Debdoot Sheet

N 201, Department of Electrical Engineering
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Personal Statement

My research is focused on developing machine learning algorithms with deep neural networks and graphical models for visual computing including medical image analysis and surgical informatics.

Education

PhD, School of Medical Science and Technology — Oct. 2010 - Mar. 2014
Indian Institute of Technology Kharagpur, WB, India

- **Major:** Computational Medical Imaging and Image Computing
- **Thesis:** Computation Modelling of Tissue Energy Interaction in Acoustic and Optical Imaging for *In situ* Diagnostic Histopathology

MS, School of Medical Science and Technology — July 2008 - Aug. 2010
Indian Institute of Technology Kharagpur, WB, India

- **Major:** Computer Vision and Pattern Recognition in Medicine
- **Thesis:** Feature Usability Index

B. Tech, Electronics and Communication Engineering — July 2004 - May 2008
West Bengal University of Technology, Kolkata, India

- **Major:** Electronics and Communication Engineering
- **Thesis:** RFID System Design and Application

Positions

Indian Institute of Technology Kharagpur, Department of Electrical Engineering
- *Assistant Professor* — Jul. 2014 – Present

SkinCurate Research Private Limited
- *Founder and Managing Director* — Feb. 2014 - Present

IEEE
- *Editor,* IEEE Pulse — Feb. 2014 - Present
- *Editor-in-Chief,* IEEE Technology in Engineering Education — Feb. 2014 – Oct. 2015

Technical University of Munich, Computer Aided Medical Procedures / Informatics
- *Visiting Scientist* (Host: Prof. Dr. Nassir Navab, Sponsor: DAAD) — Oct. 2011 - Sept. 2012

Indian Institute of Technology Kharagpur, School of Medical Science and Technology
- *Senior Research Fellow* (Host: Prof. Jyotirmoy Chatterjee) — Jan. 2013 – Dec. 2013
- *Research Consultant* (Host: Prof. Jyotirmoy Chatterjee) — Oct. 2012 - Dec. 2012
- *Senior Scientific Officer* (Host: Prof. Jyotirmoy Chatterjee) — Sept. 2010 - May 2011
- *Senior Project Assistant* (Host: Prof. Ajoy K. Ray) — Jul. 2008 - Aug. 2010

Research Areas

- **Medical image analysis, imaging and visualization:** Ultrasonic and optical tissue characterization, machine learning of tissue-energy interaction, probabilistic graphical models for image segmentation, random walker, active contour, systematic evaluation and validation, digital angiography, digital pathology, live-cell imaging, virtual-/augmented reality, surgical tool tracking, interventional navigation guidance.
- **Image and multidimensional signal processing:** Stochastic noise models in medical imaging, image denoising, artefact removal, bilateral filtering, non-local means, fuzzy statistics, vector order statistics, computer graphics and visualization, shape models, image registration, compositing, camera and sensor calibration.
- **Machine learning:** Domain adaptation for learning with interdependent and non-identically distributed data; Deep, transfer and ensemble learning for discriminative pattern segmentation, classification, regression in high-dimensional, large, sparsely or approximately labelled data; learning with parallel computing and CPU-GPU handshaking; generative models and adversarial learning; temporal deep learning; reinforcement learning.
- **Physics of medical imaging:** Statistical physics of ultrasonics, optical coherence tomography, multispectral optical microscopy, ophthalmoscopy, x-ray mammography.

Members of Professional Societies

- IEEE (Member)
  - Engineering in Medicine and Biology Society
  - Signal Processing Society
  - Computer Society
  - Standards Association
- ACM (Member)
- SPIE (Member)
- IUPRAI (Life Member)
- BMESI (Life Member)

Collaborations

TU Munich, Germany; Columbia University, New York, USA; UZ Brussels, Belgium; Medical College and Hospitals Kolkata; SOA University and SUM Hospital Bhubaneswar; Narayana Nethralaya Bangalore; Apollo Hospitals Kolkata; Intel; NVIDIA; Samsung; Texas Instruments; i2i TeleSolutions and TeleMedicine; i2Sense

Awards

- Distinguished Young Alumnus Award 2016 (Dec. 2016), IEM-UEM Kolkata.
- GE Edison Challenge 2013 (Dec. 2013), (Award ₹ 10,00,000)
- Young Scientist Travel Grant (Apr. 2013), DST, Govt. of India (Award ₹ 1,96,000)
- Fraunhofer Applications Award (Oct. 2012), Indo-German Grand Science Slam.
- IEEE Computer Society 2012 Richard E. Merwin Student Scholarship (Award $ 1,250).
- Sandwich Model PhD Scholarship (2011-2012), DAAD (Award € 18,000).

