

# Jeny Rajan

## Curriculum Vitae

### Address

Department of Computer Science and Engineering  
National Institute of Technology – Karnataka  
Surathkal, Mangalore  
India – 575 025

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### Research Interests

Medical Imaging, Satellite Image Processing, Data Structures

### Education

#### Ph.D (in Computer Science)

Topic : Estimation and removal of noise from single and multiple coil MRI 2009- 2012  
Supervisor: **Prof. Dr. Jan Sijbers**  
Vision Lab, University of Antwerp, Belgium

#### M.Tech. Computer Science (*Specialization in Image Processing*)

Department of Computer Science  
University of Kerala, India  
CGPA: 3.16/4 (*first class with distinction*) 2003-2005

### Awards and Honors

- **PhD Research Fellowship**, University of Antwerp, Belgium, 2009.
- **Technology Breakthrough Award 2007**, from NeST, Technopark, Trivandrum, India (for the development of BrainAssist – a State-of-the-art tool for Brain Tumor Analysis)
- **Innovative Student Projects Award 2006**. (Best Thesis Award, M.Tech. Level) from the Indian National Academy of Engineering (INAE), New Delhi, India.
- Matlab Central, File exchange **pick of the week**, 2012.
- **GATE fellowship (2003)** for M.Tech. from All India Council for Technical Education (AICTE), New Delhi.

### Research and Teaching Experience

#### Assistant Professor

Dept. of Computer Science and Engineering  
National Institute of Technology-Karnataka  
Surathkal, India.

February 2013 – Till date

**Postdoctoral Researcher**  
Vision Lab, University of Antwerp, Belgium

November 2012 – February, 2013

**PhD Research Student**  
Vision Lab, University of Antwerp, Belgium

April 2009 - October 2012

**Senior Specialist**  
Medical Imaging Research Group,  
Healthcare Division, NeST,  
Technopark, Trivandrum.  
(was working in collaboration with the Sree Chitra Thirunal Institute of Medical Sciences and Technology,  
Trivandrum, India)

April 2005- March 2009

## Publications

### in peer reviewed international journals

1. P.V Sudeep, P Palanisamy, **Jeny Rajan**, Hediye Baradaran, Luca Saba, Ajay Gupta, Jasjit S Suri, "Speckle Reduction in Medical Ultrasound Images using an Unbiased Non-Local Means Method", Biomedical Signal Processing and Control, Vol 28, pp: 1-8, 2016.
2. Tadashi Araki, Asheed Kumar, Krishna Kumar P, Nobutaka Ikeda, Ajay Gupta, Luca Saba, **Jeny Rajan**, Francesco Lavra, Aditya M Sharma, Shoaib Shafique, Andrew Nicolaides, John R. Laird, , Jasjit S. Suri, "Ultrasound-Based Automated Carotid Lumen Diameter/Stenosis Measurement and its Validation System", Journal of Vascular Ultrasound (Accepted), 2016.
3. P.V. Sudeep, S. Issac Niwas S, P. Palanisamy, **Jeny Rajan**, Yu. Xiaojun, Xianghong Wang, Yuemei Luo, Linbo Liu, Enhancement and Bias Removal of Optical Coherence Tomography Images: an Iterative Approach with Adaptive Bilateral Filtering, Computers in Biology and Medicine, Vol 71, pp 97-107, 2016.
4. Luca Saba, Tadashi Araki, Krishna Kumar, **Jeny Rajan**, Francesco Lavra, Nobutaka Ikeda, Aditya M Sharma, Shoaib Shafique, Andrew Nicolaides, John R Laird, Ajay Gupta, and Jasjit Suri, Carotid Inter-Adventitial Diameter is More Strongly Related to Plaque Score Than Lumen Diameter: An Automated Tool for Stroke Analysis, Journal of Clinical Ultrasound, 2016 (In Press).
5. Adithya Upadhyaa,, Basavaraj Talawar, **Jeny Rajan**, "GPU implementation of Non Local Maximum Likelihood method for MRI denoising" Journal of Real Time Image Processing. (in Press), 2016.
6. Rani Oomman Panicker, Biju Soman, Gagan Saini, **Jeny Rajan**, "A review of automatic methods based on image processing techniques for tuberculosis detection from microscopic sputum smear images", Journal of Medical Systems, Vol. 40,pp 1 - 13, 2016.
7. Aditya M.Sharma, Ajay Gupta, Krishna Kumar P, **Jeny Rajan**, Luca Saba, Ikeda Nobutaka, John R Laird, Andrew Nicolades, Jasjit S. Suri, "A Review on Carotid Ultrasound Atherosclerotic Tissue Characterization and Stroke Risk Stratification in Machine Learning Framework", Current Atherosclerosis Reports (Springer), Vol 17, pp 1: 13, 2015.
8. Krishna Kumar P, Darshan P, Sheethal Kumar, Rahul Ravindra, **Jeny Rajan**, Luca Saba, Jasjit S Suri, "Magnetic resonance image denoising using nonlocal maximum likelihood paradigm in DCT-framework", International Journal of Imaging Systems and Technology, Vol 25, pp 256 : 264, 2015.

