ANOOP CHERIAN, PHD

Principal Research Scientist

Mitsubishi Electric Research Labs (MERL)
201 Broadway, 8th Floor
Cambridge, MA, USA 02139

Adjunct Senior Lecturer,
Australian National University,
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EDUCATION

PhD in Computer Science **2013**
University of Minnesota, Minneapolis, USA

M.S. in Computer Science **2010**
University of Minnesota, Minneapolis, USA

B. Tech. (Honors) in Computer Science and Engineering **2002**
National Institute of Technology, Kerala, India

RESEARCH INTERESTS

Computer Vision, Machine Learning, and Robotics

Multimodal Reasoning, Embodied AI, Scene Representation Learning, Nonconvex Optimization, Graph Neural Networks, Unsupervised Learning, Video Modelling, Human Pose Estimation

AWARDS AND HONOURS

Outstanding Reviewer, International Conf. on Machine Learning (ICML), 2022

MELCO ATC H-Award, Object Instance Segmentation for Robotic Bin Picking, MERL, 2022

Outstanding Reviewer, Advances in Neural Information Processing Systems (NeurIPS), 2020

President's Award, Scene-Aware Interaction Technologies, MERL, 2019

Outstanding Reviewer Award, Computer Vision and Pattern Recognition (CVPR), 2017

Outstanding Reviewer Award, European Conference of Computer Vision (ECCV), 2016

Best Student Paper Award, International Conference on Image Processing (ICIP), Orlando, 2012

Best Poster Award, Minnesota Supercomputing Institute, Minneapolis, 2012

Research Metrics (Google Scholar): H-index = 29, i10-index=55, #citations=2682+

Employment Status: US Green Card Holder

ACADEMIC AND INDUSTRIAL POSITIONS

Principal Research Scientist — 2020 –
Mitsubishi Electric Research Labs (MERL)
Cambridge, MA

Research Scientist — 2017 – 2020
Mitsubishi Electric Research Labs (MERL)
Cambridge, MA

Research Fellow — 2015 – 2017
Australian Centre for Robotic Vision
Australian National University, Australia
With Prof. Richard Hartley and Prof. Stephen Gould

Postdoctoral Researcher — 2012 – 2015
LEAR Project Group
INRIA, Rhone-Alpes, France
With Dr. Cordelia Schmid and Dr. Julien Mairal

Research Intern — 2010 – 2010
Benhard Scholkopf Group
Max Planck Institute for Biological Cybernetics, Germany
With Dr. Suvrit Sra and Dr. Jan Peters

Research Assistant — 2008 – 2012
Distributed Robotics Lab
University of Minnesota, USA
With Prof. Nikolaos Papanikolopoulos

Software Design Engineer — 2005 – 2007
Microsoft Corporation, Hyderabad, India

SCIENTIFIC PUBLICATIONS AND PATENTS

* PhD students supervised by me when writing the respective papers.

** under-graduate students supervised by me

Invited Book Chapters

1) **A. Cherian** and S. Sra, "Positive Definite Matrices: Data Representation and Application to Computer Vision"*, Algorithmic Advances in Riemannian Geometry and Applications - For Machine Learning, Computer Vision, Statistics, and Optimization*, Springer, 2016

Journal Articles

2) **A. Cherian** and J. Wang*, "Generalized One-class Learning Using Pairs of Complementary Classifiers*", IEEE Transactions on Pattern Analysis and Machine Intelligence* (TPAMI), 2021

3) **A. Cherian**, P. Stanitsas*, J. Wang, M. Harandi, V. Morellas, and N. Papanikolopoulos, "Learning Log-Det Divergences for Positive Definite Matrices", *IEEE Transactions on Pattern Analysis and Machine Intelligence* (TPAMI), 2021

4) S. Kim, M. Galley, C. Gunasekara, S. Lee, A. Atkinson, B. Peng, H. Schulz, J. Gao, J. Li, M. Adada, M. Huang, L. Lastras, J. K Kummerfeld, W. Lasecki, C. Hori, **A. Cherian**, T. Marks, A. Rastogi, X. Zang, S. Sunkara, R. Gupta, "Overview of the eighth dialog system technology challenge: DSTC8", *IEEE/ACM Transactions on Audio, Speech, and Language Processing* (TASLP), 2021

5) P. Koniusz, L. Wang, and **A. Cherian**, "Tensor Representations for Action Recognition", *IEEE Transactions on Pattern Analysis and Machine Intelligence* (TPAMI), 2021

