery from Data (TKDD), Journal of AI Research (JAIR), IEEE Intelligent Systems, IEEE Transaction on AI (2020-now)
- *Professional Member*, Australian Computer Society (2008-now)
- *Professional Member*, IEEE Computer Society (2014-now)
- *Professional Member*, IEEE Young Professionals (2014-now)
- *Treasurer*, IEEE Computational Intelligence Society (IEEE-CIS) Victoria Chapter (2018-2019)

9. Publications

Peer-reviewed Journal Articles = 23 (20 in Scimago Q1 journals)

Peer-reviewed Conference papers = 24 (14 in CORE A/A* ranked conferences)

Peer-reviewed Book Chapters = 2

Preprint Articles = 5

Google Scholar Citations = 543, h-index = 13 and i10-index = 20 (as of 29 March 2023)

Field-Weighted Citation Impact = 1.58 (last three years=1.96, last five years=1.79)

Refereed Journal Articles

1. Baniya, A. A., Lee, T. K., Eklund, P. W. and **Aryal, S.** (2023). Omnidirectional video super-resolution using deep learning, *IEEE Transactions on Multimedia*, [Q1, IF: 8.18] (Accepted on 09 April 2023)

2. Samariya, D., Ma, J., **Aryal, S.** and Zhao, X. (2023). Detection and explanation of anomalies in healthcare data, *Health Information Science and Systems,* doi: 10.1007/s13755-023-00221-2 [Q1]

3. Rasool, Z.*, **Aryal, S.**, Bouadjenek, M. R. & Dazeley, R. (2023). Overcoming Weaknesses of Density Peak Clustering Using a Data-dependent Similarity Measure, *Pattern Recognition*, doi: 10.1016/j.patcog.2022.109287 [Q1, IF: 8.52] (*Contributed equally)

4. Halder, R. K., Uddin, M. N., Uddin, M. A., **Aryal, S.**, Islam, M. A., Hossain, F., Jahan, N., Khraisat, A. & Alazab, A. (2023). A Grid Search-Based Multilayer Dynamic Ensemble System to Identify DNA N4-Methylcytosine Using Deep Learning Approach, *Genes*, 14(3), Art. No. 582, doi: 10.3390/genes14030582 [Q2, IF: 4.47]

5. Santosh, K. C., Rasmussen, N., Mamun, M. & **Aryal, S.** (2022). A systematic review on cough sound analysis for Covid-19 diagnosis and screening: is my cough sound COVID-19? *PeerJ Computer Science,* 8, doi: 10.7717/peerj-cs.958 [Q1, IF: 2.41]

6. Nguyen, T. T., Abdelrazek, M., Nguyen, D. T., **Aryal, S.**, Nguyen, D. T., Reddy, S., Nguyen, Q. V., Khatami, A., Nguyen, T. T., Hsu, E. B. & Yang, S. (2022). Origin of Novel Coronavirus causing COVID-19: A Computational Biology Study using Artificial Intelligence. *Machine Learning with Applications*, 9, Art. No. 100328. doi: 10.1016/j.mlwa.2022.100328 [Q1, IF: 6.3]

7. Aryal, J., Sitaula, C. & **Aryal, S**. (2022). NDVI Threshold-based Urban Green Space Mapping from Sentinel-2A at the Local Government Area (LGA) level of Victoria, Australia. *Land*, 11 (3), Art. No. 351. doi: 10.3390/land11030351 [Q2, IF: 3.40]

8. Sitaula, C., Shahi, T. B., **Aryal, S**., Marzbanrad, F. (2021). Fusion of multi-scale bag of deep visual words features of chest X-ray images to detect COVID-19 infection. *Scientific Report*, 11, Art. No. 23914. doi: 10.1038/s41598-021-03287-8 [Q1, IF: 5.13]

9. Sitaula, C., **Aryal, S.**, Xiang, Y., Baset, A. & Lu, X. (2021). Content and context features for scene image representation. *Knowledge-Based Systems*, *232*, 1-10. doi: 10.1016/j.knosys.2021.107470 [Q1, IF: 8.04]