9. Sudeep P.V, Palanisamy P, Chandrasekharan Kesavadas, **Jeny Rajan**, "Nonlocal Linear Minimum Mean Square Error Methods for Denoising MRI", *Biomedical Signal Processing and Control (Elsevier)* , Vol 20, pp 125-134, 2015.
10. Riji R, **Jeny Rajan**, Jan Sijbers, Madhu S Nair, " Iterative Bilateral Filter for Rician Noise Reduction in MR Images ", *Signal, Image and Video Processing (in Press)*, 2014
11. **Jeny Rajan**, Arnold J. den Dekker and Jan Sijbers, "A new non-local maximum likelihood estimation method for Rician noise reduction in magnetic resonance images using the Kolmogorov-Smirnov test ", *Signal Processing*, Vol 103, pp 16-23, 2014 .
12. Jelle Veraart, **Jeny Rajan**, Ronald R. Peeters, Alexander Leemans, Stefan Sunaert, Jan Sijbers, " Comprehensive framework for accurate diffusion MRI parameter estimation ", *Magnetic Resonance in Medicine*, Vol. 81, issue 4, pp. 972-984, 2013.
13. **Jeny Rajan**, Jelle Veraart, Johan Van Audekerke, Marleen Verhoye and Jan Sijbers, " Nonlocal maximum likelihood estimation method for denoising multiple-coil magnetic resonance images", *Magnetic Resonance Imaging*, Vol 30, pp. 1512-1518, 2012.
14. Mai Zhenhua, **Jeny Rajan**, Marleen Verhoye, Jan Sijbers," Robust edge-directed interpolation of magnetic resonance images". *Physics in Medicine and Biology*, vol. 56, pp. 7287-7303, 2011.
15. **Jeny Rajan**, Ben Jeurissen, Marleen Verhoye, Johan Van Audekerke and Jan Sijbers, " Maximum likelihood estimation based denoising of magnetic resonance images using restricted local neighborhoods", *Physics in Medicine and Biology* Vol 56, pp 5221- 5234,2011.
16. **Jeny Rajan**, Dirk Poot, Jaber Juntu and Jan Sijbers, "Noise Measurement from magnitude MRI using local estimates of variance and skewness", *Physics in Medicine and Biology*, Vol 55, pp N441-N449, 2010.
17. Jaber Juntu, Jan Sijbers, Steve De Baker, **Jeny Rajan**, Dirk Van Dyck, "A Machine Learning Study of Several Classifiers Trained with Texture Analysis Features to Differentiate Benign from Malignant Soft Tissue Tumors in T1-MRI images", *Journal of Magnetic Resonance Imaging (JMRI)*, Vol 31, pp 680-689, 2010.
18. **Jeny Rajan**, K. Kannan, C. Kesavadas, Bejoy Thomas "Focal Cortical Dysplasia (FCD) Lesion Analysis with Complex Diffusion Approach, *Computerized Medical Imaging & Graphics* , Vol 33 pp 553-558, 2009.
19. **Jeny Rajan**, K. Kannan, M.R. Kaimal, "An Improved Hybrid Method for Molecular Image Denoising", *Journal of Mathematical Imaging & Vision*, Vol 31, pp 71-78, May 2008.