6) P. Stantisas*, **A. Cherian**, A. Turkinovsky, V. Morellas, and N. Papanikolopoulos, "Image Descriptors for Weakly Supervised Histapathological Breast Cancer Data", *Frontiers in Digital Health, 2020*

7) J. Wang* and **A. Cherian**, "Discriminative Video Representation Learning Using Support Vector Classifiers*", IEEE Transactions on Pattern Analysis and Machine Intelligence* (TPAMI), 2020

8) **A. Cherian** and S. Gould, "Second-order Temporal Pooling for Action Recognition", *International Journal of Computer Vision* (IJCV), 2018

9) R. Santacruz*, B. Fernando, **A. Cherian**, and S. Gould, "Visual Permutation Learning", *IEEE Transactions on Pattern Analysis and Machine Intelligence* (TPAMI), 2018

10) N. Zhong, W. Yang, **A. Cherian**, and X. Yang, "Unsupervised Classification of Polarimetric SAR Images via Riemannian Sparse Coding", *IEEE Transactions on Geoscience and Remote Sensing*, 2017

11) **A. Cherian** and S. Sra, "Riemannian Dictionary Learning and Sparse Coding for Positive Definite Matrices", *IEEE Transactions on Neural Networks and Learning Systems* (TNNLS), 2016 (IF: 4.84)

12) **A. Cherian**, V. Morellas, and N. Papanikolopoulos, "Bayesian Nonparametric Clustering of Positive Definite Tensors*", IEEE Transactions on Pattern Analysis and Machine Intelligence* (TPAMI), 2015

13) J. Andersh, **A. Cherian**, B. Mettler, and N. Papanikolopoulos, "A Vision based Ensemble Approach to Velocity Estimation for Miniature Rotorcraft"*, Autonomous Robots*, 39(2), 123—138, 2015

14) **A. Cherian**, V. Morellas, and N. Papanikolopoulos, "Efficient Similarity Search via Robust Sparse Hashing"*, IEEE Transactions on Image Processing*, 23(8), 3646—3655, 2014

15) **A. Cherian**, S. Sra, A. Banerjee, and N. Papanikolopoulos, "Jensen-Bregman Logdet Divergence for Efficient Distance Computations on Positive Definite Matrices", *IEEE Transactions on Pattern Analysis and Machine Intelligence* (TPAMI), 35(9), 2161—2174, 2013

16) G. Somasundaram, **A. Cherian**, V. Morellas, and N. Papanikolopoulos, **"**Action Recognition Using Global Spatio-Temporal Features Derived from Sparse Representations*", Computer Vision and Image Understanding*, 123:1-13, 2013

Conference Articles

17) S. Paul*, A. Chowdhary, and **A. Cherian**, "AVLEN: Audio-Visual-Language Embodied Navigation in 3D Environments*", Advances in Neural Information Processing Systems (NeurIPS), 2022 (accepted)*

18) M. Chatterjee*, N. Ahuja, and **A. Cherian**, "Learning Audio-Visual Dynamics Using 2.5D Scene Graphs for Audio Source Separation", *Advances in Neural Information Processing Systems (NeurIPS), 2022 (accepted)*

19) A. Roy, A. Shah, K. Shah, P. Dhar, **A. Cherian**, and R. Chellappa, "FeLMi: Few shot Learning with hard Mixup", *Advances in Neural Information Processing Systems (NeurIPS), 2022 (accepted)*

20) **A. Cherian**, S. Jain, T. K. Marks, and A. Sullivan, "Discriminative 3D Shape Modeling for Few-shot Instance Segmentation*", International Conference on Robotics and Automation (ICRA)*, (under review)

21) K. Ota, H. Tung, K. Smith, **A. Cherian**, T. K. Marks, A. Sullivan, A. Kanezaki, and J. B. Tenenbaum, "H-SAUR: Hypothesize, Simulate, Act, Update, and Repeat for Understanding Object Articulations from Interactions", *International Conference on Robotics and Automation (ICRA)*, (under review)

22) **A. Cherian**, C. Hori, T. Marks, and J. Le Roux, "(2.5+1)D Spatio-Temporal Scene Graphs for Video Question Answering", *AAAI Conference on Artificial Intelligence* (AAAI), 2022 (Oral presentation, 3% acceptance)

23) A. Shah*, S. Sra, R. Chellappa, and **A. Cherian**, "Max-Margin Contrastive Learning", *AAAI Conference on Artificial Intelligence* (AAAI), 2022 (15% acceptance)