Grant Writing Experiences

- MIRIAD: Many Incarnations of Screening Radiology for High Throughput Disease Screening via Multiple Instance Reinforcement Learning with Adversarial Deep Neural Networks. Investigators: Debdoot Sheet, Nirmalya Ghosh, Ramanathan Sethuraman, Agency: Intel Technology India Pvt. Ltd. Grant awarded: INR 1,05,00,000.00
- Computed Super-Resolution Optical Coherence Tomography. Investigators: Debdoot Sheet. Sponsor: Sponsored Research and Industrial Consultancy Cell, Indian Institute of Technology Kharagpur. Grant awarded: INR 27,22,000.00.
- Multispectral Optical Imaging and Computing Technologies for Realtime In situ Functional Characterization and Monitoring of Cutaneous Wound Healing Progression. Investigators: Debdoot Sheet, Kausik Basak, Sri Phani Krishna Karri, Tamoghna Ojha. Sponsor: Biotechnology Industry Research Assistance Council (BIRAC), Govt. of India. Grant awarded: INR 42,00,000.00.

- Integrated Application of Multimodal Optical Coherence Tomography and Multispectral Imaging for Spatio-functional Characterization of Skin towards Achieving In situ Functional Histology. Investigators: Jyotirmoy Chatterjee, Debdoot Sheet, Ajoy Kumar Ray. Sponsor: Department of Biotechnology, Govt. of India. Grant awarded: INR 35,00,000.00.
- GPU Education Centre at Indian Institute of Technology Kharagpur. Investigator: Debdoot Sheet. Sponsor: NVIDIA. Grant awarded: US$ 3,000.00 per year.
- Computational modelling of ultrasonic backscattering statistical physics for in situ tissue characterization. (Multi-institutional research project) Investigators: Amin Katouzian, Nassir Navab (TU Munich), Debdoot Sheet, Jyotirmoy Chatterjee, Ajoy Kumar Ray (IIT Kharagpur). Sponsor: Samsung Advanced Institute of Technology through the Samsung GRO Award 2013. Grant awarded: US$ 100,080.00.
- Skin lesion diagnosis with in situ imaging and characterization through learning of multispectral signatures for augmentation of clinical Insight in effective rural healthcare delivery. Investigators: Debdoot Sheet, Kausik Basak, Sri Phani Krishna Karri, Tamoghna Ojha. Sponsor: GE through the GE Edison Challenge 2013. Grant awarded: INR 10,00,000.00.

Other Professional Contributions

- Reviewer for Journals, Transactions and Magazines
  - Nature Communications (2017)
  - IEEE Trans. Medical Imaging (2013)
  - IEEE Trans. Image Processing (2011)
  - IEEE J. Biomedical and Health Informatics (2014)
  - SPIE J. Medical Imaging (2015)
  - IET Image Processing (2010)
  - Computer Methods and Programs in Biomedicine (2014)
  - PLOS One (2016)
  - Neurocomputing (2011)
  - Int. J. Biomedical Imaging (2014)
  - IEEE Technology in Engineering Education (2010)
  - IEEE Potentials (2009)
- Special Session Organizer, ISBI (2016), ICIIS (2015)
- Technical Program Committee, IEEE TechSym (2011,2014), ICIIS (2014, 2015, 2017), ICSMB (2016)
- Publications Chair, IEEE TechSym (2010)
- Steering Committee Member, IEEE TechSym (2010, 2011, 2014, 2016)
- Proposal Reviewer
  - Science and Engineering Research Board (SERB), DST, Govt. of India (2015)