#### **in peer reviewed international conferences (Published in proceedings)**

20. Soorajkumar R, Krishnakumar P, Girish D, **Jeny Rajan**, Coupled PDE for ultrasound de-speckling using ENI Classification, *ICISP 2016*, 2016 (Accepted).
21. Soorajkumar R, Krishna Kumar P, Girish D, **Jeny Rajan**, Fourth Order PDE Based Ultrasound Despeckling Using ENI Classification, *SPCOM 2016*, IISc Bangalore, 2016. (Accepted)
22. Narendra Rao T.J, Girish G N and **Jeny Rajan**, An Improved Contextual Information Based Approach for Anomaly Detection via Adaptive Inference for Surveillance, *International Conference on Computer Vision & Image Processing (CVIP 2016)*, IIT Roorke, 2016 (Accepted) (Received Best student paper Award).

23. Aneesh G Nath, Madhu S Nair, **Jeny Rajan**, "Single image super resolution from compressive samples using two level sparsity based reconstruction", *Procedia Computer Science (Elsevier)* Vol. 46, pp 1643-1652, 2015.
24. Sudeep P.V, Palanisamy P, **Jeny Rajan**, "A Hybrid model for Rician noise reduction in MRI", 2013 Second International Conference on Advanced Computing, Networking and Security (ADCONS 2013, IEEE), pp 58-61, 2013.
25. **Jeny Rajan**, Arnold J. den Dekker, Jaber Juntu and Jan Sijbers, "A new non local maximum likelihood estimation method for denoising Magnetic Resonance images", In: P. Maji et al. (Eds.): *PRReMI 2013 (ISI Calcutta)*, LNCS 8251, pp. 451–458, 2013, Springer, Heidelberg (2013)
26. **Jeny Rajan**, Johan Van Audekerke, Annemie Van der Linden, Marleen Verhoye and Jan Sijbers, " An adaptive non local maximum likelihood estimation method for denoising magnetic resonance images", *IEEE International Symposium on Biomedical Imaging (ISBI 2012)*, pp 1136-1139, 2012.
27. **Jeny Rajan**, Jan Sijbers, "A Maximum Likelihood Estimation Method for Denoising Magnitude MRI using Restricted Local Neighborhood", in *Proceedings of SPIE Medical Imaging 2011*, Vol. 7962,79624U, 2011.
28. **Jeny Rajan**, Jan Sijbers, Dirk Poot, Jaber Juntu, "Segmentation based Noise Variance Estimation from background MRI data", in *Proceedings of ICIAR 2010*, (LNCS Vol. 6111), pp 62-70, 2010.
29. **Jeny Rajan**, Ben Jeurissen, Jan Sijbers, Kannan, "Denoising Magnetic Resonance Images using 4<sup>th</sup> Order Complex Diffusion", in *Proceedings of 13th International Machine Vision and Image Processing Conference (IEEE)*, pp 123-127, 2009.
30. **Jeny Rajan**, K.Kannan, M.R. Kaimal, "Smoothing and Sharpening Effects of Theta in Complex Diffusion for Image Processing", in *Proceedings of Seventh International Conference on Advances in Pattern Recognition (IEEE)*, pp 325-328, February 2009.
31. **Jeny Rajan**, M.R. Kaimal, "Speckle reduction in Images with WEAD & WECD", in *Proceedings of ICVGIP 2006*, *Lecturer Notes in Computer Science (LNCS)*, Springer – Verlag, Vol: 4338, pp 184-193, December 2006.
32. **Jeny Rajan**, M.R.Kaimal, "Image Denoising using Wavelet Embedded Anisotropic Diffusion (WEAD)", in *Proceedings of the IET International Conference on Visual Information Engineering 2006*, pp 589-593, September 2006.