10. Song, X., **Aryal, S.**, Ting, K. M., Liu, Z. & He, B. (2021). Spectral-Spatial Anomaly Detection of Hyperspectral Data Based on Improved Isolation Forest. *IEEE Transactions on Geoscience and Remote Sensing*, doi:10.1109/TGRS.2021.3104998 (Published online on 24 Aug 2021) [Q1, IF: 5.6]

11. Sitaula, C., Xiang, Y., **Aryal, S.**, & Lu, X. (2021). Scene image representation by foreground, background, and hybrid features. *Expert Systems with Applications*, *182*, 1-10. doi:10.1016/j.eswa.2021.115285 [Q1, IF: 6.95]

12. Sitaula, C., & **Aryal, S.** (2021). New bag of deep visual words based features to classify chest x-ray images for COVID-19 diagnosis. *Health Information Science and Systems*, *9*(1), 1-12. doi:10.1007/s13755-021-00152-w [Q1]

13. Sitaula, C., Basnet, A., & **Aryal, S.** (2021). Vector representation based on a supervised codebook for Nepali documents classification. *PeerJ Computer Science*, *7*, 1-18. doi:10.7717/peerj-cs.412 [Q1, IF: 1.89]

14. Dazeley, R., Vamplew, P., Foale, C., Young, C., **Aryal, S.**, & Cruz, F. (2021). Levels of explainable artificial intelligence for human-aligned conversational explanations. *Artificial Intelligence*, *299*, 1-29. doi:10.1016/j.artint.2021.103525 [Q1, IF: 9.08]

15. **Aryal, S.**, Santosh, K. C., & Dazeley, R. (2021). usfAD: a robust anomaly detector based on unsupervised stochastic forest. *International Journal of Machine Learning and Cybernetics*, 12(4), 1137-1150 doi:10.1007/s13042-020-01225-0 [Q1, IF: 4.01]

16. Wells, J. R., **Aryal, S.**, & Ting, K. M. (2020). Simple supervised dissimilarity measure: Bolstering iForest-induced similarity with class information without learning. *Knowledge and Information Systems*, *62*(8), 3203-3216. doi:10.1007/s10115-020-01454-3 [Q1, IF: 3.16]

17. Sitaula, C., & **Aryal, S.** (2020). Fusion of whole and part features for the classification of histopathological image of breast tissue. *Health Information Science and Systems*, *8*, 1-12. doi:10.1007/s13755-020-00131-7 [Q1]

18. **Aryal, S.**, Ting, K. M., Washio, T., & Haffari, G. (2020). A comparative study of data-dependent approaches without learning in measuring similarities of data objects. *Data mining and Knowledge Discovery*, *34*, 124-162. doi:10.1007/s10618-019-00660-0 [Q1, IF: 4.42]

19. Sitaula, C., Xiang, Y., Zhang, Y., Lu, X., & **Aryal, S.** (2019). Indoor image representation by high-level semantic features. *IEEE Access*, *7*, 84967-84979. doi:10.1109/ACCESS.2019.2925002 [Q1, IF: 3.37]

20. Ting, K. M., Washio, T., Wells, J. R., & **Aryal, S.** (2017). Defying the gravity of learning curve: a characteristic of nearest neighbour anomaly detectors. *Machine Learning*, *106*(1), 55-91. doi:10.1007/s10994-016-5586-4 [Q1, IF: 3.69]

21. **Aryal, S.**, Ting, K. M., Washio, T., & Haffari, G. (2017). Data-dependent dissimilarity measure: an effective alternative to geometric distance measures. *Knowledge and Information Systems*, *53*(2), 479-506. doi:10.1007/s10115-017-1046-0 [Q1, IF: 3.16]

22. **Aryal, S.**, & Ting, K. M. (2016). A generic ensemble approach to estimate multidimensional likelihood in Bayesian classifier learning. *Computational Intelligence*, *32*(3), 458-479. doi:10.1111/coin.12063 [Q2, IF: 2.33]

23. Ting, K. M., Washio, T., Wells, J. R., Liu, F. T., & **Aryal, S.** (2013). DEMass: a new density estimator for big data. *Knowledge and Information Systems*, *35*(3), 493-524. doi:10.1007/s10115-013-0612-3 [Q1, IF: 3.16]

