# PALAMANDADIGE BASURA CHINATH FERNANDO

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**Objective**

Influential industrial innovation and next generation cutting-edge research in Computer Vision and Machine Learning. To solve computational human behavior understanding problem in next 30 years.

**Current Position**

- Research Fellow at the Australian Nationality University Canberra and a researcher at the Australian Research Councils Centre of Excellence Robotic Vision.
- Project leader for SR1: "Understanding Human and Robot Actions and Interactions" at the Australian Research Councils Centre of Excellence Robotic Vision.

**Education**

- 2011 - 2015 : Ph.D Doctor in Electrical Engineering. PSI-VISICS, Electrical Engineering Dept, KU Leuven, Belgium (Supervisor Prof. Tinne Tuytelaars).
- 2009 - 2011 : M.Sc. Colour In Informatics and Media Technology, European Master,University Jean Monnet, Saint-Etienne, France.
- 2003 2007 : B.Sc. (Hons), Computer Science and Engineering, University of Moratuwa, Sri Lanka.

**Work Experience**

- Research Fellow, The ARC Centre of Excellence Robotic Vision, The Australian National University, Australia - July-2015 to now.
- Research Assistant, Electrical Engineering Dept. (ESAT), KU Leuven, Belgium - Oct-2011 to March-2015.
- Intern at Laboratoire Hubert Curien, UMR CNRS, Saint-Etienne, France - Jan-2011 to June-2011.
- Senior Software Engineer, John Keells Computer Services, Colombo, Sri Lanka - Sept-2008 to July-2009.
- Senior Software Engineer, Virtusa, Colombo, Sri Lanka - Apr-2008 to Sept-2008.
- Software Engineer, Virtusa, Colombo, Sri Lanka - Sept-2007 to Sept-2008.
- Software Intern, Virtusa, Colombo, Sri Lanka - 2006.

**Publications**

**Book chapters**

1. Fernando, B.; Aljundi, R.; Emonet, R.; Habrard, A.; Sebban, M. & Tuytelaars, T. (2017), Unsupervised Domain Adaptation based on Subspace Alignment, Editors: Csurka, G.; Domain Adaptation in Computer Vision Applications; Springer International Publishing.

**Journals : 3 IJCV, 3 TPAMI, 1 PR, 1 PRL, 1 CVIU, 1 IOVS**

1. Fernando, B. & Gould, S. (2017), 'Discriminatively Learned Hierarchical Rank Pooling Networks', International Journal of Computer Vision (**IJCV**) xxx(x), 1–21 (accepted)- DOI. 10.1007/s11263-017-1030-x .
2. Fernando, B.; Gavves, E.; Oramas, J.; Ghodrati, A. & Tuytelaars, T. (2016), 'Rank Pooling for Action Recognition', IEEE Transactions on Pattern Analysis and Machine Intelligence SI:CVPR15(1) **TPAMI**, 1-14.

3. Saha, S. K., Xiao, D., Fernando, B., Tay-Kearney, M. L., An, D., & Kanagasingam, Y. (2017). Deep Learning Based Decision Support System for Automated Diagnosis of Age-related Macular Degeneration (AMD). Investigative Ophthalmology & Visual Science, 58(8), 25-25. *[**Impact Factor: 3.303** ]*
4. Fernando, B.; Tommasi, T. & Tuytelaars, T. (2015), 'Location recognition over large time lags', Computer Vision and Image Understanding (**CVIU**) 139, 21–28.
5. Fernando, B.; Tommasi, T. & Tuytelaars, T. (2015), 'Joint cross-domain classification and subspace learning for unsupervised adaptation', **Pattern Recognition Letters** 65, 60–66.
6. Fernando, B.; Fromont, E. & Tuytelaars, T. (2014), 'Mining mid-level features for image classification', International Journal of Computer Vision (**IJCV**) 108(3), 186–203.
7. Gavves, E.; Fernando, B.; Snoek, C. G.; Smeulders, A. W. & Tuytelaars, T. (2014), 'Local alignments for fine-grained categorization', International Journal of Computer Vision (**IJCV**) 111(2), 191–212.
8. Fernando, B.; Fromont, E.; Muselet, D. & Sebban, M. (2012), 'Supervised learning of Gaussian mixture models for visual vocabulary generation', **Pattern Recognition** 45(2), 897–907.
9. Bilen, H.; Fernando, B.; Gavves, E. & Vedaldi, A. (2017), Action Recognition with Dynamic Image Networks, IEEE Transactions on Pattern Analysis and Machine Intelligence (Under review - revision) **TPAMI**, 1-14.
10. Harandi, M. & Fernando, B. (2017), Generalized BackPropagation, Etude De Cas: Orthogonality, IEEE Transactions on Pattern Analysis and Machine Intelligence (Under review) **TPAMI**, 1-14.