24) S. Medin, B. Egger, **A. Cherian**, Y. Wang, J. Tenenbaum, X. Liu, and T. Marks, "MOST-GAN: 3D Morphable StyleGAN for Disentangled Face Image Manipulation", *AAAI Conference on Artificial Intelligence* (AAAI), 2022 (15% acceptance)

25) A. Shah, S. Geng, P. Gao, **A. Cherian**, T. Hori, T. Marks, J. Roux, C. Hori, "Audio-Visual Scene-Aware Dialog and Reasoning using Audio-Visual Transformers with Joint Student-Teacher Learning", International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2022

26) M. Chatterjee*, N. Ahuja, and **A. Cherian**, "A Hierarchical Variational Neural Uncertainty Model for Stochastic Video Prediction", *International Conference on Computer Vision* (ICCV), 2021 (Oral presentation, 3% acceptance)

27) **A. Cherian**, G. Pais*, S. Jain, T. Marks, and A. Sullivan, "InSeGAN: A Generative Approach to Segmenting Identical Instances in Depth Images", *International Conference on Computer Vision* (ICCV), 2021 (26% acceptance)

28) M. Chatterjee*, J. Le Roux, N. Ahuja, and **A. Cherian**, "Visual Scene Graphs for Audio Source Separation", *International Conference on Computer Vision* (ICCV), 2021 (26% acceptance)

29) S. Geng*, P. Gao, M. Chatterjee*, C. Hori, J. Le Roux, Y. Zhang , H. Li, and **A. Cherian**, "Dynamic Graph Representation Learning for Video Dialog via Multi-Modal Shuffled Transformers", *AAAI Conference on Artificial Intelligence* (AAAI), 2021 (25% acceptance)

30) M. Benosman, O. Romero, and **A. Cherian**, "Optimizing Deep Neural Networks via Discretization of Finite-Time Convergent Flows", arXiv, https://arxiv.org/abs/2010.02990, 2021

31) S. Kumar, L. Van Gool, C. de Oliveira, **A. Cherian**, Y. Dai, and H. Li, "Dense Non-Rigid structure from motion: A manifold viewpoint", arXiv preprint arXiv:2006.09197

32) M. Chatterjee* and **A. Cherian**, "Sound2Sight: Generating Visual Dynamics from Sound and Context", *European Conference on Computer Vision* (ECCV), 2020

33) **A. Cherian**, J. Wang*, C. Hori, and T.K. Marks, "Spatio-Temporal Ranked-Attention Networks for Video Captioning", *IEEE Winter Conference on Computer Vision* (WACV), 2020

34) R. Huang, W. Xu, T.Y. Lee, **A Cherian**, Y. Wang, and T. Marks, "FX-GAN: Self-supervised gan learning via feature exchange", *IEEE Winter Conference on Computer Vision* (WACV), 2020

35) A. Kumar, T. K. Marks, W. Mou, Y. Wang, M. Jones, **A. Cherian**, T. Koike-Akino, X. Liu, and C. Feng, "LUVLi Face Alignment: Estimating Landmarks' Location, Uncertainty, and Visibility Likelihood", *Computer Vision and Pattern Recognition* (CVPR), 2020

36) A. Raghunathan, **A. Cherian**, and D. Jha, "Game Theoretic Optimization via the Gradient-based Nikaido-Isoda Function", *International Conference on Machine Learning* (ICML), 2019

37) H. Alamri, V. Cartillier, A. Das, J. Wang, S. Lee, P. Anderson, I. Essa, D. Parikh, D. Batra, **A. Cherian**, T. Marks, and C. Hori, "Audio-Visual Scene-Aware Dialog", *Computer Vision and Pattern Recognition*, 2019

38) C Hori, **A Cherian**, TK Marks, and T Hori, "Joint Student-Teacher Learning for Audio-Visual Scene-Aware Dialog.", *INTERSPEECH*, 2019

39) J. Wang* and **A. Cherian**, GODS: "Generalized One-class Discriminative Subspaces for Anomaly Detection", *International Conference on Computer Vision* (ICCV), 2019

40) C. Hori, H. Alamri, J. Wang, G. Wichern, T. Hori, **A. Cherian**, T. K Marks, V. Cartillier, R.Gontijo Lopes, A. Das, I. Essa, D. Batra, and D. Parikh, "End-to-end audio visual

scene-aware dialog using multimodal attention-based video features", *IEEE International Conference on Acoustics, Speech and Signal Processing* (ICASSP), 2019

41) **A. Cherian** and A. Sullivan, "Sem-GAN: Semantically-consistent Image-to-Image Translation", IEEE *Winter Conference on Applications of Computer Vision* (WACV), 2019