Invited Talks, Workshops and Special Sessions

- Deep Learning for Visual Computing Summer School 2017 – IIT Kharagpur Kolkata Campus, 2-8 July 2017.
- Domain Adaptation in Deep Neural Networks (Webinar) - Indian Deep Learning Initiative (Google Hangout on the Air / Youtube Live), 4 June 2017.
- Learning to Adapt between Domains with Generative Models (Keynote speech) - Deloitte US-India Meet, Hyderabad, 21 May 2017.
- Domain adaptation for learning with interdependent and non-identically distributed data (Keynote speech) - 3rd Int. Conf. Bio-signals, Images and Instrumentation, SSN College of Engg., Chennai, 18 March 2017.
- Systematic Evaluation and Validation + Domain Adaptation for learning with interdependent and non-identically distributed data – VIT College of Engineering, Pune, 23 December 2016.
- Jaunt on the Manifold of Latent Variables in a Deep Neural Network – from domain adaptation to pathology simulation in medical images – Intel India Research Colloquium, Bangalore, 20 October 2016.

- Introduction to Deep Neural Networks + A practical guide to learning Autoencoders, Demystifying Autoencoders + Domain Adaptation for learning with interdependent and non-identically distributed data – C. V. Raman College of Engineering, Bhubaneswar, 14 July 2016.
- Machine Learning for Medical Image Analysis (Keynote) + Decision Trees and Random Forests + Deep Neural Networks + Domain Adaptation + Medical Augmented Reality – Indian Institute of Technology Mandi, 18-22 June 2016.
- Introduction to Deep Learning + A practical guide to learning Autoencoders, Demystifying Autoencoders + Domain Adaptation for learning with interdependent and non-identically distributed data – SOA University, Bhubaneswar, 11-13 May 2016.
- Tutorial on Deep Learning – 2016 IEEE International Symposium on Biomedical Imaging (ISBI), Prague, Czech Republic, 13-16 April 2016.
- Special Session on "Deep Learning for Biomedical and Biological Imaging and Image Analysis" - 2016 IEEE International Symposium on Biomedical Imaging (ISBI), Prague, Czech Republic, 13-16 April 2016.
- Machine Learning for Medical Image Analysis + Introduction to Deep Learning + Decision Trees and Random Forests – SOA University, Bhubaneswar, 23 December 2015.
- Deep Learning for Image Analysis – 2015 International Conference on Industrial Information Systems (ICIIS), University of Peradeniya, Sri Lanka, 17-20 December 2015.
- Deep Learning and Self Hierarchical Learning - Technical University of Munich, Germany at the München Computer Vision & Medical Image Analysis Meetup, 24 August 2015.
- Introduction to Deep Learning, A practical guide to learning Autoencoders, Demystifying Autoencoders - Centre for Educational Technology, Indian Institute of Technology Kharagpur, 1-2 August 2015.
- Machine Learning for Medical Image Analysis: What, where and how? + Whispers of Speckles Part I: Building Computational Imaging Frameworks for Acoustic and Optical Speckle Imaging and Part II: Enlightenment from Shallow to Complex Reasoning with Deep Learning - Indian Institute of Technology Mandi, 24-25 June 2015.
- Decision Trees and Random Forests - Indian Institute of Technology Kharagpur, 1 March 2015.
- Hierarchical Learning of Tissue Energy Interaction Statistical Physics in Acoustic and Optical Imaging for Computational In situ Histopathology - Indian Institute of Science Bangalore, 14 December 2014.
- Machine Learning of Tissue-Energy Interaction Physics for Computational Histology - Indian Institute of Technology Kharagpur, 31 October 2014.
- Deep Learning - What's the buzz all about? - Indian Institute of Technology Kharagpur, 5 August 2014.

Supervised Students' Paper and Thesis Awards

- Kaustuv Mishra – Keshab K. Parhi Best M. Tech Thesis Award (2017) IIT Kharagpur
- Arna Ghosh – Institute Silver Medal (2017), Systems Society Best B. Tech Thesis Award (2017) IIT Kharagpur
- Rahul Singh – Best B. Tech Thesis Award in Electrical Engineering (2017) IIT Kharagpur
- Abhijit Guha Roy – Intel India PhD Fellowship (2016-19), Institute Silver Medal (2015) IIT Kharagpur, DAAD Fellowship (2014, 2016-17).
- Niladri Garai – Shastri Indo-Canadian Institute Visitation Fellowship for PhD (2016)
- Sailesh Conjeti - Institute Silver Medal (2014) IIT Kharagpur, DAAD Fellowship (2013).
- Biswajoy Ghosh - DAAD Fellowship (2013).

