PAVAN CHENNAGIRI

The University of Texas at Austin

CONTACT INFORMATION

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RESEARCH INTERESTS

Image and Video Processing, Computer Vision, Machine Learning

EDUCATION

The University of Texas at Austin **Aug 2018 - Present**
Doctor of Philosophy in Electrical and Computer Engineering

- **Advisor :** Professor Alan C. Bovik
- **Relevant Courses :** Large Scale Optimization, Genomic Signal Processing, Vision Systems, Regression Analysis, Digital Video

Indian Institute of Science, Bangalore **Aug 2016 - June 2018**
Master of Technology (Research) in Electrical Communication Engineering
Prof. F M Mowadawalla Medal for best Master Thesis - 2018

- **Advisor :** Dr. Rajiv Soundarajan
- **Thesis : Quality Assessment of Stitched Images for Virtual Reality**

National Institute of Technology, Karnataka, Surathkal **July 2012 - May 2016**
Bachelor of Technology in Electronics and Communication Engineering

- **Advisor :** Dr. Deepu Vijayasenan
- **Thesis :** Video Magnification for non-intrusive heart monitoring

WORK EXPERIENCE

Samsung Research America, Mountain View, CA **May 2021 - August 2021**
Research Intern, Mobile Processor Innovation (MPI) Lab *Mentor : Dr. Hamid Sheikh*
Project Title : Synthetic data for computer vision applications

- Designed deep learning based models trained on synthetic data for image enhancement applications. Model for synthetic data generation had low complexity and was easily scalable.

Google, Mountain View, CA **May 2019 - August 2019**
Research Intern, Media Algorithms Team, YouTube *Mentor : Dr. Mohammad Izadi*
Project Title : Real time video denoising for YouTube videos

- Designed real-time video denoising algorithms for user uploaded videos in YouTube. The proposed method had superior processing speed than the existing denoiser
- The method was employed for processing YouTube TV and LIVE videos

RESEARCH EXPERIENCE

Label-free Image and Video Quality Assessment **June 2020 - Present**
Advisor: Prof Alan C Bovik, Electrical and Computer Engineering, UT Austin

- Developing self-supervised models for quantifying image and video quality without using any subjective quality annotations.
- Exploiting inductive bias present in deep Convolutional Neural Networks for quantifying image and video quality.

Frame Rate Dependent Video Quality Assessment **Aug 2018 - May 2020**

Advisor: Prof Alan C Bovik, Electrical and Computer Engineering, UT Austin

- Designed an entropic difference based quality model to capture quality variations due to changes in video frame rate.
- A dataset of 480 videos consisting 6 different frame rates and 5 compression levels was constructed. A subjective study was conducted to obtain subjective quality scores. The proposed model achieved *state-of-the-art* performance on this database.

Quality Assessment of Stitched Images **Aug 2016 - June 2018**

Advisor: Dr.Rajiv Soundararajan, Electrical Communication Engineering, IISc Bangalore

- Constructed a panoramic image database by employing popular stitching algorithms and a human study was conducted to obtain subjective ratings.
- An objective model using natural image statistics was proposed and achieved high correlation with human scores.

PUBLICATIONS

- **P. C. Madhusudana**, N. Birkbeck, Y. Wang, B. Adsumilli and A. C. Bovik. "ST-GREED: Space-Time Generalized Entropic Differences for Frame Rate Dependent Video Quality Prediction," *IEEE Transactions on Image Processing*, August 2021.
- **P. C. Madhusudana**, X. Yu, N. Birkbeck, Y. Wang, B. Adsumilli and A. C. Bovik. "Subjective and Objective Quality Assessment of High Frame Rate Videos," *IEEE Access*, July 2021.
- **P. C. Madhusudana**, X. Yu, N. Birkbeck, Y. Wang, B. Adsumilli and A. C. Bovik. "High Frame Rate Video Quality Assessment using VMAF and Entropic Differences," *Picture Coding Symposium*, July 2021.
- **P. C. Madhusudana**, N. Birkbeck, Y. Wang, B. Adsumilli and A. C. Bovik. "Capturing Video Frame Rate Variations via Entropic Differencing," *IEEE Signal Processing Letters*, Oct. 2020.
- **P. C. Madhusudana** and R. Soundararajan. "Subjective and Objective Quality Assessment of Stitched Images for Virtual Reality," *IEEE Transactions on Image Processing*, Nov. 2019.
- N. K. Lakshminarasimha, **P. C. Madhusudana**, P. Suresha, V. Periyasamy, and P. K. Ghosh. "Multiple spectral peak tracking for heart rate monitoring from photoplethysmography signal during intensive physical exercise," *IEEE Signal Processing Letters*, Dec. 2015.

SKILLS

- Programming: C/C++, Python
- Scientific: MATLAB, PyTorch, Keras, Tensorflow, Halide, LaTeX

ACHIEVEMENTS

- **Prof. F M Mowadawalla Medal** for best Master thesis 2018 awarded by Department of ECE, Indian Institute of Science (IISc) Bangalore.
- Finalist (selected amongst 54 teams across India) in **Qualcomm Innovation Fellowship, India 2017**
- Member of the team which secured 4^{th} position globally in **Signal Processing Cup 2015** conducted by IEEE Signal Processing Society
- Selected in the **Regional Mathematics Olympiad (RMO)** from Karnataka state conducted by Indian Statistical Institute (ISI) Bangalore, during 2011 and 2012.
- Secured *All India rank of 785* (amongst 1,200,000 candidates) in All India Engineering Entrance Examination (AIEEE) 2012.
- Recipient of Ministry of Human Resources Development Scholarship for being ranked in top 0.1% of AIEEE (2012 - 2016)
- Secured 1^{st} *position* in the Karnataka State Class X Secondary Examination (SSLC) in 2010.