42) J. Wang* and **A. Cherian**, "Discriminative Video Representation Learning Using Adversarial Perturbations", *European Conference on Computer Vision* (ECCV), 2018 (Oral presentation, acceptance rate <2.5%)

43) **A. Cherian**, S. Sra, S. Gould, and R. Hartley, "Non-Linear Temporal Subspace Representations for Activity Recognition*", Computer Vision and Pattern Recognition* (CVPR), 2018

44) S. Kumar*, **A. Cherian**, Y. Dai, and H. Li, "Scalable Non-rigid Structure from Motion: A Grassmannian Perspective", *Computer Vision and Pattern Recognition* (CVPR), 2018

45) J. Wang*, **A. Cherian**, F. Porikli, and S. Gould, "Video Representation Learning Using Discriminative Pooling", *Computer Vision and Pattern Recognition* (CVPR), 2018

46) R. Santa Cruz*, B. Fernando, **A. Cherian**, and S. Gould, "Neural Algebra of Classifiers", *Winter Conference on Applications of Computer Vision* (WACV), 2018

47) S. Toyer**, **A. Cherian**, T. Han**, and S. Gould, "Human Pose Forecasting via Deep Markov Models", *Intl. Conf. on Digital Image Computing: Techniques and Applications* (DICTA)*, 2017*

48) **A. Cherian**, B. Fernando, M. Harandi, and S. Gould, "Generalized Rank Pooling for Action Recognition", *Computer Vision and Pattern Recognition* (CVPR), 2017

49) R. SantaCruz*, B. Fernando, **A. Cherian**, and S. Gould, "DeepPermNet: Visual Permutation Learning", *Computer Vision and Pattern Recognition* (CVPR), 2017

50) **A. Cherian**, P. Stanitsas*, M. Harandi, V. Morellas, and N. Papanikolopoulos, "Learning Discriminative Alpha-Beta Divergences for Positive Definite Matrices", *International Conference on Computer Vision* (ICCV), 2017

51) **A. Cherian**, P. Koniusz, and S. Gould, "Higher-order Pooling on CNN Features via Kernel Linearization for Action Recognition*", Winter Conference on Applications of Computer Vision* (WACV), 2017

52) J. Wang*, **A. Cherian**, and F. Porikli, "Ordered Pooling of Optical Flow Sequences for Action Recognition", *Winter Conference on Applications of Computer Vision* (WACV), 2017

53) P. Stanitsas*, **A. Cherian**, A. Truskinovsky, V. Morellas, and N. Papanikolopoulos, "Active Convolutional Neural Networks for Cancerous Tissue Recognition", *IEEE Conference on Image Processing* (ICIP), 2017 (oral presentation)

54) C. Peng*, H. Li, **A. Cherian**, and H. Yao, "Part-based Fine-grained Bird Image Retrieval Respecting Species Correlation", *IEEE International Conference on Image Processing*, (ICIP), 2017

55) S. Gould, B. Fernando, **A. Cherian**, P. Anderson, R. Santa Cruz, and E. Guo, "On Differentiating Parameterized Argmin and Argmax with Application to Bi-level Optimization", *CoRR arxiv:1607.05447*, 2016

56) P. Koniusz, **A. Cherian**, and F. Porikli, "Tensor Representations Using Kernel Linearization for Action Recognition from 3D Skeletons", *European Conference on Computer Vision* (ECCV), 2016, Springer

57) P. Koniusz and **A. Cherian**, "Sparse Coding for Third-order Supersymmetric Tensors with Application to Texture Recognition", *Proceedings of the IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*, 2016, IEEE (Spotlight paper, Top 10% of accepted papers)

58) Y. Wen, N. Zhong, X. Yang, and **A. Cherian**, "Riemannian Sparse Coding for Classification of PolSAR Images", *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, 2016, IEEE (Oral Presentation)

59)P.Stanitsas*, **A. Cherian**, V. Morellas, and N. Papanikolopoulos, "Active Constrained Clustering via Non-Iterative Uncertainty Sampling", *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS),* 2016, IEEE

60) P. Stanitsas*, **A. Cherian**, X. Li, A. Truskinovsky, V. Morellas, and N. Papanikolopoulos, "Evaluation of Feature Descriptors for Cancerous Tissue Recognition", IEEE *International Conference on Pattern Recognition* (ICPR), 2016, IEEE (Oral Presentation)

61) **A. Cherian**, J. Mairal, K. Alahari, and C. Schmid, "Mixing Body-part Sequences for Human Pose Estimation", *Proceedings of the IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*, 2014