**International Conferences: CVPR 8, ICCV 6, ECCV 2, ICML 1, EMNLP 1, ICIP 1**

1. Aliakbarian, M. S., Saleh, F., Salzmann, M., Fernando, B., Petersson, L., & Andersson, L. (2017). Encouraging LSTMs to Anticipate Actions Very Early. in 'IEEE International Conference on Computer Vision **ICCV** 2017 (accepted)'.
2. Fernando, B., Bilen, H., Gavves, E., & Gould, S. (2016). Self-Supervised Video Representation Learning With Odd-One-Out Networks. in 'IEEE International Conference on Computer Vision and Pattern Recognition **CVPR** 2017'.
3. Cruz, R. S., Fernando, B., Cherian, A., & Gould, S. (2017). DeepPermNet: Visual Permutation Learning. in 'IEEE International Conference on Computer Vision and Pattern Recognition **CVPR** 2017'.
4. Cherian, A., Fernando, B., Harandi, M., & Gould, S. (2017). Generalized rank pooling for activity recognition. in 'IEEE International Conference on Computer Vision and Pattern Recognition **CVPR** 2017'.
5. Anderson, P., Fernando, B., Johnson, M., & Gould, S. (2017). Zero-Shot Image Captioning with Constrained Beam Search, To appear in Conference on Empirical Methods in Natural Language Processing, 2017 **EMNLP** 2017'.
6. Anderson, P., Fernando, B., Johnson, M., & Gould, S. (2016). SPICE: Semantic Propositional Image Caption Evaluation, in 'European Conference on Computer Vision **ECCV** 2016'.
7. Fernando, B. & Gould, S. (2016) Learning End-to-end Video Classification with Rank-Pooling, in 'International Conference on Machine Learning **ICML** 2016'.
8. Bilen, H.; Fernando, B.; Gavves, E.; Vedaldi, A. & Gould, S. (2016), Dynamic Image Networks for Action Recognition, in 'IEEE International Conference on Computer Vision and Pattern Recognition **CVPR** 2016'.
9. Fernando, B.; Anderson, P.; Hutter, M. & Gould, S. (2016), Discriminative Hierarchical Rank Pooling for Activity Recognition, in 'IEEE International Conference on Computer Vision and Pattern Recognition **CVPR** 2016'.