Refereed Conference Proceedings

24. Ly, A., Dazeley, R., Vamplew, P., Naranjo, F. C. and **Aryal, S.** (2023). Elastic Step DDPG: A Novel Multi-Step Algorithm to Improve Sample Efficiency in Deep Deterministic Policy Gradient. *In IJCNN 2023: Proceedings of the International Joint Conference on Neural Networks* [CORE A] (Accepted on 08 April 2023)

25. Malgi, V. V.*, Aryal, S.*, Rasool, Z. and Tay, D. (2023). Data-dependent and scale-invariant kernel for Support Vector Machine classification. *In PAKDD 2023: Proceedings of the 27th Pacific-Asia Conference on Knowledge Discovery and Data Mining* [CORE A] (*Contributed equally) (Accepted on 22 February 2023)

26. Imran, Z., Grooby, E., Malgi, V., Sitaula, C., **Aryal, S.** and Marzbanrad, F. (2022). A Fusion of Handcrafted Feature-Based and Deep Learning Classifiers for Heart Murmur Detection. *In CinC 2022: Proceedings of the 49th Conference on Computing in Cardiology* (pp. 1-4) doi: 10.22489/CinC.2022.310 (*Third place winner in the outcomes category of the George B. Moody PhysioNet 2022 Challenge*)

27. Samariya, D., Ma, J. and **Aryal, S.** (2022). sGrid++: Revising Simple Grid based Density Estimator for Mining Outlying Aspect. *In WISE 2022: Proceedings of the International Conference on Web Information Systems Engineering* (pp. 194-208) doi: 10.1007/978-3-031-20891-1_15 [CORE A]

28. Baniya, A. A., Lee, A-K., Eklund, P. W. & **Aryal, S.** (2022). STIFS: Spatio-Temporal Input Frame Selection for Learning-based Video Super-Resolution Models. In *SIGMAP 2022: Proceeding of the International Conference on Signal Processing and Multimedia Applications* (pp. 48-58) doi: 10.5220/0011339900003289

29. **Aryal, S.**, & Wells, J. R., (2021). Ensemble of Local Decision Trees for Anomaly Detection in Mixed Data. In *ECML PKDD 2021: Proceedings of the 2021 European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases* (pp. 1-16). Springer. doi: 10.1007/978-3-030-86486-6_42 [CORE A]

30. **Aryal, S.**, Baniya, A. A., Razzak, I., & Santosh, K. C. (2021). SPAD+: An Improved Probabilistic Anomaly Detector based on One-dimensional Histograms. In *IJCNN 2021: Proceedings of the 2021 International Joint Conference on Neural Networks* (pp. 1-7). Piscataway, N.J.: Institute of Electrical and Electronics Engineers. doi: 10.1109/IJCNN52387.2021.9534162 [CORE A]

31. Sitaula, C., Xiang, Y., Basnet, A., **Aryal, S.**, & Lu, X. (2020). HDF: Hybrid deep features for scene image representation. In *IJCNN 2020: Proceedings of the 2020 International Joint Conference on Neural Networks* (pp. 1-8). Piscataway, N.J.: Institute of Electrical and Electronics Engineers. doi:10.1109/ijcnn48605.2020.9207106 [CORE A]

32. Samariya, D., **Aryal, S.**, Ting, K. M., & Ma, J. (2020). A New Effective and Efficient Measure for Outlying Aspect Mining. In *WISE 2020: Proceedings of the 2020 International Conference on Web Information Systems Engineering* Vol. 12343 (pp. 463-474). Berlin, Germany: Springer. doi:10.1007/978-3-030-62008-0_32 [CORE A]

33. Sitaula, C., Xiang, Y., **Aryal, S.**, & Lu, X. (2019). Unsupervised deep features for privacy image classification. In *PSIVT 2019: Proceedings of the 2019 Pacific-Rim Symposium on Image and video technology* Vol. 11854 (pp. 404-415). Cham, Switzerland: Springer. doi:10.1007/978-3-030-34879-3_31 [CORE B]

34. Sitaula, C., Xiang, Y., Basnet, A., **Aryal, S.**, & Lu, X. (2019). Tag-based semantic features for scene image classification. In *ICONIP 2019: Proceedings of the 26th International Conference on Neural Information Processing of the Asia-Pacific Neural Network Society 2019* Vol. 11955 (pp. 90-102). Cham, Switzerland: Springer. doi:10.1007/978-3-030-36718-3_8 [CORE A]

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