62)**A. Cherian**, "Nearest Neighbors Using Compact Sparse Codes", *Proceedings of the 31st International Conference on Machine Learning (ICML)*, 1053—1061, 2014

63)**A. Cherian** and S. Sra, "Riemannian Sparse coding of Positive Definite Matrices", *Proceedings of the European Conference on Computer Vision (ECCV)*, 299—314, 2014, Springer International Publishing

64)**A. Cherian**, V. Morellas, and N. Papanikolopoulos, "Robust Sparse Hashing", Proceedings of the International Conference on Image Processing (ICIP), 2417—2421, 2012, IEEE (Best student paper award)

65)R. Sivalingam, **A. Cherian**, V. Morellas, N. Papanikolopoulos, G. Sapiro, et al., "A Multi-Sensor Visual Tracking System for Behavior Monitoring of At-Risk Children", *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 1345—1350, 2012, IEEE

66)D. Fehr, **A. Cherian**, R. Sivalingam, S. Nikolay, V. Morellas, and N. Papanikolopoulos, "Compact Covariance Descriptors in 3D Point Clouds for

Object Recognition", *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 1793—1798, 2012, IEEE

67) **A. Cherian**, S. Sra, A. Banerjee, and N. Papanikolopoulos, "Efficient Similarity Search for Covariance Matrices via the Jensen-Bregman Logdet Divergence", *Proceedings of the IEEE International Conference on Computer Vision (ICCV)*, 2399—2406, 2011, IEEE (Spotlight Presentation)

68) **A. Cherian**, V. Morellas, N. Papanikolopoulos, and S. Bedros, "Dirichlet Process Mixture Models on Symmetric Positive Definite Matrices for Appearance Clustering in Video Surveillance Applications", *Proceedings of the IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*, 3417—3424, 2011, IEEE

69) S. Sra and **A. Cherian**, "Generalized Dictionary Learning for Symmetric Positive Definite Matrices with Application to Nearest Neighbor Retrieval", *Machine Learning and Knowledge Discovery in Database* (ECML), 318—332, 2011, Springer Berlin Heidelberg

70) **A. Cherian**, S. Sra, and N. Papanikolopoulos, "Denoising Sparse Noise via Online Dictionary Learning", *Proceedings of the IEEE International Conference on Accoustics, Speech and Signal Processing (ICASSP)*, 2060—2063, 2011, IEEE

71) **A. Cherian**, V. Morellas, and N. Papanikolopoulos, "Approximate Nearest Neighbors via Dictionary Learning", *SPIE Defense, Security, and Sensing*, 80581M-80581M, 2011, International Society for Optics and Photonics (Oral Presentation)

72) **A. Cherian**, V. Morellas and N. Papanikolopoulos, "Efficient Similarity Search via Sparse Coding", *Technical Report*, *Department of Computer Science and Engineering*, University of Minnesota, 2011

73) **A. Cherian**, J. Andersh, V. Morellas, B. Mettler and N. Papanikolopoulos, "Motion Estimation of a Miniature Helicopter using a Single Onboard Camera", *American Control Conference (ACC)*, 4456—4461, 2010, IEEE

74) **A. Cherian**, J. Andersh, V. Morellas, N. Papanikolopoulos, and B. Mettler, "Autonomous Altitude Estimation of a UAV using a Single Onboard Camera", *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS),* 3900—3905, 2009, IEEE

75) **A. Cherian**, V. Morellas, and N. Papanikolopoulos, "Accurate 3D Ground Plane Estimation from a Single Image", *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA),* 2243—2249, 2009, IEEE

Workshop Articles

76) M. Chatterjee*, N. Ahuja, **A. Cherian**, "Quantifying Predictive Uncertainty for Stochastic Video Synthesis from Audio", *Sound and Sight CVPR Workshop*, 2022

77) RS Cruz*, **A Cherian**, B Fernando, D Campbell, and S Gould, "Inferring Temporal Compositions of Actions Using Probabilistic Automata", *CVPR Workshops*, 2020

78) Y Wu, T Marks, **A Cherian**, S Chen, C Feng, G Wang, and A Sullivan, "Unsupervised Joint 3D Object Model Learning and 6D Pose Estimation for Depth-Based Instance Segmentation", *ICCV Workshops*, 2019

79) H. Alamri, V. Cartillier, R. Gontijo Lopes, A. Das, J. Wang, I. Essa, D. Batra, D. Parikh, **A. Cherian**, T. K Marks, C. Hori, "Audio Visual Scene-Aware Dialog (AVSD) Challenge at DSTC7", *CVPR Workshops*, 2018

