

Rakesh Malladi

CONTACT INFORMATION	Duncan Hall 2020 ECE Department Rice University	<i>E-mail:</i> Rakesh.Malladi@rice.edu <i>Phone:</i> (540) 845-5915 http://www.ece.rice.edu/~rm17/
RESEARCH INTERESTS	Signal processing, machine learning, computational neuroscience and information theory.	
EDUCATION	Rice University , Houston, Texas, USA Aug. 2011 - Dec. 2016 (expected) <ul style="list-style-type: none">• Ph.D. Candidate in Electrical and Computer Engineering• <i>Advisor:</i> Behnaam Aazhang• <i>Thesis:</i> “Inferring Temporal and Spectral Structure from Data and its Application to Unravel Epileptic Brain Networks”	
	Indian Institute of Technology (IIT) Madras , Chennai, India Aug. 2006 - May 2011 <ul style="list-style-type: none">• Dual Degree (B.Tech & M.Tech) in Electrical Engineering (Communications)• <i>Advisors:</i> David R Koilpillai and Kiran Kuchi• <i>Thesis:</i> “Low-Complexity Iterative Receiver for Frequency-Selective Channels and MIMO Systems”	
PROFESSIONAL EXPERIENCE	Cyberonics , Houston, Texas, USA May 2015 - Aug. 2015 <i>Advisor:</i> Shivkumar Sabesan Developed machine learning algorithms to detect breathing rate from accelerometers in ProGuardian to predict sudden unexpected death in epilepsy (SUDEP).	
	Texas Instruments , Dallas, Texas, USA May 2013 - Aug. 2013 <i>Advisors:</i> Anand G Dabak, Nitish Krishna Murthy Developed a mathematical model of ultrasound guided wave propagation in plates and pipes and used this model to design an algorithm to estimate the thickness of plates.	
	IBM Research Labs , Bangalore, Karnataka, India May 2010 - Jul. 2010 <i>Advisors:</i> Parul Gupta, Shivkumar Kalyanaraman Compared the performance of various cooperative base station communication schemes for time-division and frequency-division duplexing systems.	
PUBLICATIONS (PEER-REVIEWED)	[J1] Rakesh Malladi , Giridhar P Kalamangalam, Nitin Tandon, Behnaam Aazhang, “Identifying seizure onset zone from the causal connectivity inferred using directed information,” in IEEE Journal of Selected Topics in Signal Processing Oct. 2016	
	[C7] Rakesh Malladi , Giridhar P Kalamangalam, Nitin Tandon, Behnaam Aazhang, “Identifying seizure mechanisms from ECoG data using directed information,” Cosyne Abstracts. Feb. 2016	
	[C6] Rakesh Malladi , Giridhar P Kalamangalam, Nitin Tandon, Behnaam Aazhang, “Inferring causal connectivity in epileptogenic zone using directed information,” IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) Apr. 2015	
	[C5] Rakesh Malladi , Giridhar P Kalamangalam, Nitin Tandon, Behnaam Aazhang, “Identifying epileptogenic zone using directed information,” Society for Neuroscience (SfN). One of the 90 dynamic posters selected from about 15000 posters Nov. 2014	
	[C4] Rakesh Malladi , Anand Dabak, Nitish K Murthy, “Modeling ultrasound guided wave propagation for plate thickness measurement,” Proc. SPIE, Nondestructive Characterization for Composite Materials, Aerospace Engineering, Civil Infrastructure, and Homeland Security Mar. 2014	
	[C3] Rakesh Malladi , Behnaam Aazhang, Giridhar P Kalamangalam, “Online bayesian change	

