Saragadam Raja Venkata, Vishwanath

Postdoctoral Research Associate, Rice University

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Research interests

I am interested in the area of image processing, computer vision, and computational photography. My research is aimed at a novel combination of fast algorithms, concise signal models and efficient optical setups to capture and process visual information that pushes the boundaries of existing imaging techniques.

Education and Employment

Rice University **2020 -**

- PIs: *Prof. Richard G. Baraniuk* and *Prof. Ashok Veeraraghavan*

Carnegie Mellon University **2014 - 2020**

- Advised by *Prof. Aswin Sankaranarayanan* (ECE, CMU) and *Prof. Xin Li* (ECE, Duke University)
- Master of Sciences in Electrical and Computer Engineering, 2014 - 2016.
- Doctorate of Philosophy in Electrical and Computer Engineering, 2014 - 2020
- Thesis title: *Spectrally-Programmable Cameras for Imaging and Inference*

Indian Institute of Technology Madras **2010 - 2014**

- B.Tech(Hons.) in Electrical Engineering with minor degree in Operations Research.
- Recipient of Siemens award for highest GPA in electrical engineering 2014 batch.

Publications

- **V. Saragadam**, M. DeZeeuw, R. Baraniuk, A. Veeraraghavan, A. C. Sankaranaryanan, "SASSI – Super-Pixelated Adaptive Spatio-Spectral Imaging", conditionally accepted to IEEE Transactions on Pattern Analysis and Machine Intelligence, 2021
- A. Yang, F. Pan, **V. Saragadam**, D. Dao, Z. Hui, J. Rick Chang, A. C. Sankaranarayanan, "SliceNets – A Scalable Approach for Object Detection in 3D CT Scans", IEEE Winter Conference on Applications of Computer Vision, 2021
- **V. Saragadam**, and A. C. Sankaranarayanan, "On Space-Spectrum Uncertainty Analysis for Coded Aperture Systems", OSA Optics Express, 28 (6) 7771 - 7785, 2020
- **V. Saragadam**, A. C. Sankaranarayanan, "Programmable spectrometry – per-pixel material classification using learned spectral filters", IEEE International Conference on Computational Photography, 2020
- **V. Saragadam**, J. Wang, M. Gupta, S. Nayar, "Micro-baseline Structured Light", IEEE International Conference on Computer Vision, 2019
- **V. Saragadam**, and A. C. Sankaranarayanan, "KRISM – Krylov subspace-based optical computation of hyperspectral images", ACM Transactions on Graphics, 38 (5), 1 - 14, 2019
- **V. Saragadam**, A. C. Sankaranarayanan, "Wavelet tree parsing with freeform lensing", IEEE International Conference on Computational Photography, 2019
- **V. Saragadam**, A. C. Sankaranarayanan, X. Li, "Cross-scale predictive dictionaries", IEEE Transactions on Image Processing, 28 (2) 803 - 814, 2019
- **V. Saragadam**, J. Wang, X. Li, A. C. Sankaranarayanan, "Compressive spectral anomaly detection", IEEE International Conference on Computational Photography, 2017
- **V. Saragadam**, A. C. Sankaranarayanan, X. Li, "Cross-scale predictive dictionaries for image and video restoration", IEEE International Conference on Image Processing, 2016

Awards / Honors

- Recipient of the A. G. Jordan outstanding thesis award in the ECE department at CMU.

- ACM SIGGRAPH 2020 thesis fast forward finalist for entry titled, "Spectrally-programmable cameras for imaging and inference".
- Recipient of *Prabhu and Poonam Goel Graduate fellowship* for the academic year 2018/19 at CMU.
- Recipient of the Outstanding Teaching Assistant award of 2018 in the ECE department at CMU.
- Recipient of Dean's tuition fellowship for graduate studies at CMU.
- Recipient of the *Shri V Rajagopalan Memorial award* and *M Sankaraiah and M Saradah scholarship* for outstanding performance in sophomore year in electrical engineering.

Conferences and workshops

- Invited talk at Asilomar Conference on Signals, Systems, and Computers on "Adaptive Imaging and Spectroscopy", 2019, held in Pacific Grove, California.
- Presented poster on "Micro-Baseline Structured Light" at International Conference on Computer Vision, 2019, held in Seoul, South Korea.
- Presented poster on "Programmable spectrometry – per-pixel material classification using learned spectral filters" at International Conference on Computational Photography, 2019, held in Tokyo, Japan.
- Presented paper on "Wavelet tree parsing with freeform lensing" at International Conference on Computational Photography, 2019, held in Tokyo, Japan.
- Invited talk at Johns Hopkins University, and University of Maryland on "KRISM – Krylov subspace-based optical computing of hyperspectral images", 2018.
- Presented poster on "KRISM – Krylov subspace-based optical computing of hyperspectral images" at ICARS workshop, 2018.
- Presented demo on "KRISM – Krylov subspace-based optical computing of hyperspectral images" at International Conference on Computational Photography, 2018, held in Carnegie Mellon University, Pittsburgh.
- Presented paper on "Compressive spectral anomaly detection" at International Conference on Computational photography, 2017, held in Stanford University, California.
- Invited talk on "Cross-scale predictive dictionaries", Indian Institute of Technology Madras.
- Invited talk at International Institute of Information Technology, Hyderabad, India on "Sparse representations and its applications", 2017.
- Presented paper on "Cross-scale predictive dictionaries for image and video restoration" at International Conference on Image Processing, 2016, held in Phoenix, Arizona.

Internship

Snap Inc., New York City, New York **May - August 2018**

- Worked on Augmented Reality hardware under the guidance of Shree Nayar, and Prof. Mohit Gupta (University of Wisconsin Madison).

Intel corporation, Santa Clara, California **May - August 2015**

- Worked on convolutional sparse coding for recognition tasks.

Maschinenfabrik Reinhausen GmbH, Regensburg, Germany **May - July 2013**

Sasken Communication Technologies, Chennai, India **May - July 2012**

Professional activities

- Reviewier: ACM SIGGRAPH, IEEE ISIT, IEEE ICCP, IEEE CVPR, COMSNET, WACV, BMVC, ACCV, IEEE TPAMI, Nature Scientific Reports, OSA Optics Letters.
- Web chair for International Conference on Computational Photography (ICCP) 2018, held in Carnegie Mellon University.
- Volunteer for "Camera workshop" as part of Gelfand Outreach Program at CMU in 2016, 2017 and 2018.
- IEEE student member of Signal Processing Society.

Teaching experience

- TA for "Signals and Systems" at Carnegie Mellon University under Prof. Grover and Prof. Yu, 2015, 2017.
- TA for "Image and Video Processing" at Carnegie Mellon University under Prof. Sankaranarayanan, 2016, 2018.

Skills

- **Computer languages:**
  - Proficient at coding in C, C++, Python, Cython and Matlab.
  - Working knowledge of VHDL, Verilog, Assembly(8051, ARM), CUDA and PLC ladder logic.
- **Computer tools and platforms:**
  - Proficient at Microsoft Office, Autodesk 3ds Max, Spice opus and LaTeX.
  - Working knowledge of AutoCAD, Xilinx IDE, keil μVision, Modelsim and Bachmann PLC platform.