Sachin Mehta

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Personal Profile

I am a graduate student in the GRAIL lab and the NLP group at the University of Washington, Seattle. I am advised by Prof. Linda Shaprio and Prof. Hannaneh Hajishirzi. My research interest lies in the intersection of computer vision, machine learning, natural language processing, and artificial intelligence, especially designing *fast*, *light-weight*, *power efficient*, and *memory efficient* neural architectures that can power real-world applications on edge devices, including Smartphones. I am also excited about machine vision applications across different domains, including pathology and accessibility.

Education

Doctor of Philosophy, Electrical and Computer Engineering 2015 - (ongoing)

University of Washington - Seattle, WA, USA

Advisors: Linda Shapiro and Hannaneh Hajishirzi

Master of Technology (with distinction), Computer Science 2011- 2014

Coventry University, UK

Bachelor of Technology, Electronics and Communication Engineering 2006 - 2010

Jaypee University of Information and Technology, India **Chancellor's Gold Medal**

Selected Publications

Machine Learning for Computer Vision and NLP

1. **Sachin Mehta**, Marjan Ghazvininejad, Srinivasan Iyer, Luke Zettlemoyer, and Hannaneh Hajishirzi. *DeLighT: Very Deep and Light-weight Transformer*, Under review.
2. **Sachin Mehta**, Hannaneh Hajishirzi, and Mohammad Rastegari. *DiCENet: Dimension-wise Convolutions for Efficient Networks*, Under review.
3. **Sachin Mehta**, Rik Koncel-Kedziorski, Mohammad Rastegari, and Hannaneh Hajishirzi. *DeFINE: Deep Factorized Input Word Embeddings for Neural Sequence Modelling*, International Conference on Learning Representations (**ICLR'20**)
4. **Sachin Mehta**, Mohammad Rastegari, Linda Shapiro, and Hannaneh Hajishirzi. *ESPNetv2: A Light-weight, Power Efficient, and General Purpose Convolutional Neural Network*, IEEE Conference on Computer Vision and Pattern Recognition (**CVPR'19**).
5. **Sachin Mehta**, Rik Koncel-Kedziorski, Mohammad Rastegari, and Hannaneh Hajishirzi. *Pyramidal Recurrent Unit for Language Modeling*, 2018 Conference on Empirical Methods in Natural Language Processing (**EMNLP'18**).
6. **Sachin Mehta**, Mohammad Rastegari, Anat Caspi, Linda Shapiro, and Hannaneh Hajishirzi. *ESPNet: Efficient Spatial Pyramid of Dilated Convolutions for Semantic Segmentation*, European Conference in Computer Vision (**ECCV'18**).
7. **Sachin Mehta**, Amar P. Azad, Saneem A. Chemmengath, Vikas Raykar, and Shivkumar Kalyanraman. *DeepSolarEye: Power Loss Prediction and Weakly Supervised Soiling Localization via Fully Convolutional Networks for Solar Panels*, IEEE Winter conference on Computer Vision (**WACV'18**).

Machine Learning for Medical Imaging

1. **Sachin Mehta**, Ximing Lu, Donald Weaver, Joann G. Elmore, Hannaneh Hajishirzi, and Linda Shapiro. *HATNet: An End-to-End Holistic Attention Network for Diagnosis of Breast Biopsy Images*, Under review.
2. Ezgi Mercan, **Sachin Mehta**, Jamen Bartlett, Linda Shapiro, Donald Weaver, and Joann Elmore. *Assessment of Machine Learning of Breast Pathology Structures for Automated Differentiation of Breast Cancer and High-Risk Proliferative Lesions*, **JAMA Network Open, 2019** (**covered by 100+ news outlets**[1]).
3. Beibin Li, **Sachin Mehta**, Deepali Aneja, Claire Foster, Pamela Ventola, Frederick Shic, and Linda Shapiro. *A Facial Affect Analysis System for Autism Spectrum Disorder*, 26th IEEE International Conference on Image Processing (**ICIP'19**).
4. **Sachin Mehta**, Ezgi Mercan, Jamen Bartlett, Donald Weaver, Joann Elmore, and Linda Shapiro. *Y-Net: Joint Segmentation and Classification for Diagnosis of Breast Biopsy Images*, 21st International Conference On Medical Image Computing and Computer

[1] https://jamanetwork.altmetric.com/details/64776154/news

Assisted Intervention (**MICCAI'18**).