10. Fernando, B.; Gavves, E.; Oramas, J.; Ghodrati, A. & Tuytelaars, T. (2015), Modeling video evolution for action recognition, in 'IEEE International Conference on Computer Vision and Pattern Recognition **CVPR** 2015'.
11. Fernando, B.; Gavves, E.; Muselet, D. & Tuytelaars, T. (2015), Learning to rank based on subsequences, in 'IEEE International Conference on Computer Vision **ICCV** 2015'.
12. Jia, X.; Gavves, S.; Fernando, B. & Tuytelaars, T. (2015), Guided long-short term memory for image caption generation, in 'IEEE International Conference on Computer Vision **ICCV** 2015'.
13. Rematas, K.; Fernando, B.; Dellaert, F. & Tuytelaars, T. (2015), Dataset Fingerprints: Exploring Image Collections Through Data Mining, in 'Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition **CVPR** 2015', pp. 4867–4875.
14. Fernando, B.; Muselet, D.; Khan, R. & Tuytelaars, T. (2014), Color features for dating historical color images, in 'IEEE International Conference on Image Processing **ICIP** 2014'.
15. Aly, R.; Arandjelovic, R.; Chatfield, K.; Douze, M.; Fernando, B.; Harchaoui, Z.; McGuinness, K.; OConner, N. E.; Oneata, D.; Parkhi, O. M. & others (2013), The AXES submissions at TrecVid 2013, in 'TrecVid'.
16. Aly, R.; Arandjelovic, R.; Chatfield, K.; Douze, M.; Fernando, B.; Harchaoui, Z.; McGuinness, K.; O'Connore, N.; Oneata, D.; Parkhi, O. M. & others (2013), AXES at TRECVid 2013, in 'TRECVid', NIST, .
17. Fernando, B.; Habrard, A.; Sebban, M. & Tuytelaars, T. (2013), Unsupervised Visual Domain Adaptation Using Subspace Alignment, in 'IEEE International Conference on Computer Vision **ICCV** 2013'.
18. Fernando, B. & Tuytelaars, T. (2013), Mining Multiple Queries for Image Retrieval: On-the-fly learning of an Object-specific Mid-level Representation, in 'IEEE International Conference on Computer Vision **ICCV** 2013'.
19. Gavves, E.; Fernando, B.; Snoek, C.; Smeulders, A. & Tuytelaars, T. (2013), Fine-Grained Categorization by Alignments, in 'IEEE International Conference on Computer Vision **ICCV** 2013'.
20. Rematas, K.; Fernando, B.; Tommasi, T. & Tuytelaars, T. (2013), Does Evolution cause a Domain Shift?, in 'IEEE International Conference on Computer Vision **ICCV 2013 Workshop VisDA**'.
21. Aly, R.; McGuinness, K.; Chen, S.; O'Connor, N. E.; Chatfield, K.; Parkhi, O.; Arandjelovic, R.; Zisserman, A.; Fernando, B.; Tuytelaars, T. & others (2012), AXES at TRECVID 2012: KIS, INS, and MED, in '**TRECVID**'.
22. Aly, R.; McGuinness, K.; Chen, S.; OConner, N.; Chatfield, K.; Parkhi, O.; Arandjelovic, R.; Zisserman, A.; Fernando, B.; Tuytelaars, T. & others (2012), AXES at TRECVid 2012, in '**TRECVid**'.
23. Fernando, B.; Fromont, E.; Muselet, D. & Sebban, M. (2012), Discriminative Feature Fusion for Image Classification, in 'IEEE International Conference on Computer Vision and Pattern Recognition **CVPR** 2012'.
24. Fernando, B.; Fromont, E. & Tuytelaars, T. (2012), Effective Use of Frequent Itemset Mining for Image Classification, in 'European Conference of Computer Vision 2012 ( **ECCV** 12)'.

**Professional Activities**

- Organizing CVPR 2017 workshop titled *Brave New Ideas for Motion and Spatio-Temporal Representations.*
- Organising ECCV 2016 workshop titled *Brave New Ideas For Motion Representations.*
- Program committee member of *Robotic Vision RVSS 2016 Summer School.*
- Co-chairing the CVPR 2016 oral and spotlight session on *Learning and CNN Architectures.*
- Associate Editor for ICRA 2018.

- Reviewer for:

  CVPR 2013, 2015, 2016, 2017 reviewer
  ICCV 2013, 2017 reviewer
  ECCV 2014, 2016 reviewer
  NIPS 2016, 2017 reviewer
  TPAMI: IEEE Transactions on Pattern Analysis and Machine Intelligence
  IJCV: International Journal of Computer Vision
  CVIU: Computer vision and image understanding journal
  PR: Pattern Recognition Journal
  PRL: Pattern Recognition Letters Journal
  Machine Learning Journal
  IEEE Transactions on Neural Networks and Learning Systems
  IEEE Transactions on Multimedia

**Research Interests**

- Visual representation learning and deep learning.
- Visual recognition and analysis.
- Pattern recognition and data mining.
- Statistical machine learning.
- Computer vision.

**Research Experience**

- Human action recognition (CVPR15, CVPR16, CVPR17, ICCV17 ,TPAMI, IJCV17)
- Action detection (CVPR17)
- Unsupervised feature learning (CVPR17)
- Deep learning (ICML16, CVPR16, CVPR17, ICCV17)
- Domain adaptation (ICCV13, CVIU16, PRL16)
- Transfer learning (ICCV13, CVIU16, PRL16)
- Supervised ranking (ICCV15)
- Bi-level optimization (ICML16, CVPR16)
- Feature fusion (CVPR12)
- Dictionary learning (Pattern Recognition)
- Mid-level feature learning (ECCV12, ICCV13, IJCV)
- Fine-grained object class categorisation (ICCV13, IJCV)
- Image retrieval (ICCV13)