List of Publications

Journal

[1] Guha Roy A, Conjeti S, Karri SPK, **Sheet D**, Katouzian A, Wachinger C, Navab N, “ReLayNet: retinal layer and fluid segmentation of macular optical coherence tomography using fully convolutional networks”, *Biomedical Optics Express*, vol. 8, no. 8., pp. 3627-3642, 2017.

[2] Conjeti S, Katouzian A, Guha Roy A, Peter L, **Sheet D**, Carlier S, Laine A, Navab N, “Supervised domain adaptation of decision forests: Transfer of models trained in vitro for in vivo intravascular ultrasound tissue characterization”, *Medical Image Analysis*, vol. 32, no. 1, pp. 1-17, 2016.

[3] Banerjee S, Chatterjee S, Anura A, Chakrabarty J, Pal M, Ghosh B, Paul RR, **Sheet D**, Chatterjee J, “Global Spectral and Local Molecular Connects for Optical Coherence Tomography Features to Classify Oral Lesions towards Unravelling Quantitative Imaging Biomarkers”, *RSC Advances*, vol. 6, no. 9, pp. 7511-7520, 2016.

[4] Basak K, Dey G, Mahadevappa M, Mandal M, **Sheet D**, Dutta PK, “Learning of speckle statistics for in vivo and noninvasive characterization of cutaneous wound regions using laser speckle contrast imaging”, *Microvascular Research*, vol. 107, pp. 6 – 16, 2016.

[5] Guha Roy A, Conjeti S, Carlier S, Dutta PK, Kastrati A, Laine AF, Navab N, Katouzian A, **Sheet D**, "Lumen Segmentation in Intravascular Optical Coherence Tomography using Backscattering Tracked and Initialized Random Walks", *IEEE Journal of Biomedical and Health Informatics*, vol. 20, no. 2, pp. 606 - 614, 2016.

[6] Chaudhary A, Bag S, Mandal M, Karri SPK, Barui A, Rajput M, Banerjee P, **Sheet D**, Chatterjee J, "Modulating prime molecular expressions and in vitro wound healing rate in keratinocyte (HaCaT) population under characteristic honey dilutions", *Journal of Ethnopharmacology*, vol. 166, pp. 211-219 2015.

[7] **Sheet D**, Karamalis A, Eslami A, Noel PB, Chatterjee J, Ray AK, Laine AF, Carlier SG, Navab N, Katouzian A, “Joint learning of ultrasonic backscattering statistical physics and signal confidence primal for characterizing atherosclerotic plaques using intravascular ultrasound”, *Medical Image Analysis*, vol. 18, no. 1, pp. 103-117, 2014.

[8] **Sheet D**, Karamalis A, Eslami A, Noel PB, Virmani R, Nakano M, Chatterjee J, Ray AK, Laine AF, Carlier SG, Navab N, Katouzian A, “Hunting for necrosis in the shadows of intravascular ultrasound”, *Computerized Medical Imaging and Graphics*, vol. 38, no. 2, pp. 104-112, 2014.

[9] **Sheet D**, Chaudhary A, Karri SPK, Das D, Katouzian A, Banerjee P, Navab N, Chatterjee J, Ray AK, “*In situ* histology of mice skin through transfer learning of tissue energy interaction in optical coherence tomography”, *J. Biomed. Optics*, vol. 18, no. 9, pp. 090503-1-3, 2013.

[10] Katouzian A, Karamalis A, **Sheet D**, Konofagou E, Baseri B, Carlier SG, Eslami A, Koenig A, Navab N, Laine AF, “Iterative self-organizing atherosclerotic tissue labeling in intravascular ultrasound images and comparison with virtual histology”, *IEEE Trans. Biomed. Engg.*, vol. 59, no. 11, pp. 3039-3049, 2012.