80) P. Stanitsas*, **A. Cherian**, V. Morellas, and N. Papanikolopoulos, "Clustering Positive Definite Matrices via Learning Information Divergences", *IEEE Workshop on Manifold Learning: From Euclid to Riemann, ICCV Workshops, Venice*, 2017

81) J. Wang* and **A. Cherian**, "Discriminative Subspace Pooling for Action Recognition", Workshop on Perceptual Organization in Computer Vision (POCV), *European Conference on Computer Vision (ECCV),* 2018

82) **A. Cherian** and N. Papanikolopoulos, **"**Large Scale Image Search via Sparse Coding**"**, *Minnesota Supercomputing Institute (MSI) Poster Competition*, 2012 (Best Poster Award)

Patents Filed

83) **A. Cherian** and A. Shuchin, "Artificial Intelligence System for Classification of Data Based on Contrastive Learning", US Patent, 2021

84) S. Geng, P. Gao, **A. Cherian**, C. Hori, and J. Le Roux, "Scene-Aware Video Dialog", US Patent, 2021

85) C. Hori, **A. Cherian**, T. Marks, and T. Hori, "System and Method for a Dialogue Response Generation System", US Patent, 2021

86) C. Hori, **A. Cherian**, S. Chen, T. Marks, J. Le Roux, T. Hori, B. Hersham, A. Vetro, and A. Sullivan, "Method and System for Scene-Aware Interaction", US Patent, 2021

87) C. Hori, M. Tsuchiya, S. Chen, **A. Cherian**, T. Hori, B. Hersham, T. Marks, J. Le Roux, A. Sullivan, and A. Vetro, "Scene-Aware Interaction", US Patent, 2021

88) **A. Cherian**, C. Hori, T. Marks, and J. Le Roux, "Scene-Aware Video Encoder System and Method", 2022 (filed)

89) M. Chatterjee, **A. Cherian**, and J. Le Roux, "Scene Aware Audio-Video Representation", 2022 (filed)

90) **A. Cherian**, G. Pais, S. Jain, T. Marks, and A. Sullivan, "A Generative Approach to Instance Segmentation in Depth Images", 2022 (filed)

91) **A. Cherian**, T. Marks, and A. Sullivan, "Discriminative 3D Shape Modeling for Few-Shot Instance Segmentation", 2022 (filed)

92) S. Medin, T. Marks, X. Liu, **A. Cherian**, B. Egger, and J. Tenenbaum, "System and Method for Manipulating Two-Dimensional (2D) Images of Three-Dimensional (3D) Objects", 2022

93) P. Stanitsas, **A. Cherian**, V. Morellas, N. Papanikolopoulos, and A. Truskinovsky, "*Computer Vision for Cancerous Tissue Recognition*", US Patent, 2018

SCIENTIFIC LEADERSHIP ACTIVITES

1. With S. Gould, D. Campbell, and R. Hartley, "Workshop on Deep Declarative Networks", CVPR, 2020
2. With Harm et al., "Visually Grounded Interaction and Language (ViGIL) Workshop" as part of **NeurIPS**, Montreal, Dec, 2018 https://nips2018vigil.github.io/
3. With P. Koniusz and F. Porikli, "Workshop on Tensor Methods in Computer Vision", *Computer Vision and Pattern Recognition* (**CVPR**), July 2017, http://users.cecs.anu.edu.au/~koniusz/tensors-cvpr17/
4. With R. Mahony, "Robotic Vision Summer School", 5-day International Summer School, Australia, March, 2017, http://roboticvision.org/events/rvss-summer-school/
5. With J. Leitner and S. Shirazi, "Deep Learning and its Applications in Vision and Robotics", *Joint workshop with Australian Conference on Robotic Vision* (**ACRA**) and *Conference on Artificial Intelligence* (**AI**), Dec. 2015, http://juxi.net/workshop/deeplearning-applications-vision-robotics-2015/