**Research Projects**

- Member of Australian Research Councils Centre of Excellence Robotic Vision - `http://roboticvision.org/`
- Member of EU-FP7 project AXES (2012-2015) - `http://www.axes-project.eu/`
- Member of BeeldCanon project (2011-2012) - `http://staff.science.uva.nl/~gavves/beeldcanon/html/`
- Contributor of ERC project Cognimund - `http://homes.esat.kuleuven.be/~tuytelaa/cognimund.html`
- Contributor of Pascal 2 Network of Excellence

**Best research outputs**

Citation profile source:
Google scholar `https://scholar.google.com.au/citations?user=GyvseMkAAAAJ&hl=en`
24 Oct. 2017: ***h-index: 18, i-10 index: 25, Citations: 1326***

**Programming & Software Engineering Skills**

Matlab, Octave, Python
MatConvNet, Tensorflow
OO Design and Software Architectures design.
Java, Java EE

**Honours and Awards**

Post doctoral research fellowship The Australian National University 2015-2018.
PhD research fellowship KU Leuven, Belgium 2011-2015.
Ranked First in European Master CIMET cohort 2009-2011.
Erasmus Mundus Scholarship (42000 Euro) 2009-2011.
Dean's list several times during 2003-2007 University of Moratuwa Sri Lanka.
Mahapola Scholarship 2003-2007.

**Student Supervision**

1. 2016-2019 - PhD thesis chair and co-advisor - Mohammad Sadegh Aliakbarian (ANU) - Human action anticipation - ICCV 2017 paper accepted.
2. 2015-2018 - PhD thesis co-advisor - Rodrigo Santa Cruz (ANU) - Self-supervised deep learning - paper accepted at CVPR 17.
3. 2015-2018 - PhD thesis co-advisor - Peter Anderson (ANU) - Vision and Language - paper accepted at ECCV 16, and EMNLP 17.
4. 2017-2020 - PhD thesis co-advisor - Zachary Jiang (ANU) - Kernelized deep learning .
5. 2016-2019 - PhD thesis co-advisor - Samitha Herath (ANU) - Deep transfer learning methods.
6. 2016-2019 - PhD thesis co-advisor - Cristian Rodriguez Opazo (ANU) - Deep content generation.
7. 2016 - Supervise project for COMP2560 - Studies in Advanced Computing R&D - Mathew Brown - Paper submitted to CVPR 2017.
8. 2017 - Supervise 12 unit project for ENGN4712 - Engineering Research and Development Project - Tengda Han - Video object segmentation.
9. 2017 - Supervise 12 unit project for ENGN4200 - Individual Project - Yuge (Jimmy Shi) - Video action prediction.
10. 2013 : Learning object categories from the web - Alberto Dominguez (Master thesis KU Leuven).

**Teaching Activities**

2017 Semester 1 : ENGN4528: Computer Vision at ANU
2016 Semester 2 : ENGN8536: Advanced Topics in Mechatronics Systems
2016 Semester 1 : ENGN4528: Computer Vision at ANU
Tutorial on Action recognition and semantic vision at Robotic Vision Summer School RVSS 2017
2015 Spring : H09J2A: Pattern Recognition and Image Interpretation (TA) at KU Leuven
2014 Spring : H09J2A: Pattern Recognition and Image Interpretation (TA) at KU Leuven
2013 Spring : H09J2A: Pattern Recognition and Image Interpretation (TA) at KU Leuven

**Seminar/Talks**

- May 24, 2016 - Rank pooling and variants for action and activity recognition - ACRV The Australian National University
- March 17, 2016 - Action and Activity Recognition Research at ANU - Australian Centre for Visual Technologies, The University of Adelaide, Australia
- July 15, 2015 - Effective Image and Video Representations - Australian Centre for Robotic Vision, The Australian National University, Australia
- March 30, 2015 - Image Representations for Improving Object Recognition - VISICS Lab, Leuven, Belgium
- Dec 12, 2013 - Unsupervised Visual Domain Adaptation Using Subspace Alignment - VISICS Lab, Leuven, Belgium
- May 15, 2012 - Discriminative Feature Fusion for Image Classification - VISICS Lab, Leuven, Belgium
- Nov 22, 2012 - Learning mid-level features for image retrieval - Hubert-Curien Lab, Saint Etienne, France
- Dec 04, 2012 - Learning mid-level features for classification and retrieval - Intelligent Systems Lab, Amsterdam
- Dec 12, 2013 - Mining Multiple Queries for Image Retrieval: On-the-fly learning of an Object-specific Mid-level Representation - VISICS Lab, Leuven, Belgium