Prasad S Murthy

CONTACT INFORMATION

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PROFILE

I have ∼12 years of experience in conducting research and designing solutions for problems in machine intelligence using tools from signal/image processing and deep learning/AI. In the last 8 years, the focus has been on problems involving medical images. My research interests include inverse problems, model driven deep learning, data-efficient learning, etc. Apart from value generation through IP and publications, I am engaged in translating AI research prototypes into real-world deployable applications.

Since August 2022, I am also a visiting faculty at the Department of Computational and Data Sciences (CDS), IISc, Bangalore.

RESEARCH EXPERIENCE

1. *Staff Scientist*, Advanced Technology Group, **GE HealthCare**, Bangalore, India. **March 2019 - till date**

2. *Research Scientist*, AI and Image Analytics, **GE Global Research**, Bangalore, India. **October 2014 - February 2019**

3. *Postdoctoral research assistant*, **Univérsité catholique de Louvain**, Belgium **September, 2011 - May, 2014**

4. *Visiting researcher* **Ecole Polytechnique Federale de Lausanne**, Switzerland **January 2011**

MENTORSHIP

1. **PhD supervisor** - *Hariharan Ravishankar*, CDS, IISc, Bangalore; since August 2020
2. **VTU nominee** - Board of Studies for the Department of AI/ML, RV College of Engineering, Bangalore; since June 2022
3. **Course instructor** - Centre for Continuing Education, IISc, Bangalore; since August 2020

EDUCATION

- **Ph.D.**, INRIA Rennes - Bretagne Atlantique, Rennes, France, 2011
- **M.Sc.(Engg.)**, Indian Institute of Science, Bangalore, India, 2007
- **B.E.**, Computer Science and Engineering, Bangalore University, India, 2000

PAST EMPLOYMENT

1. **Applied Research Lab, Satyam Computers**, Bangalore, India, 2006-2007
2. **Inspiration Technologies Pvt. Ltd.**, Bangalore, India, 2003
3. **Ittiam Systems**, Bangalore, India, 2001-2002
4. **Robert Bosch India Limited**, Bangalore, India, 2000-2001

PUBLICATIONS

Deep Learning and AI

1. H. Ravishankar, N. Paluru, P. Sudhakar and P. Yalavarthy, Inference Time Adaptation for Retinal Disease Diagnosis using Optical Coherence Tomography Images, submitted to Biomedical Optics Express, 2023.
2. H. Ravishankar, R. Patil, D. Anand, V. Singhal, U. Agrawal, R. Venkataramani and P. Sudhakar, Stochastic Weight Perturbations along the Hessian: A Plug and Play Method to Compute Uncertainty, in UNSURE-MICCAI 2022, Singapore.

3. D. Anand, P. Annangi and P. Sudhakar, Benchmarking Self-Supervised Representation Learning from a Million Cardiac Ultrasound Images, in EMBC 2022, Glasgow, Scotland.
4. P. Annangi, P. Sudhakar and M. Washburn, From 2D Ultrasound to Patient-Specific 3D Surface Models for Interventional Guidance, in EMBC 2022, Glasgow, Scotland.
5. H. Ravishankar, P. Sudhakar and P. Yalavarthy, Unsupervised Inference-Time Patient Specific Adaptation Method for Generalized Deep Semantic Segmentation, submitted to IEEE Journal of Biomedical and Health Informatics.
6. D. Anand, R. Patil, U. Agrawal, R. Venkataramani and P. Sudhakar Towards Generalization of Medical Imaging AI-models: Sharpness-aware minimizers and beyond, ISBI 2022.
7. P. Sudhakar, R. Langoju, A. Narayanan, V. Chaugule, V. Amilneni, P. Cheerankal and B. Das. Self-supervised Deep Learning for CT Deconvolution, SPIE Medical Imaging 2021.
8. U. Agrawal, A. Hegde, R. Langoju, P. Sudhakar, B. D. Patil, R. K. Sundar and B. Das, Enhancing z-resolution in Axial CT Volumes with Deep Residual Learning, SPIE Medical Imaging 2021.
9. H Ravishankar, R Venkataramani, S Anamandra, P Sudhakar and P Annangi, Feature Transformers: Privacy Preserving Lifelong Learners for Medical Imaging, in MICCAI 2019, Shenzen, China.
10. H. Ravishankar, R. Venkataramani, S. Thiruvenkadam, P. Sudhakar and V. Vaidya, Learning and incorporating shape models for semantic segmentation, in MICCAI 2017, Québec city, Canada.
11. R. Venkataramani, S. Thiruvenkadam, P. Sudhakar, H. Ravishankar and V. Vaidya, Filter sharing: Efficient learning of parameters for volumetric convolutions, in NIPS workshop on Machine Learning for Healthcare, 2016, Barcelona, Spain.
12. H. Ravishankar, P. Sudhakar, R. Venkataramani, S. Thiruvenkadam, P. Annangi and N. Babu and V. Vaidya, Understanding the Mechanisms of Deep Transfer Learning for Medical Images, DLMIA workshop, MICCAI 2016, Athens, Greece.