5. **Sachin Mehta**, Ezgi Mercan, Jamen Bartlett, Donald Weaver, Joann Elmore, and Linda Shapiro. *Learning to Segment Breast Biopsy Whole Slide Images*, IEEE Winter conference on Computer Vision (**WACV'18**).

Research and Work Experience

Facebook Reality Labs, Seattle, USA. [Research Intern] Jun 2020 - present

Super-resolution: Developed an efficient CNN-based model that takes a low-resolution compressed input video as an input and produces a perceptually better output. The model can run in real-time on edge devices, such as Smartphones.

Allen Institute for Artificial Intelligence (AI2), Seattle, USA. [Research Intern] Oct 2018 - Mar 2019

Iconary: Developed a CNN-based solution for pictionary-style drawing that takes drawing (partial or full) as an input and produces possible icons corresponding to the drawing *on-the-fly* as an output. These icons are later used for guessing game. This work is under review in Nature.

Online demo: `https://iconary.allenai.org/`.

IBM Research Lab, Bangalore, India. [Research Intern] Jun 2017 - Aug 2017

DeepSolarEye: Developed an end-to-end weakly supervised CNN-based solution for analyzing the impact of soiling on the performance of PV solar panels.

Advanced Micro Devices (AMD), Bangalore, India. [Design Engineer - 2] Jan 2014 - Aug 2015

Performance modeling: Bottleneck analysis using complex system-level workloads, such as PCMark and STREAM, for modeling the performance of next-generation CPU and APU architectures.

Infosys Research Lab, Bangalore, India. [Sr. Software Engineer] Jun 2010 - Dec 2013

Digital fingerprinting: Developed robust and real-time algorithms for embedding and extracting watermarks in digital media, including images, videos, and text documents, for traitor tracing.

Patents

1. **Sachin Mehta**, Vijayaraghavan Varadharajan, and Rajarathnam Nallusamy. *Method, system, and computer-readable medium for embedding and extracting a watermark in a video*,# 9,218,638.
2. **Sachin Mehta** and Rajarathnam Nallusamy, *System for determining illegitimate three dimensional videos and methods thereof*, # 9,202,257.
3. **Sachin Mehta** and Rajarathnam Nallusamy, *Method and system for correction of geometric distortions in a video*, # 9,355,438.
4. **Sachin Mehta** and Rajarathnam Nallusamy, *Method for scene-based video watermarking and devices thereof*, # 9,646,358.

Honors and Awards

- **Award of Innovation**, Infosys Research Labs, 2012.
- **Most Promising Debutante Award**, Infosys Research Labs, Infosys Limited, 2011.
- **Chancellor's Gold Medal** in B.Tech., 2010 (**Rank: 1/300 students**).
- **Certificate of Merit** for highest CGPA in the University (2006-07, 2007-08, 2008-09) (**Rank: 1/300 students**).
- **Certificate of Merit** in Senior Secondary Education (SSE), 2006 (**Rank: 30/75,000$^+$ students**).

Services

- Reviewer for NeurIPS, MICCAI, EMNLP, AAAI, AACL-IJCNLP, IEEE Signal Processing Letters, IEEE Transaction on Multimedia (TMM), IEEE Transaction on Medical Imaging (TMI), IEEE Access, Solar Energy, Journal of the National Cancer Institute, and ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM).
- Member of admissions triage committee, Department of Electrical Engineering, University of Washington, 2017.
- Local Arrangements Coordinator, India-UK Advanced Technology Centre (IUATC) Workshop, 2011.