Aravindh Mahendran

CONTACT INFORMATION

Research Scientist, Google Brain, Google Germany GmbH   aravindhm@google.com
Berlin, Germany   https://aravindhm.github.io/

OBJECTIVE

Develop and analyze machine learning methods for understanding visual information.

RESEARCH INTERESTS

Computer Vision, Machine learning, Deep learning

EDUCATIONAL RECORD

D. Phil in Engineering Science, Dept. of Engineering Science   Oct. 14 - Dec. 18
Thesis: Self-Supervised Learning Using Motion and Visualizing Convolutional Neural Networks
University of Oxford, Oxford, United Kingdom   *Advisor: Prof. Andrea Vedaldi*

Master of Science in Robotics, Robotics Institute   Aug. 12 - Dec. 13
Carnegie Mellon University, Pittsburgh, PA, USA   GPA: 4.11/4.33

Bachelor of Technology (Honors) Computer Science and Engineering   Aug. 08 - Jun. 12
International Institute of Information Technology Hyderabad, India   GPA: 9.81/10

PUBLICATIONS

Rob Romijnders, Aravindh Mahendran, Michael Tschannen, Josip Djolonga, Marvin Ritter, Neil Houlsby, Mario Lucic **"Representation learning from videos in-the-wild: An object-centric approach"**, WACV 2021.

Francesco Locatello, Dirk Weissenborn, Thomas Unterthiner, Aravindh Mahendran, Georg Heigold, Jakob Uszkoreit, Alexey Dosovitskiy, Thomas Kipf **"Object-centric learning with slot attention"**, NeurIPS 2020.

Michael Tschannen, Josip Djolonga, Marvin Ritter, Aravindh Mahendran, Neil Houlsby, Sylvain Gelly, Mario Lucic **"Self-Supervised Learning of Video-Induced Visual Invariances"**, CVPR 2020.

Aravindh Mahendran **"Self-supervised learning using motion and visualizing convolutional neural networks"** D.Phil Thesis, University of Oxford, 2018.

Aravindh Mahendran, James Thewlis, Andrea Vedaldi **"Cross Pixel Optical Flow Similarity for Self-Supervised Learning"**, ACCV 2018. [Oral with acceptance rate 4.6%]

Aravindh Mahendran, Andrea Vedaldi **"Visualizing Deep Convolutional Neural Networks Using Natural Pre-images"**, IJCV 2016, Issue 3, Volume 120, Pages 233-255.

Aravindh Mahendran, Andrea Vedaldi **"Understanding Deep Image Representations by Inverting Them"**, CVPR 2015. [Oral with acceptance rate 3.3%]

Aravindh Mahendran, Andrea Vedaldi **"Salient Deconvolutional Networks"**, ECCV 2016.

Aravindh Mahendran, Martial Hebert, Stephen Smith **"Exploiting domain constraints for exemplar based bus detection for traffic scheduling"** IEEE 17th International Conference on Intelligent Transportation Systems (ITSC 2014).

Ayush Dewan, Aravindh Mahendran, Nikhil Soni, K. Madhava Krishna **"Heterogeneous UGV-MAV Exploration Using Integer Programming"** IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2013).

Ayush Dewan, Aravindh Mahendran, Nikhil Soni, K. Madhava Krishna **"Optimization Based Coordinated UGV-MAV Exploration for 2D Augmented Mapping"** Extended abstract at Twelfth International Conference on Autonomous Agents and Multiagent Systems(AAMAS 2013).

See Google Scholar list at https://scholar.google.co.uk/citations?user=lAjGbLMAAAAJ.

ACADEMIC
ACHIEVEMENTS
- Joint Institute Gold Medalist for the batch of 2008 - IIIT Hyderabad.
- Among 35 students nationwide to clear the Indian National Mathematics Olympiad (2007).
- Best Presentation Prize at International Computer Vision Summer School (ICVSS), Sicily, 2015.

TALKS AND
POSTERS

Understanding Deep Image Representations by Inverting Them
- Poster and presentation at ICVSS, Sicily   July 2015
- Seminar at the Computer Vision and Information Technology group, International Institute of Information Technology (IIIT), Hyderabad   Dec. 2015

Ensemble of Exemplar SVM - Convex Relaxation of Latent SVM
Poster and spotlight at the International Workshop on Large Scale Visual Recognition and Retrieval, Part of CVPR 2014   June 2014

WORK
EXPERIENCE

Research Scientist, Google Brain Berlin, Google Germany GmbH   Feb 2019 - Current
Learning from videos; self-supervised learning; object centric learning.

Research Assistant, Carnegie Mellon University   Jan - June 2014
Advisor: Prof. Abhinav Gupta (Robotics Institute, CMU)
Predictive modeling as an unsupervised learning strategy for deep convolutional neural networks.

Exchange Visitor, Viterbi India Program, Univ. of Southern California   May - July 2011
Advisors: Prof. Guarav Sukhatme, Prof. Maja Matarić (University of Southern California)
Point cloud registration using feature matching and using calibration targets.

ACADEMIC
SERVICES

Reviewer: CVPR, ECCV, BMVC, WACV, NeurIPS, PAMI, NNLS, IJCV.
Teaching
- Teaching Assistant (Grader) for undergraduate course on AI (Spring 2011, IIIT Hyderabad)
- Lab demonstrator for B-16 Software Programming lab (Hillary Term 2015, University of Oxford)
- Guest Lecture on Neural Networks for 3YP (Third Year Project Undergraduate Class - Hillary Term 2016, 2017, University of Oxford).

SELECT RESEARCH
PROJECTS

Understanding Deep Image Representations by Inverting Them   Oct. 2014 - 2016
Advisor: Prof. Andrea Vedaldi (University of Oxford)
Experimented with inverting deep CNN representations by solving a per-image optimization problem, regularized by a natural image priors to improve interpretability of the result (CVPR 2015). Our results try to answer the question, "What image does this feature represent?". We generalized the formulation to include neuron maximization and activation enhancement (IJCV 2016). Source codes released on Github - `https://github.com/aravindhm/deep-goggle`.

Bus Detection in Traffic Video   Jan. 2013 - Dec. 2013
Advisors: Prof. Stephen Smith, Prof. Martial Hebert (Robotics Institute, CMU)
Experimented with Exemplar SVMs for bus detection in traffic video data. Achieved 0.84 average precision for bus detection on a dataset built for our application of adaptive traffic scheduling. This project resulted in a paper at ITSC 2014.

OTHER
PROJECTS
Engineering Systems course project: Led a team of 26 members to work towards a set of policies for mitigation, preparedness and response to earthquake disasters in India.

SELECT COURSES
Machine learning, Statistical Machine Learning, Computer vision, Statistical Methods in Artificial Intelligence, Optimization Methods, Linear algebra, Introduction to Cognitive Science.

COMPUTER
SKILLS
Operating systems: GNU/Linux, Windows; **Programming language:** Python; **Deep learning libraries:** Tensorflow, Jax.

EXTRA-
CURRICULAR
ACTIVITIES
Teach Green - Secretary and volunteer for student run project on environmental education for primary school students. `http://oxfordteachgreen.weebly.com/`   Oct. 2014 - May 2017

Yoga Classes - Coordinated between four common rooms and the yoga instructor to organize joint weekly yoga classes at New College, University of Oxford.   Jan. 2016 - July 2017