Sparsity and Compressed Sensing

13. P. Sudhakar, L. Jacques, X. Dubois, P. Antoine and L. Joannes, Compressive imaging and characterization of sparse light deflection maps, SIAM Journal on Imaging Sciences, 8(3), 1824-1856, 2015.
14. P. Sudhakar, L. Jacques, A. Gonzalez, X. Dubois, P. Antoine and L. Joannes, Compressive acquisition of sparse deflectometric maps, in SampTA 2013, Bremen, Germany.
15. A. Benichoux, P. Sudhakar, F. Bimbot and R. Gribonval, Well-posedness of the frequency permutation problem in sparse filter estimation with ℓ^p minimization, Applied and Computational Harmonic Analysis, 35(3), pp. 359-540, November 2013.
16. P. Sudhakar, L. Jacques, X. Dubois, P. Antoine and L. Joannes, Compressive schlieren deflectometry, in Acoustics, Speech and Signal Processing, IEEE International Conference on (ICASSP 2013), Vancouver, Canada.
17. A. Benichoux, P. Sudhakar and R. Gribonval, Well-posedness of the frequency permutation problem in sparse filter estimation with ℓ^p minimization, in SPARS'11, Edinburgh, Scotland, June 27-30, 2011.

Signal and Image Processing

18. A. Adiga, S. Mulleti, P. Sudhakar and C. S. Seelamantula, Two-Dimensional FRI Signal Reconstruction Using Blind Deconvolution, SampTA 2015, Lausanne, Switzerland.
19. P. Sudhakar and P. K. Ghosh, Recognition benefit of articulatory features from acoustic-to-articulatory inversion using sparse smoothing, INTERSPEECH 2014, Singapore.
20. P. Sudhakar, L. Jacques and P. K. Ghosh, A sparse smoothing approach for Gaussian mixture model based acoustic-to-articulatory inversion, ICASSP 2014, Florence, Italy.
21. S. Prasad and K. R. Ramakrishnan, On resampling detection and its application to detect image tampering, in IEEE International Conference on Multimedia and Expo (ICME 2006), July 2006.

Blind Source Separation

22. A. Benichoux, P. Sudhakar, F. Bimbot and R. Gribonval, Some uniqueness results in sparse convolutive source separation, in International Conference on Latent Variable Analysis and Source Separation, Mar 2012, Tel Aviv, Israel.
23. S. Arberet, P. Sudhakar and R. Gribonval, Estimating multiple filters from stereo mixtures: a double sparsity approach, in SPARS'11, Edinburgh, Scotland, June 27-30, 2011.
24. S. Arberet, P. Sudhakar and R. Gribonval, Wideband Doubly-Sparse Approach for MITO Sparse Filter Estimation, in Acoustics, Speech and Signal Processing, IEEE International Conference on (ICASSP 2011), May 2011.
25. P. Sudhakar, S. Arberet and R. Gribonval, Double Sparsity: Towards Blind Estimation of Multiple Channels, in Latent Variable Analysis and Signal Separation, 9th International Conference on (LVA/ICA2010), September 2010.
26. P. Sudhakar and R. Gribonval, Sparse filter models for solving permutation indeterminacy in convolutive blind source separation, in SPARS'09 - Signal Processing with Adaptive Sparse Structured Representations, April 2009.
27. P. Sudhakar and R. Gribonval, A sparsity-based method to solve the permutation indeterminacy in frequency domain convolutive blind source separation, in ICA 2009, 8th International Conference on Independent Component Analysis and Signal Separation, March 2009.

Neuroscience

28. P. Sudhakar, R. Madhavan, R. Mullick, E. T. Tan and S. Joel, Method to functionally parcellate the brain consistently across subjects, Human Brain Mapping 2016, Geneva, Switzerland.
29. P. Sudhakar, R. Madhavan, R. Mullick, E. T. Tan and S. Joel,, Reproducibility of group spectral clustering of the sensorimotor cortex, Human Brain Mapping 2016, Geneva, Switzerland.

PATENTS

17 filed; 3 granted.

OTHER INFORMATION

Reviewer

- Nature Scientific Reports, MICCAI, IEEE TCSVT, IEEE ICASSP, ICIP, SampTA, SPCOM