Suhas Sreehari

Computational Imaging PhD Candidate at Purdue University

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Seeking a full-time research position or a post-doctoral position where I can work on real-life computational imaging problems at both algorithmic and implementation levels – leveraging my research experience with image modeling and reconstruction, machine learning, simulation, and optimization.

Education

Ph.D. (ECE), Purdue University (Advisor: Prof. Charles A. Bouman) [current]
M.S. (ECE), University of Windsor, Canada [2012]
B.E. (Telecomm. Engg.), B.M.S. College, V.T.U., India [2010]

Skills

Programming languages: C, C++, MATLAB, Python.
Software platforms: Xilinx, Altera Quartus II, NI LabVIEW, NI Vision Assistant, Cadence.
Documentation platforms: LaTeX, MS Office, Open Office, Beamer.

Experience

Research Intern, Siemens Healthcare, Princeton, NJ [05/2016 – 08/2016]
Image Processing Research Assistant, Purdue University, West Lafayette [2013 – current]
Mathematics Instructor, Purdue University [2012 – 2013]
Cryptography Research Assistant, Univ. of Windsor, Canada [2010 – 2012]
ECE Graduate Teaching Assistant, Univ. of Windsor [2010 – 2012]

Research Projects

Purdue

1. Developed an ADMM-based proximal method to incorporate modern denoising filters as prior models in inverse imaging problems – such as tomography, microscopy, etc.
2. Developed inpainting algorithm with spatio-temporal generalized Gaussian Markov random field prior for high-speed laser microscopy imaging.
3. Developed a computationally-efficient rotationally-invariant non-local means algorithm for image denoising.
4. Library-based reconstructions for super-resolution and image interpolation of biological and material nano-structures.

U. Windsor

5. Designed an efficient algorithm and implementation scheme for large integer modular exponentiation. I derived a class of (quasi-Mersenne) prime numbers which was integral to the speed-up of modular reduction.

V.T.U. India

6. Built an OCR-based linguistic translator to translate documents from a regional Indian language with non-Latin script to English, endowed with grammar compatibility. This was adjudged the best undergraduate senior year project.

Invited talk

Sparse non-local interpolation for nano-scale imaging, *IS&T Electronic Imaging*, Feb 2016.

U.S. Patent

Co-inventor, “High frame-rate multichannel beam-scanning microscopy” (pending), 2016.

Journal Publications

1. **S. Sreehari**, et al., "Plug-and-Play Priors for Bright Field Electron Tomography and Sparse Interpolation," *IEEE Transactions on Computational Imaging*, 2016.
2. S. Z. Sullivan, R. D. Muir, J. A. Newman, M. S. Carlsen, **S. Sreehari**, C. Doerge, N. J. Begue, R. M. Everly, C. A. Bouman, and G. J. Simpson, "High frame-rate multichannel beam-scanning Microscopy based on Lissajous trajectories," *Optics Express, Vol. 22, Number 20, pp. 24224–24234*, Oct 2014.
3. **S. Sreehari**, H. Wu, and M. Ahmadi, "Application of New Classes of Mersenne Primes for Fast Modular Reduction for Large-Integer Multiplication," *International Journal of Cyber-Security and Digital Forensics (IJCSDF), 1:1, pp. 15–19* , 2012.

Conference Papers

1. **S. Sreehari** et al., "Library-Based Sparse Interpolation and Super-Resolution of S/TEM Images of Biological and Material Nano-Structures," *Microscopy and Microanalysis (M&M '16)*, July 2016. [**Presidential Scholar Award**]
2. **S. Sreehari** et al., "Model-Based Super-Resolution of SEM Images of Nano-Materials," *Microscopy and Microanalysis (M&M '16)*, July 2016.
3. G. Simpson, S. Sullivan, R. Muir, J. Newman, **S. Sreehari**, and C. Bouman, "Multi-modal kHz frame rate multi-photon microscopy pairing Lissajous trajectory beam-scanning with model-based image reconstruction," *Electronic Imaging*, Feb 2016.
4. **S. Sreehari** et al., "Exploiting Redundancy in Microscope Observations to Produce Sharper Tomographic Reconstructions", *Proceedings of the Material Research Society Fall Meeting*, Dec 2015.
5. **S. Sreehari** et al., "Rotationally invariant non-local means for image denoising and tomography," *IEEE Intl. Conference on Image Processing (ICIP)*, Sep 2015.
6. **S. Sreehari** et al., "Non-local Prior Modeling for Tomographic Reconstruction of Bright Field Transmission Electron Microscopy Images," *Microscopy and Microanalysis (M&M '15)*, Aug 2015.
7. **S. Sreehari** et al., "Generations of spatial constraints for electron tomographic reconstruction," *NSRC workshop for Big, Deep, and Smart Data Analytics in Materials Imaging*, June 2015.
8. J. A. Newman, S. Z. Sullivan, R. D Muir, **S. Sreehari**, C. A. Bouman, and G. J. Simpson, "Multi-Channel Lissajous Trajectory Beam-Scanning Microscopy for High Frame Rate 2D and 3D Imaging," *PittCon*, March 2015.
9. **S. Sreehari** et al., "Advanced prior modeling for 3D bright field tomography," *SPIE Computational Imaging XIII*, Feb 2015.
10. J. A. Newman, S. Z. Sullivan, R. D. Muir, **S. Sreehari**, C. A. Bouman, and G. J. Simpson, "Multi-channel beam-scanning imaging at kHz frame rates by Lissajous trajectory microscopy," *SPIE Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XXII*, Feb 2015.
11. **S. Sreehari** et al., "Fast modular reduction for large-integer multiplication for cryptosystem application," *IEEE International Conference on Digital Information and Communication Technology and its Applications (DICTAP), pp. 226–229*, May 2012.
12. S. Kubatur, **S. Sreehari**, and R. Hegde, "An Image Processing Approach to Linguistic Translation," *American Institute of Physics International Conference on Methods and Models in Science and Technology (ICM2ST), Vol. 1414, pp. 172–177*, Dec 2011.

Achievements + Awards + Service

1. Finalist, 3-minute thesis (3MT) presentation contest, Quebec, Canada [Sep 2015]
2. Reviewer for IEEE Trans. Image Proc., several IEEE conferences [2014 - now]
3. Rank 1, Purdue ECE qualifying exam in signal processing area [2013]
4. Significant contributor to math challenge problems, Purdue University [2013]
5. International Graduate Student Scholarship, University of Windsor, Canada [2010–12]
6. Mathematics talent award, B.M.S. College of Engineering, India [2009]
7. National Talent Scholar (Govt. of India science scholarship) – Rank: 14 [2003 – 2005]