[11] Garud HT, **Sheet D**, Mahadevappa M, Chatterjee J, Ray AK and Ghosh A, “Breast fine needle aspiration cytology practices and commonly perceived diagnostic significance of cytological features: a pan-India survey”, *J. Cytology*, vol. 29, no. 3, pp. 183-189, 2012.

[12] Thakur G, Mitra A, Basak A, **Sheet D**, “Characterization and scanning electron microscopic investigation of cross linked freeze dried gelatin matrices for study of drug diffusivity and release kinetics”, *Micron*, vol. 43, no. 2, pp. 311-320, 2012.

[13] **Sheet D**, Chatterjee J and Garud H, “Feature usability index and optimal feature subset selection”, *Int. J. Comp. Appl.*, vol. 12, no. 2, pp. 29-32, 2010.

[14] **Sheet D**, Garud H, Suveer A, Chatterjee J and Mahadevappa M, “Brightness preserving dynamic fuzzy histogram equalization”, *IEEE Trans., Consumer Electronics*, vol. 56, no. 4, pp. 2475 – 2480, 2010.

Patents

[1] Method and apparatus for enhancing representations of micro-calcifications in a digital mammogram image (2012), Garud H, **Sheet D**, Suveer A, Mahadevappa M, Ray AK, *US Patent*, Pub. no. US2012/0087565 A1, Pub. on 12 Apr. 2012.
[2] Method and system for determining skinline in digital mammogram images (2011), Garud H, Ray AK, Kargallu AG, **Sheet D**, *US Patent*, Pub. no. US 2011/0200238 A1, Pub. on 18 Aug. 2011.
[3] Digital microscopy equipment with image acquisition, image analysis and network communication (2011), Garud H, **Sheet D**, Chatterjee J, Mahadevappa M, Ray AK, *US Patent*, Pub. no. US 2011/0122242 A1, Pub. on 26 May 2011.
[4] Method and system for analyzing breast carcinoma using microscopic image analysis of fine needle aspirates (2010), Garud H, Mitra B, **Sheet D**, Maity PP, Ray AK, Chatterjee J, Chakraborty C, Ghosh A, Banerjee P, *US Patent*, Pub. no. US 2010/0111397 A1, Pub. on 6 May 2010.
[5] System and methods for characterizing tissues in intravascular ultrasound using statistical physics (2013), Laine AF, Katouzian A, **Sheet D**, Karamalis A, *US Patent Application* 68,355, Applied on 15 March 2013.
[6] Intelligent implanted health sensing device and assembly (2012), Katouzian A, Navab N, **Sheet D**, Karamalis A, Hennersperger C, *European Patent Application*, (Invention disclosure submitted on 20 July 2012).
[7] Methods and system for characterizing tissues in optical coherence tomography (2013), **Sheet D**, Chaudhary A, Chatterjee J, Ray AK, Katouzian A, *Indian Patent Application*, (Invention disclosure submitted on 19 June 2013).
[8] Adaptive weighted local difference order statistics filter (2013), Garud H, **Sheet D**, Madadevappa M, Chatterjee J, Ray AK, *US Patent,* Pub. No. US2015/0086125 A1, Pub. on 26 Mar. 2015.

Book

[1] **Sheet D**, Chatterjee J and Ray AK, *Feature Usability Index,* Lambert Academic Publishing, Germany, 2011.

Book Chapters

[1] Conjeti S, Guha Roy A, **Sheet D**, Carlier S, Sayeda-Mahmood T, Navab N, Katouzian A, "Domain Adapted Model for In Vivo Intravascular Ultrasound Tissue Characterization", In: Computing and Visualization for Intravascular Imaging and Computer Assisted Stenting, (Balocco S, Zualaga MA, Zahnd G, Lee S, Demirci S Eds.), Academic Press – Elsevier, Ch. 7, 2017.
[2] Garud H, **Sheet D**, Chatterjee J, Mahadevappa M, Ray AK and Ghosh A, "Computer Vision Theoretic Approach for Breast Cancer Diagnosis: Commonly Perceived Diagnostic Significance of Cytological Features and Feature Usability Analysis of an Existing Breast Cancer Database", In: *Multimodality Breast Imaging: Diagnosis and Treatment*, (Ng EYK, Acharya UR, Rangayyan RM, Suri JS, Eds.), SPIE, Ch. 13, March 2013.