#### **in national conferences**

33. **Jeny Rajan**, K. Kannan, Thomas Francis, C. Kesavadas, Chandrasekhar P.S, M.R Brain Volume Analysis using BrainAssist, *Proceedings of International Conference on Systemics Cybernetics & Informatics*, January 2008.
34. K. Kannan, **Jeny Rajan**, "A Novel Method for Automatic Heart Localization from Thoracic SPECT Planar Images", *Proceedings of National Conference on Computer Vision, Pattern Recognition, Image Processing & Graphics (NCVPRIPG08)*, pp : 145-148, January 2008
35. **Jeny Rajan**, K. Kannan, Thomas Francis, C. Kesavadas, Chandrasekhar P.S, M.R Brain Volume Analysis using BrainAssist, *Proceedings of International Conference on Systemics, Cybernetics & Informatics*, January 2008.

## Abstracts

36. A.M Sharma, T Araki, A. M. Kumar, N Ikeda, F Lavra, **J Rajan**, L Saba, A Nicolaides, J R Laird, S Shafique, J S Suri, "Automated carotid artery lumen measurement utilizing ultrasound", Society for Vascular Medicine (SVM), 26th Annual Scientific Sessions, Maryland, USA, 2015.
37. J. Veraart, **J. Rajan**, R. R. Peeters, A. Leemans, S. Sunaert, J. Sijbers, Diffusion MRI: Estimation of spatially variable Rician noise, ESMRMB 2012,pp :266, 2012.
38. **Jeny Rajan**, Johan Van Audekerke, Jelle Veraart , Marleen Verhoye, Jan Sijbers, "An extended NLML method for denoising non-central chi distributed data - application to parallel MRI", Fourth annual meeting of Benelux ISMRM chapter, pp 41, 2012
39. **Jeny Rajan**, Jan Sijbers, "Denoising SENSE reconstructed MR images", 5th Annual Symposium of the Benelux Chapter of the IEEE Engineering in Medicine and Biology Society (EMBS), 2011.
40. Mai Zhenhua, **Jeny Rajan**, Marleen Verhoye, Jan Sijbers, "Robust edge directed interpolation of diffusion weighted MR images", 28th Annual Scientific Meeting, European Society for Magnetic Resonance in Medicine and Biology (ESMRMB 2011),pp :382, 2011
41. **Jeny Rajan**, Johan Van Audekerke, Marleen Verhoye, Annemie Van der Linden and Jan Sijbers, "Denoising magnitude MRI using an adaptive NLML method", 28th Annual Scientific Meeting, European Society for Magnetic Resonance in Medicine and Biology (ESMRMB 2011), pp: 383, 2011.
42. Maryna Kudiznova, **Jeny Rajan**, Jan Sijbers, " Denoising of DKI images: effect on feasibility and accuracy of kurtosis parameters", 28th Annual Scientific Meeting, European Society for Magnetic Resonance in Medicine and Biology(ESMRMB 2011), Vol 3, pp :236, 2011.
43. **Jeny Rajan**, K. Kannan, C. Kesavadas, Complex diffusion based approach for Focal Cortical Dysplasia (FCD) lesion detection from MR brain images , 20<sup>th</sup> Kerala Science Congress, Jan 2008
44. **Jeny Rajan**, K. Kannan, C. Kesavadas, Thomas Francis, Chandrasekhar P.S, "FCD Lesion Analysis with BrainAssist" 16<sup>th</sup> Asian Conference of Radiological Technologists, November 2007.
45. **Jeny Rajan**, K. Kannan, C. Kesavadas, Bijoy Thomas, Arun Kumar Gupta "A Partial Differential Equation based Approach for Focal Cortical Dysplasia (FCD) lesion detection", 16<sup>th</sup> Asian Conference of Radiological Technologists, November 2007.
46. **Jeny Rajan**, Roopak Sudhakar, M.R. Kaimal, "A Novel Method for Embedding Fingerprint in Face Images", Proceedings 19<sup>th</sup> Kerala Science Congress (Abstracts), pp 853-854, January 2007.

## Copyrighted Softwares

1. **Jeny Rajan**, K. Kannan, Thomas Francis, "**BrainAssist**", Copyright 2007, Network Systems & Technologies (P) Ltd (NeST), Technopark, Trivandrum, India.
2. **Jeny Rajan**, K. Kannan, "**iMAS**", Copyright 2008 Network Systems & Technologies (P) Ltd (NeST), Technopark, Trivandrum, India.

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