# PAVAN CHENNAGIRI

The University of Texas at Austin

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**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**
- **Relevant Courses :** Random Process, Information Theory, Machine Learning, Computer Vision, Advanced Image Processing

**National Institute of Technology, Karnataka, Surathkal** **July 2012 - May 2016**
*Bachelor of Technology in Electronics and Communication Engineering*
**Class Rank - 3** out of 106 Students GPA - 9.6/10

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

**WORK EXPERIENCE**

**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 YouTube TV and LIVE videos

**RESEARCH EXPERIENCE**

**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*

- Developed an automatic quality assessment algorithm for panoramic images suffering from distortions introduced during the stitching process. Algorithm employed Support Vector Machines (SVM) to learn the mapping between features and quality scores.
- Constructed a panoramic image database by employing popular stitching algorithms and a subjective study was conducted to evaluate this dataset to obtain subjective ratings.
- The scores from the developed algorithm correlated very well with human scores obtained during subjective study resulting in state of the art performance.

## PUBLICATIONS

- **Pavan C. Madhusudana**, Neil Birkbeck, Yilin Wang, Balu Adsumilli and Alan C. Bovik. **"ST-GREED: Space-Time Generalized Entropic Differences for Frame Rate Dependent Video Quality Prediction,"** *IEEE Transactions in Image Processing*, Under Review.
- **Pavan C. Madhusudana**, Xiangxu Yu, Neil Birkbeck, Yilin Wang, Balu Adsumilli and Alan C. Bovik. **"Subjective and Objective Quality Assessment of High Frame Rate Videos,"** *IEEE Transactions in Image Processing*, Under Review.
- **Pavan C. Madhusudana**, Neil Birkbeck, Yilin Wang, Balu Adsumilli and Alan C. Bovik. **"Capturing Video Frame Rate Variations via Entropic Differencing,"** *IEEE Signal Processing Letters*, October 2020.
- **Pavan C. Madhusudana** and Rajiv Soundararajan. **"Subjective and Objective Quality Assessment of Stitched Images for Virtual Reality,"** *IEEE Transactions in Image Processing*, vol. 28, no. 11, pp. 5620-5635, Nov. 2019.
- Navaneet K. Lakshminarasimha, **Pavan C. Madhusudana**, Pradyumna Suresha, Vijitha Periyasamy, and Prasanta Kumar Ghosh. **"Multiple spectral peak tracking for heart rate monitoring from photoplethysmography signal during intensive physical exercise,"** *IEEE Signal Processing Letters*, December 2015.

## SKILLS

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

## LEADERSHIP SKILLS

- *Electrical and Electronics Committee* - core committe member - incharge of electronics events during Engineer - 2015 (Annual technical festival of NITK Surathkal).
- *IEEE NITK Chapter* - executive member of IEEE NITK student chapter.

## 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.