SCIENTIFIC TALKS AND POSTER PRESENTATIONS

1) "Neural Scene Representations for Multimodal Machine Intelligence", Keynote talk at Speech and Audio in the North East (SANE) Workshop, 2022
2) "(2.5+1)D Scene Graphs for Video Question Answering", AAAI Oral Talk, 2022
3) "InSeGAN: An Unsupervised Approach to Identical Instance Segmentation", Visual Information Lab, University of Bristol, UK, 2021
4) "Dynamic Graph Representation Learning for Audio-Visual Scene-Aware Dialog", Computational Cognitive Science Lab, MIT, 2021
5) "Sound2Sight: Audio-conditioned Visual Imagination", Multimodal Video Analysis, ECCV, 2020
6) "Discriminative Video Representation Learning Using Adversarial Perturbations", European Conference on Computer Vision (ECCV), oral talk, Munich, 2018
7) "Fine-grained Action Representations for Human-Robot Interactions", *RoboVis*, Melbourne, Sept, 2016
8) "Tensor Sparse Representations for Fine-grained Action Recognition", *Mitsubishi Electric Research Labs*, August, 2016
9) "Tensor Representations for Fine-grained Action Recognition", CSAIL, *Massachusetts Institute of Technology (MIT)*, July, 2016
10) "Tensor Representations for Fine-grained Action Recognition", *University of Minnesota*, Minneapolis, July, 2016

11) “Human Pose Estimation Using Recombination of Parts”, *RoboVis*, Adelaide, Australia, June 2015

12)“Pattern mining in visual data”, *Siemens Corporate Research*, Princeton, USA, July, 2014

13)“Mixing Body-Part Sequences for Human Pose Estimation”, Microsoft Research-INRIA joint center, Paris, May 2014

14)“Pattern Mining in Visual data – Applications to Human Pose Estimation and Visual Content Search”, *Yahoo Labs*, Bangalore, April 2014

15)“Human Pose Estimation via Structured Regularization”, *Microsoft Research-INRIA Joint Center*, Paris, Spring, 2013

16)“Large Scale Image Search via Sparse Coding”, *Minnesota Supercomputing Institute Research Exhibition*, April 2012 (**Best Poster Award** - out of 44 posters from multiple scientific disciplines)

17)“Robust Sparse Hashing”, *Intl. Conference on Image Processing (ICIP),* Florida, Orlando, 2012

18)“State Estimation of a Miniature Helicopter combining IMU, Gyros and Vision”, *Symposium on Safety Security and Rescue Research*, DTC, University of Minnesota, Nov. 2011

19)“Sparse Feature Descriptors for Fast Information Retrieval”, *Symposium on Safety Security and Rescue Research*, University of Pennsylvania, May 2011

20)**“**Approximate Nearest Neighbors via Dictionary Learning”, Invited Talk, *Computer vision Lectures*, University of Minnesota, 2011

21)“Approximate Nearest Neighbors via Dictionary Learning”, Oral Presentation, *SPIE Conference*, Florida, 2011

22)“Efficient Similarity Search for Covariance Matrices via the Jensen-Bregman Logdet Divergence”, *Spotlight Presentations, ICCV*, Barcelona, 2011

23) **“**Machine Learning in Computer Vision - A Tutorial”, *Safety Security Rescue Research Center (SSR-RC)*, Digital Technology Center, University of Minnesota, 2009

24)**“**Altitude Estimation of a UAV using a Single Onboard Camera”, *Intl. Conf. on Intelligent Robot Systems (IROS)*, St. Louis, 2009

STUDENT SUPERVISING / IN PHD STUDENT PANEL / INTERNS

1. Ram Ramrakya*, MERL Intern, M.S. student at Georgia Institute of Technology, Atlanta, 2022
2. Tao Liu*, MERL Intern, Ph.D student at Texas A&M University, 2022
3. Xiulong Liu*, MERL Intern, Ph.D student at the University of Washington, 2022
4. Nithin Gopalakrishnan, MERL Intern, Ph.D. student at John-Hopkins University, 2022 (co-supervised with Dr. Tim Marks)
5. Zach Carmichael, MERL Intern, Ph.D, Student, Indiana University, 2022 (co-advised with Dr. Michael Jones)
6. Susmija Reddy, MERL Intern, Ph.D. student at the University of Maryland, 2021 (co-supervised with Dr. Michael Jones)
7. Aniket Roy*, MERL Intern, PhD Student at the John Hopkins University, 2021
8. Safa Medin, MERL Intern, PhD Student, MIT, 2021-2022 (co-advised with Dr. Tim Marks)

9. Tejas Jayashankar, MERL Intern, PhD student, MIT, 2021-2022 (co-advised with Dr. Jonathan Le Roux)

10. Sudipta Paul*, MERL Intern, PhD Student from the University of California, Riverside, 2021-2022

11. Anshul Shah*, MERL Intern, PhD Student at the John Hopkins University, 2020

12. Moitreya Chatterjee*, MERL Intern, PhD Student at the University of Illinois-Urbana Champaign, 2020,2019 (currently Research Scientist at MERL)

