

# Roopak R. Tamboli

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PRESONAL INFORMATION	Gender: Male Languages: English, Hindi, Marathi	Date of Birth: 04/09/1988 Marital status: Married
RESEARCH INTERESTS	Image processing, Immersive visualization, Light field, Perceptual quality assessment, 3D reconstruction from multiple views, Camera calibration	
EDUCATION	<b>Indian Institute of Technology Hyderabad</b> Ph.D., Department of Electrical Engineering, CGPA: 9.50 01/2013 - 12/2020 <sup>1</sup> Advisor: Dr. Soumya Jana, Co-advisor: Dr. Sumohana Channappayya Thesis: <i>Multiview 3D Content: Acquisition, Reconstruction, Immersive Visualization and Quality Assessment</i>  M. Tech., Department of Electrical Engineering, CGPA: 9.22 06/2011 - 06/2015 Advisor: Dr. Soumya Jana Thesis: <i>Minimal Representation of Electrocardiogram Signals: Towards Low-Cost Telecardiology</i>  <b>Walchand College of Engineering Sangli</b> B.E., Department of Electronics Engineering 06/2006 - 06/2010	
EXPERIENCE	<b>Postdoctoral Researcher,</b> 03/2021 - 12/2021 <b>Saarland University, Saarbrücken, Germany</b> 5D light-field analysis.  <b>Early Stage Researcher,</b> 01/2018 - 12/2018 <b>Holografika Ltd., Budapest, Hungary</b>  Perceptual quality assessment (subjective and objective) on projection-based light-field displays, orientation preferences of 3D objects via user-interaction, viewing conditions of light-field video content, key performance indicators of light field visualization, light field compression. This position was funded from the European Union's Horizon 2020 research and innovation program under the Marie Skłodowska-Curie grant agreement No. 643072, Network QoE-Net.  <b>Intern,</b> 02/2014 - 03/2014 <b>Yokohama Research Laboratory Hitachi Ltd., Kanagawa, Japan</b>  This internship involved a pilot study on Compressive Sensing (CS) for Magnetic Resonance (MR) Imaging. Several existing sampling schemes and CS reconstruction algorithms were tested on real MR images. This internship was realized under the "Project for Future Researchers at Indian Institute of Technology, Hyderabad (IIT-H) to Enhance Network Development with Scholarship of Japan"	

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<sup>1</sup>Thesis defended on 22.12.2020.

RESEARCH OVERVIEW	<b>Doctoral</b> <ul style="list-style-type: none"> <li>– Multiview content generation using various real and synthetic camera arrangements.</li> <li>– Camera auto-calibration, Euclidean 3D reconstruction from multiple 2D views.</li> <li>– 3D reconstruction of oculofacial region and surface reconstruction.</li> <li>– Subjective and objective methods to assess quality of perceptual experience on projection-based light-field displays.</li> </ul> <b>Masters</b> <ul style="list-style-type: none"> <li>– Non-uniform sampling and sparse recovery of ECG signals.</li> <li>– Low-complexity compact representation of ECG signals.</li> </ul> <b>Publications</b> <ul style="list-style-type: none"> <li>– Journal articles: 3, Conference papers: 21, h-index: 6, i-10 index: 2, Citations: 119.</li> <li>– Google Scholar: <a href="https://goo.gl/L5bPmc">https://goo.gl/L5bPmc</a></li> </ul>	
TEACHING ASSISTANCE	Immersive Multimedia and Telepresence	01/2013 - 05/2013, 08/2014 - 12/2014
	Information Theory and Coding	01/2013 - 05/2013
	Electric and Magnetic Circuits	08/2011 - 12/2011
SERVICE	<b>Reviewer</b> <ul style="list-style-type: none"> <li>– Signal Processing: Image Communication (2019-20), IEEE Transactions on Circuits and System for Video Technology (2019), National Conference on Communications (2018), Biomedical Signal Processing and Control (2016-17).</li> </ul> <b>Contribution to the development of standards</b> <ul style="list-style-type: none"> <li>– IEEE P3333.1.4 - <i>Standard</i> for the Quality Assessment of Light Field Imaging 06/2020 - –</li> </ul>	
ACADEMIC ACHIEVEMENTS	Excellence in Research certificate, 2017, 2018 and 2019, IIT Hyderabad. All India Rank 727/1,37,853 in Graduate Aptitude Test in Engineering (GATE), 2011.	
TECHNICAL SKILLS	Programming: MATLAB, Shell Script    Software and tools: 3DS-MAX, Meshlab, Git Operating systems: MS-Windows, Linux (Ubuntu)	
EXTRA-CURRICULAR ACTIVITIES	Rotaract Club of WCE Sangli (Rotary International District 3170) President (07/2009 - 06/2010), Vice-President (07/2008 - 06/2009)	07/2006 - 06/2011
REFERENCES	<div> Prof. Soumya Jana  Dept. of Electrical Engineering  Indian Institute of Technology Hyderabad </div> <div> Prof. C. S. Sastry  Dept. of Mathematics  Indian Institute of Technology Hyderabad </div> <div> Dr. Sumoahana Channappayya  Dept. of Electrical Engineering  Indian Institute of Technology Hyderabad </div> <div> Tibor Balogh  Founder and CEO  Holografika, Budapest, Hungary </div>	