Magazine Articles

[1] **Sheet D**, "Toward a Comprehensive Cure: Digital information and communication technology is helping to meet health care challenges in India", *IEEE PULSE*, vol. 7, no. 6, pp. 34-37, 2016.
[2] Tong S, **Sheet D**, Bhuiyan S, Diaz MLZ, Taberne A, "BME Trends Around the World: From Baby X to frugal technologies, here's what biomedical engineers are excited about in 2015. [From the Editors]", *IEEE PULSE*, vol. 6, no. 1, pp. 4-6, 2015.
[3] **Sheet D**, "Electronic Dice using AT89C2051", *Electronics for You*, 105, 2010.

Conference (Archived full papers)

[1] Error Corrective Boosting for Learning Fully Convolutional Networks with Limited Data (2017), Guha Roy A, Conjeti S, **Sheet D**, Katouzian A, Navab N, Wachinger C, *Proc. Med. Image Comput., Comp. Assist. Interv. (MICCAI)*.

[2] Learning Latent Temporal Connectionism of Deep Residual Visual Abstractions for Identifying Surgical Tools in Laparoscopy Procedures (2017), Mishra K, Sathish R, **Sheet D**, *Proc. 30th IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshop on Deep-Vision: Deep Learning in Computer Vision - Temporal Deep Learning*, 58-65.

[3] High-magnification Multi-views Based Classification of Breast Fine Needle Aspiration Cytology Cell Samples using Fusion of Decisions from Deep Convolutional Networks (2017), Garud H, Karri SPK, **Sheet D**, Ghosh A, Maity AK, Mahadevappa M, Chatterjee J, Ray AK, *Proc. 30th IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshop on Computer Vision for Microscopy Image Analysis*, 76-81.

[4] Classifying Histopathology Whole-Slides using Fusion of Decisions from Deep Convolutional Network on a Collection of Random Multi-views at Multi-magnifications (2017), Das K, Karri SPK, Guha Roy A, Chatterjee J, **Sheet D**, *Proc. IEEE Int. Symp. on Biomedical Imaging (ISBI)*, 1024-1027.

[5] Immersive augmented reality system for assisting needle positioning during ultrasound guided intervention (2016), Kanithi PK, Chatterjee J, **Sheet D**, *Proc. 10th Indian Conf. Comp. Vis., Graph., Image Process (ICVGIP)*, 65-1-6.

[6] Limitations with measuring performance of techniques for abnormality localization in surveillance video and how to overcome them? (2016), Sharma MK, Sarkar S, **Sheet D**, Biswas PK, *Proc. 10th Indian Conf. Comp. Vis., Graph., Image Process (ICVGIP)*, 75-1-6.

[7] Segmenting of Lumen and External Elastic Laminae in Intravascular Ultrasound Images using Ultrasonic Backscattering Physics Initialized Multiscale Random Walks (2016), China D, Mitra P, **Sheet D**, *Proc. MedImage Workshop - 10th Indian Conf. Comp. Vis., Graph., Image Process (ICVGIP)*.

[8] Methods and System for Segmented of Isolated Nuclei in Microscopic Images of Breast Fine Needle Aspiration Cytology Images (2016), Garud HT, Karri SPK, Ghosh A, **Sheet D**, Chatterjee J, Mahadevappa M, Ray AK, *Proc. MedImage Workshop - 10th Indian Conf. Comp. Vis., Graph., Image Process (ICVGIP)*.

[9] Tracking of Retinal Microsurgery Tools using Late Fusion of Responses from Convolutional Neural Network over Pyramidally Decomposed Frames (2016), Mishra K, Sathish R, **Sheet D**, *Proc. MedImage Workshop - 10th Indian Conf. Comp. Vis., Graph., Image Process (ICVGIP)*.

[10] Deep neural ensemble for retinal vessel segmentation in fundus images towards achieving label-free angiography (2016), Lahiri A, Guha Roy A, **Sheet D**, Biswas PK, *Proc. 37th Ann. Int. Conf. of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 1340-1343.

[11] Abnormality Detecting Deep Belief Network (2016), Sharma M, **Sheet D** and Biswas PK, *Proc. Int. Conf. Adv., Inf. Comm. Tech., Computing*, 11-1-4.