13. Goncalo Pais*, MERL Intern, PhD Student at the University of Portugal, 2020

14. J. Wang*, MERL Intern, PhD Student from the Australian National University, 2018,2019 (currently at Facebook AI)

15. Jiawei Chen*, MERL Intern, PhD student at Boston University, 2018

16. Mikel Bober-Irizar*, MERL Intern, high-school student, Royal Grammar School, Guildford, UK, June-Nov 2018 (currently undergraduate student at the University of Cambridge, UK)

17. Yuanwei Wu, MERL intern, PhD student, co-superivsed with Dr. Tim Marks (MERL) and Dr. Chen Feng (NYU), 2018

18. Rui Huang, MERL intern, PhD Student, Carnegie Mellon University, co-supervised with Dr. Tim Marks (MERL), 2018

19. Sam Toyer*, Undergrad student, Australian National University, 2015-2017, Currently PhD Student at University of California, Berkeley

20. Tengda Han*, Undergrad student, Australian National University, 2016-2017, Currently PhD student at University of Oxford, UK

21. Panagiotis Stanitsas, PhD Student (with Prof. N. Papanikolopoulos), UMN, Thesis title: "*Computer Vision Approaches to Cancer Tissue Recognition*" (2013-17), currently with Insitro, CA.

22. Mr. Rodrigo SantaCruz, PhD Student, ANU (with Prof. Stephen Gould), Thesis title: "*Unsupervised Visual Representation Learning*" (2016)

23. Mr. Cheng Peng, Visiting PhD Student (with Prof. Hongdong Li)
Project: "*Part-based Approaches to Fine-grained Object Recognition*" (2016-17)

TEACHING

1. Jue Wang, PhD Student, Thesis: "Discriminative Representations for Action Recognition", Australian National University, 2016-2020

2. Supervising undergraduate student Mr. Sam Toyer, ANU, 2015-2017, Project: "*Human Pose Forecasting Using Deep Markov Models*" (Now PhD Student at University of Berkeley, California)

3. Supervising undergraduate student Mr. Tengda Han, ANU, 2016-Present, Project: "*Activity Progress Estimation Using Convolutional Neural Networks*" (Now PhD Student at University of Oxford, UK)

4. Co-supervising undergraduate student Mr. James Noble, ANU, 2017-Present,

Project: "*Water Detection in Roadways Using Fully Convolutional Networks*"

5. B.Sc. Thesis panel for undergraduate student Mr. Chang Li, ANU, 2016
6. B.Sc. Thesis panel for undergraduate student Mr. Kelji Li, ANU, 2016
7. B.Sc. Thesis panel for undergraduate student Mr. Abbe Wade, ANU, 2016
8. Teaching Assistant: Artificial Intelligence, University of Minnesota, 2010

INVITED PROGRAM COMMITTEE MEMBERSHIPS/JOURNAL REVIEWING

Editorials:

Guest Editor: Advances in Human Action Recognition Using Deep Learning, Journal of Imaging (co-edited with Dr. Basura Fernando)

International Conferences in Compute Vision, Machine Learning and Robotics:

Computer Vision and Pattern Recognition (CVPR), since 2011-
European Conference on Computer Vision (ECCV), since 2012-
International Conference on Computer Vision (ICCV), since 2011-
Asian Conference on Computer Vision (ACCV), since 2016-
Artificial Intelligence and Statistics (AISTATS), since 2015-
International Conference on Machine Learning (ICML), since 2015-
Advances in Neural Information Processing Systems (NIPS), since 2015-
AAAI Conference on Artificial Intelligence (AAAI), 2018,19, 20, 21
International Conference on Robotics and Automation (ICRA), 2009-

Journals in Computer Vision, Machine Learning, and Robotics:

IEEE Trans. Pattern Analysis and Machine Intelligence (PAMI), 2015-
Journal of Machine Learning Research (JMLR), 2014, 2016**,** 2017
International Journal of Computer Vision (IJCV), 2016-
IEEE Trans. Image Processing (TIP), 2014, 2015, 2016-
IEEE Trans. On Signal Processing (TSP, 2016, 2018
IEEE Trans. Neural Networks and Learning Systems (TNNLS), 2015, 16
IEEE Trans. Multimedia, 2015
Signal Processing Letters, (SPL) 2015, 2016
Journal of Intelligent Robotics, (JINT) 2009-2015
Optimization Methods and Software (OMS), 2015
Entropy, 2018
Journal of Inequalities and Applications (JIAP), 2018