## JOURNAL ARTICLES

3. P. A. Kara, R. R. Tamboli, O. Doronin, A. Cserkaszkzy, A. Barsi, Zs. Nagy, M. G. Martini, A. Simon, “The key performance indicators of projection-based light field visualization”, *Journal of Information Display*, vol. 20, no. 2, pp. 81–93, 2019.
2. A. Cserkaszkzy, P. A. Kara, R. R. Tamboli, A. Barsi, M. G. Martini, L. Bokor, T. Balogh, “Angularly-continuous light-field format: concept, implementation and evaluation”, *Journal of the Society for the Information Display*, vol. 27, no. 7, pp. 442–461, 2019.
1. R. R. Tamboli<sup>\*</sup>, B. Appina<sup>\*</sup>, S. S. Channappayya, S. Jana, “Super-multiview content with high angular resolution: 3D quality assessment on horizontal-parallax lightfield display”, *Signal Processing: Image Communication*, vol. 47, pp. 42–55, 2016.  
(\*equal contribution)

## CONFERENCE PUBLICATIONS

25. K. Chelli, R. R. Tamboli, T. Herfet, “Deep Learning-based Semantic Analysis of Sparse Light Field Ray Sets”, Accepted in 23rd International Workshop on Multimedia Signal Processing, 2021.
24. P. A. Kara, A. Barsi, R. R. Tamboli, M. Guindy, M. G. Martini, T. Balogh, A. Simon. “Recommendations on the viewing distance of light field displays”, *Digital Optical Technologies*, vol. 11788, International Society for Optics and Photonics, 2021.
23. P. A. Kara, R. R. Tamboli, T. Balogh, B. Appina, A. Simon, “On the use-case-specific quality degradations of light-field visualization”, *SPIE Novel Optical Systems, Methods, and Applications XXIV*, vol. 118150E, 2021.
22. S. Biswas, B. Appina, R. R. Tamboli, P. A. Kara, A. Simon, “On the practical applications of objective quality metrics for stereoscopic 3D imaging”, *SPIE Applications of Machine Learning*, vol. 118430E, 2021.
21. R. R. Tamboli, V. Sandu, S. Nerasala, A. Richhariya, K. K. Vupparaboina, S. Jana, “Novel Hybrid Teleophthalmology: Technological Case for Oculofacial Surgery”, *IEEE Global Humanitarian Technology Conference*, Seattle, pp. 1–8, 2019.
20. P. A. Kara, R. R. Tamboli, A. Cserkaszkzy, A. Barsi, A. Simon, A. Kusz, L. Bokor, M. G. Martini, “Objective and Subjective Assessment of Binocular Disparity for Projection-Based Light Field Displays”, *International Conference on 3D Immersion*, Brussels, pp. 1–8, 2019.
19. P. A. Kara, R. R. Tamboli, A. Cserkaszkzy, A. Barsi, M. G. Martini, Laszlo Bokor, “The viewing conditions of light-field video for subjective quality assessment”, *International Conference on 3D Immersion*, Brussels, pp. 1–8, 2018.
18. R. R. Tamboli<sup>†</sup>, A. Cserkaszkzy, P. A. Kara, A. Barsi, M. G. Martini, “Objective quality evaluation of an angularly continuous light-field format”, *International Conference on 3D Immersion*, Brussels, pp. 1–8, 2018.
17. R. R. Tamboli<sup>†</sup>, P. A. Kara, N. Bisht, A. Barsi, M. G. Martini, S. Jana, “Objective quality assessment of 2D synthesized views for light-field visualization”, *International Conference on 3D Immersion*, Brussels, pp. 1–8, 2018.
16. K. K. Vupparaboina, R. R. Tamboli<sup>†</sup>, M. S. Reddy, P. A. Kara, M. G. Martini, A. Barsi, A. Richhariya, and S. Jana, “Towards true-to-scale 3D reconstruction of the human face using structured light projection and off-the-shelf cameras,” *International Conference on 3D Immersion*, Brussels, pp. 1–8, 2018.