[12] Multiscale Distribution Preserving Autoencoders for Plaque Detection in Intravascular Optical Coherence Tomography (2016), Guha Roy A, Conjeti S, Carlier SG, Houissa K, König A, Kastrati A, Dutta PK, Laine AF, Navab N, Katouzian A and **Sheet D**, *Proc. Int. Symp. Biomed. Imaging (ISBI)*, 1359-1362.

[13] Landscaping of Random Forests through Controlled Deforestation (2016), Das K, Guha Roy A, Chatterjee J and **Sheet D**, *Proc. 22nd Nat. Conf. Communications (NCC),* 1-5.

[14] DASA: Domain adaptation in stacked autoencoders using systematic dropout (2015), Guha Roy A and **Sheet D**, *Proc. 3rd Asian Conf. Pattern Recognition (ACPR)*, 735-739.

[15] Deep Neural Network and Random Forest Hybrid Architecture for Learning to Detect Retinal Vessels in Fundus Images (2015), Maji D, Santara A, Ghosh S, **Sheet D**, Mitra P, *Proc. 37th Ann. Int. Conf. of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 3029 - 3032.

[16] Probabilistic Graphical Modeling of Speckle Statistics in Laser Speckle Contrast Imaging for Noninvasive and Label-Free Retinal Angiography (2015), Basak K, Dey G, **Sheet D**, Mahadevappa

M, Mandal M, Dutta PK, *Proc. 37th Ann. Int. Conf. of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 6244 - 6247.

[17] Deep Learning of Tissue Specific Speckle Representations in Optical Coherence Tomography and Deeper Exploration for in situ Histology (2015), **Sheet D**, Karri SPK, Katouzian A, Navab N, Ray AK, Chatterjee J, *Proc. Int. Symp. Biomed. Imaging (ISBI)*, 777 - 780.

[18] Bag of Forests for Modelling of Tissue Energy Interaction in Optical Coherence Tomography for Atherosclerotic Plaque Susceptibility Assessment (2015), Guha Roy A, Conjeti S, Carlier SG, König A, Kastrati A, Dutta PK, Laine AF, Navab N, **Sheet D**, Katouzian A, *Proc. Int. Symp. Biomed. Imaging (ISBI)*, 428 - 431.

[19] Deformable Registration of Immunofluorescence and Histology Using Iterative Cross-Modal Propagation (2015), Conjeti S, Yigitsoy M, Peng T, **Sheet D**, Chatterjee J, Bayer C, Navab N, Katouzian A, *Proc. Int. Symp. Biomed. Imaging (ISBI)*, 310 - 313.

[20] Mutually Coherent Structural Representation for Image Registration through Joint Manifold Embedding and Alignment (2015), Conjeti S, Yigitsoy M, **Sheet D**, Chatterjee J, Navab N, Katouzian A, *Proc. Int. Symp. Biomed. Imaging (ISBI)*, 601 - 604.

[21] Learning Scale-space Representation of Nucleus for Accurate Localization and Segmentation of Epithelial Squamous Nuclei in Cervical Smears (2014), Karri SPK, Garud H, **Sheet D**, Ray AK, Chatterjee J, Mahadevappa M, *Proc. Int. Conf. Biomed., Health Informatics (BHI)*, 772-775.

[22] Transfer Learning of Tissue Photon Interaction in Optical Coherence Tomography towards In vivo Histology of the Oral Mucosa (2014), **Sheet D**, Banerjee S, Karri SPK, Bag S, Anura A, Giri A, Paul RR, Pal M, Sarkar BC, Ghosh R, Katouzian A, Navab N, Ray AK, *Proc. Int. Symp. Biomed. Imaging (ISBI).*

[23] A Generalized Framework for Stain Separation in Digital Pathology Applications (2014), Ghosh B, Conjeti S, Karri SPK, **Sheet D**, Garud H, Ghosh A, Chatterjee J and Ray AK, *Proc. SPIE Medical Imaging: Digital Pathology.*

[24] Enhancing effective depth-of-field using spectra-specific wavelets based multi-focus image fusion for digital pathology applications (2014), Conjeti S, Ghosh B, Karri SPK, **Sheet D**, Garud H, Chatterjee J and Ray AK, *Proc. SPIE Medical Imaging: Digital Pathology.*

[25] Detection of retinal vessels in fundus images through transfer learning of tissue specific photon interaction statistical physics (2013), **Sheet D**, Karri SPK, Conjeti S, Ghosh S, Chatterjee J and Ray AK, *Proc. Int. Symp. Biomedical Imaging (ISBI)*.

