PREETI GOPAL

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Researcher

Image and signal processing, medical image computing

RESEARCH SUMMARY

As part of my PhD thesis, I developed algorithms for reconstruction of 3D volumes from their Computed Tomography (CT) measurements obtained from sparse projection views and low-dose imaging. The sub-problems I worked on include: intelligent grouping of 2D slice measurements, incorporating the use of data-specific information in longitudinal studies and integrating the above within a compressed sensing reconstruction framework.

EDUCATION

IITB-Monash Research Academy *Defended: Jan 31, 2020*
Ph.D. in Computer Science & Engineering (IIT Bombay)
School of Physics and Astronomy (Monash University)
Overall Course GPA: 8.33/10

Indian Institute of Technology Bombay *June 2012*
M.Tech in Electrical Engineering
Communications and Signal Processing
Overall GPA: 8.7/10

Pondicherry Engineering College *June 2008*
B.Tech in Electronics and Communications Engineering
Overall GPA: 8.83/10

INDUSTRY EXPERIENCE

Healthcare Technology Innovation Centre Aug 2012 - June 2014
Project Engineer *IIT Madras Research Park, Chennai*

- Project in-charge for an industry collaborated project in ophthalmic image computing
- Developed and implemented algorithms for detection of anatomical and abnormal structures present in retinal images of the eye
- Acquired skills in image processing, statistical pattern recognition, graphical interface development, domain understanding in ophthalmic imaging and disease analysis

Robert Bosch Engineering and Business Solutions Ltd. July 2008 - Nov 2009
Associate Software Engineer *Coimbatore*

- Software development in C for parts of Electronic Control Units in medium weight vehicles

SKILLS

- **Languages:** C, Python, MATLAB
- **Packages:** OpenCV
- **Operating System:** Linux, Windows

MAJOR COURSES TAKEN

- **During Ph.D:** Algorithms and Complexity, Software Lab, Applied Linear Algebra, Math for Visual Computing, Linear Optimization, Medical Image Computing
- **Online:** Python Data Structures, Python for Machine Learning
- **During Masters:** Digital Signal Processing, Image Processing, Computer Vision, Adaptive Signal Processing, Computer Graphics, Statistical Signal Analysis

PUBLICATIONS

Journals

· **Preeti Gopal**, Sharat Chandran, Imants Svalbe and Ajit Rajwade, *Low radiation tomographic reconstruction with and without template information*, Signal Processing (Elsevier), 2020

· **Preeti Gopal** and Imants Svalbe, *Spatial domain morphological filtering for interpolation of the Fourier domain*, Pattern Recognition Letters, December 2018

· A journal on few-views imaging is under review with IEEE Transactions on Computational Imaging.

Conferences

· **Preeti Gopal**, Sharat Chandran, Imants Svalbe and Ajit Rajwade, *Low Dose Tomography: Poisson-Gaussian Convolution-based Reconstruction*, an abstract, International Symposium on Biomedical Imaging (ISBI), 2019

· **Preeti Gopal**, Sharat Chandran, Imants Svalbe and Ajit Rajwade, *Tomography in Longitudinal Studies: Detecting New Structures from Sparse Measurements*, an abstract, International Symposium on Biomedical Imaging (ISBI), 2019

· **Preeti Gopal**, Ritwick Chaudhry, Sharat Chandran, Imants Svalbe and Ajit Rajwade, *Tomographic reconstruction using global statistical priors*, Digital Image Computing: Techniques and Applications (DICTA), December 2017

· **Preeti Gopal**, David Bailey and Imants Svalbe, *Nonlinear Interpolation in the Fourier Domain Guided by Morphologic Filters*, Digital Image Computing: Techniques and Applications (DICTA), December 2017

· **Preeti Gopal**, Sharat Chandran, Imants Svalbe and Ajit Rajwade, *Multi-slice tomographic reconstruction: to couple or not to couple*, Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP), December 2016

· **Preeti Gopal**, Ajit Rajwade, Sharat Chandran and Imants Svalbe, *A Comparison of Some Methods for Direct 2D Reconstruction from Discrete Projected Views*, Discrete Geometry for Computer Imagery (DGCI), April 2016

· Sajith K, **Preeti Gopal** and Subhasis Chaudhuri, *Hand Tremor Analysis using Deformable Object Manipulation in a Haptic Environment*, IEEE Point-of-Care Healthcare Technologies (PHT), January 2013

PATENT

- *Method and system for performing ophthalmic image analysis*: Niranjan Joshi, Keerthi Ram, Mohanasankar Sivaprakasam, **Preeti Gopal**, Vaanathi Sundaresan and Garima Gupta at Healthcare Technology Innovation Centre, IITM Research Park, Chennai, 2013