15. A. Cserkaszkzy, P. A. Kara, R. R. Tamboli, A. Barsi, M. G. Martini, T. Balogh, "Light-field capture and display systems: limitations, challenges, and potentials", SPIE Novel Optical Systems Design and Optimization XXI, vol. 10746, San Diego, 2018.
14. P. A. Kara, R. R. Tamboli, A. Cserkaszkzy, M. G. Martini, A. Barsi, L. Bokor, "The perceived quality of light-field video services", SPIE Applications of Digital Image Processing XLI, vol. 10752, San Diego, 2018.
13. R. R. Tamboli, P. A. Kara, A. Cserkaszkzy, A. Barsi, M. G. Martini, S. Jana, "Canonical 3D object orientation for interactive light-field visualization", SPIE Applications of Digital Image Processing XLI, San Diego, vol. 10752, 2018.
12. R. R. Tamboli, K. K. Vupparaboina, M. S. Reddy, P. A. Kara, A. Cserkaszkzy, M. G. Martini, A. Richhariya, S. Jana, "Towards Euclidean auto-calibration of stereo camera arrays", SPIE Optical System Alignment, Tolerancing, and Verification XII, vol. 107470, San Diego, 2018.
11. R. R. Tamboli, P. A. Kara, A. Cserkaszkzy, A. Barsi, M. G. Martini, B. Appina, S. S. Channappayya, S. Jana, "3D objective quality assessment of light field video frames", 3DTV-Conference: The True Vision - Capture, Transmission and Display of 3D Video, Helsinki, pp. 1–4, 2018.
10. R. R. Tamboli<sup>‡</sup>, M. S. Reddy, P. A. Kara, M. G. Martini, S. S. Channappayya, S. Jana, "A high-angular-resolution turntable data-set for experiments on light field visualization quality", Tenth International Conference on Quality of Multimedia Experience, Cagliari, pp. 1–3, 2018.
9. R. R. Tamboli<sup>‡</sup>, P. A. Kara, B. Appina, M. G. Martini, S. S. Channappayya, S. Jana, "Effect of primitive features of content on perceived quality of light field visualization", Tenth International Conference on Quality of Multimedia Experience, Cagliari, pp. 1–3, 2018.
8. R. R. Tamboli<sup>†</sup>, B. Appina, S. S. Channappayya, S. Jana, "Achieving high angular resolution via view synthesis: quality assessment of 3d content on super multiview lightfield display," International Conference on 3D Immersion, Brussels, pp. 1–8, 2017.
7. K. K. Vupparaboina, R. R. Tamboli, M. S. Reddy, A. Richhariya, M. Naik and S. Jana, "Oculofacial surgical planning: True-to-scale 3D feature quantification using multicamera network," IEEE Annual India Conference, Bangalore, pp. 1–6, 2016.
6. R. R. Tamboli and S. Jana, "Telecardiology under resource constraint: Low-complexity compact representation of ECG," Computing in Cardiology Conference 2016, Vancouver, BC, pp. 141–144, 2016.
5. K. K. Vupparaboina, R. R. Tamboli<sup>†</sup>, P. M. Shenu and S. Jana, "Laser-based detection and depth estimation of dry and water-filled potholes: A geometric approach," Twenty First National Conference on Communications, Mumbai, pp. 1–6, 2015.
4. R. R. Tamboli, K. K. Vupparaboina, J. Reddy, S. Jana and S. Channappayya, "A subjective evaluation of true 3D images," International Conference on 3D Imaging, Liege, pp. 1–8, 2014.
3. R. R. Tamboli, M. A. Savkoor, S. Jana and R. Manthalkar, "On the sparsest representation of electrocardiograms," Computing in Cardiology, Zaragoza, pp. 479–482, 2013.
2. R. R. Tamboli<sup>†</sup>, D. S. S. Reddy and S. Jana, "A hybrid Fourier/wavelet technique for improved ECG signal approximation," IEEE International Conference on Signal Processing, Computing and Control, Solan, pp. 1–6, 2013.
1. D. S. S. Reddy, R. R. Tamboli and S. Jana, "Universal nonuniform sampling of ECG signals: Opportunities and obstacles," The 5th Biomedical Engineering International Conference, Ubon Ratchathani, pp. 1–5, 2012.

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<sup>†</sup> Oral presentation.

<sup>‡</sup> Poster presentation.