[26] Random forest learning of ultrasonic statistical physics and object spaces for lesion detection in 2D sonomammography (2013), **Sheet D**, Karamalis A, Kraft S, Noel PB, Vag T, Sadhu A, Katouzian A, Navab N, Chatterjee J and Ray AK, *Proc. SPIE Medical Imaging: Ultrasonic Imaging, Tomography, and Therapy*, (Bosch JG, Doyley MM, Eds), 8675, 867515-1-8.

[27] Introducing nuclei scatter patterns into histology based intravascular ultrasound simulation framework (2013), Kraft S, Karamalis A, **Sheet D**, Noel PB, Drecoll E, Navab N, Katouzian A, *Proc. SPIE Medical Imaging: Ultrasonic Imaging, Tomography, and Therapy*, (Bosch JG, Doyley MM, Eds), 8675, 86750Y-1-6.

[28] Brightness preserving contrast enhancement in digital pathology (2011), Garud H, **Sheet D**, Suveer A, Karri SPK, Ray AK, Mahadevappa M, Chatterjee J, *Proc. Int. Conf. Image Information Processing*, 1-5.

[29] Volume visualization approach for depth-of-field extension in digital pathology (2011), Garud H, Ray AK, Mandal S, **Sheet D**, Mahadevappa M, Chatterjee J, *Proc. 4th Int. Conf. Image and Signal Processing*, 335-339.

[30] Comparative evaluation of speckle reduction algorithms in optical coherence tomography (2010), Pal S, **Sheet D**, Chakraborty A, Chatterjee J, *IEEE India Ann. Conf.*, 1-4.

[31] Visual importance pooling for image quality assessment of despeckle filters in optical coherence tomography (2010), **Sheet D**, Pal S, Chakraborty A, Chatterjee J, Ray AK, *Int. Conf. Sys. Med. Biol.*, 102-107.

[32] Evaluation of p63 expression in oral sub-mucous fibrosis (2010), Das RK, Venkatraghavan V, **Sheet D**, Chakraborty C, Ray AK, Chatterjee J, Pal M, Paul RR, Int. Conf. Sys. Med. Biol., 166-171.

[33] Image quality assessment for performance evaluation of despeckle filters in optical coherence tomography of human skin (2010), **Sheet D**, Pal S, Chakraborty A, Chatterjee J, Ray AK, *Proc. IEEE EMBS Conf. Biomedical Engineering and Sciences*, 499-504.

[34] Statistical tools for evaluating classification efficacy of feature extraction techniques (2010), **Sheet D**, Venkatraghavan V, Suveer A, Garud H, Chatterjee J, Mahadevappa M, Ray AK, *Proc. 2nd Int. Conf. Digital Image Processing*, SPIE, 7546, 75461B-1-8.

[35] An Electroencephalogram Signal based Triggering Circuit for controlling Hand Grasp in Neuroprosthetics (2009), Karthikeyan G, **Sheet D**, Manjunatha M, *Proc. 13th Int. Conf. Biomedical Engineering*, 691-693.

[36] Voice Filtering over a Wideband Stereophonic Audio Signal (2008), **Sheet D**, *Proc. Nat. Conf. VLSI and Comm.*, 24-28.

[37] RFID based Airport Logistics Management (2008), Datta T, **Sheet D**, Si AK, Biswas SD, Ghosh D, *Proc. 3rd Inn. Conf. on Embedded Systems, Mobile Communication & Computing*, 228-232.

[38] Realization and simulation of the hardware for RFID system and its performance study (2007), **Sheet D**, Kumar A, Dutta A, Dasgupta S, Datta T, Sarkar SK, *Proc. Int. Conf. Information and Communication Technology in Electrical Sciences*, 697-700.

Conference Abstracts:

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