	point detection algorithms for segmentation of epileptic activity,” Proceedings of Asilomar Conference on Signals, Systems, and Computers	Nov. 2013
	[C2] Rakesh Malladi , Kiran Kuchi, R David Koilpillai, “Set-partitioning based forward/backward soft decision algorithms for MIMO detection,” IEEE International Conference on Signal Processing and Communications (SPCOM)	Jul. 2012
	[C1] Mahesh Gupta Vutukuri, Rakesh Malladi , Kiran Kuchi, R David Koilpillai, “SAIC receiver algorithms for VAMOS downlink transmission,” IEEE International Symposium on Wireless Communication Systems (ISWCS)	Nov. 2011
PAPERS UNDER PREPARATION	[J2] Rakesh Malladi , Don Johnson, Giridhar P Kalamangalam, Nitin Tandon, Behnaam Aazhang, “Measuring cross-frequency coupling using mutual information and its application to epilepsy,” to be submitted to IEEE Transactions on Signal Processing.	
	[J3] Rakesh Malladi , Don Johnson, Behnaam Aazhang, “Estimating mutual information over time by aggregating over frequency,” under preparation.	
PATENTS	Rakesh Malladi , Anand G. Dabak, Nitish Krishna Murthy “Structural Health Monitoring (SHM) for Pipes Using Ultrasound Guided Wave Propagation,” US Patent App. 14/458,036	2014
HONORS AND AWARDS	Best graduate student poster award in ECE Affiliates Day, Rice University	2016
	Best graduate student poster award in 21st Annual Neuroscience Poster Session, University of Texas Health Science Center at Houston	2014
	Second place in ECE Affiliates poster competition, Rice University	2014
	IIT Madras Institute Merit Certificate for All India Rank 223 (in top 0.1%)	2006
	Prathibha Award by Government of Andhra Pradesh, India for state 3 rd rank in high school	2004
	National Talent Search Examination (NTSE) Scholarship conferred by National Council of Education Research and Training(NCERT), India	2004
INVITED TALKS	“Inferring Temporal and Spectral Structure from Data and its Application to Unravel Brain Networks,” at IBM Research Watson, Simon Center for Data Analytics and Mitsubishi Electric Research Laboratories	Summer 2016
	“Identifying the epileptogenic zone using directed information,” at Methodist Neurological Institute, Houston	Spring 2015
	“Set-partitioning based forward/backward soft decision algorithms for MIMO detection,” at Indian Institute of Technology Hyderabad	Summer 2011
POSTERS	[7] Rakesh Malladi, Giridhar P Kalamangalam, Nitin Tandon, Behnaam Aazhang, “Identifying seizure mechanisms from ECoG data using directed information,” ECE Affiliates Day, Rice University. Best poster award	Apr. 2016
	[6] Rakesh Malladi, Giridhar P Kalamangalam, Nitin Tandon, Behnaam Aazhang, “Mechanisms of seizure identified from causal connectivity inferred using directed information,” Society for Neuroscience (SfN).	Nov. 2015
	[5] Rakesh Malladi, Giridhar P Kalamangalam, Nitin Tandon, Behnaam Aazhang, “Identifying the epileptogenic zone using directed information,” Annual Neuroscience Poster Session, UT Health Science Center, Houston. Best poster award	Dec. 2014
	[4] Rakesh Malladi, Giridhar P Kalamangalam, Nitin Tandon, Behnaam Aazhang, “Identifying the epileptogenic zone using directed information,” ECE Affiliates Day, Rice University. Second best poster award	Apr. 2014

[3] Rakesh Malladi, Giridhar P Kalamangalam, Nitin Tandon, Behnaam Aazhang, "Are high frequency oscillations biomarkers of epileptogenic zone ? — a network connectivity analysis," Annual Neuroscience Poster Session, UT Health Science Center, Houston. **Dec. 2013**

[2] Rakesh Malladi, Giridhar P Kalamangalam, Nitin Tandon, Behnaam Aazhang, "Time-varying frequency-specific effective connectivity for epilepsy," Center for Neuroengineering Symposium (CNE) Symposium, Rice University. **Oct. 2013**

[1] Rakesh Malladi, Behnaam Aazhang, "Functional connectivity based segmentation of epileptic activity," ECE Affiliates Day, Rice University. **Apr. 2013**

UNDERGRADUATE
MENTORSHIP

Mentored a team of 14 undergraduates over the last two years, who were in a vertically integrated project at Rice University on developing a digital cure for epilepsy. The goal of the project is to develop an implantable device, which will deliver optimal low-frequency electrical stimulation to the seizure onset zone. More details about the project are available at <http://dce.rice.edu>

TEACHING
EXPERIENCE

Teaching assistant for ELEC 242 - Fundamentals of Electrical Engineering II. Taught lectures and tutorial classes (2 hrs/week) every week. **Spring 2014**

Grader for ELEC 430 - Digital Communication, ELEC 533 - Introduction to Random Processes and Applications **2012 - 2013**

SERVICE

Reviewer: International Symposium on Information theory (ISIT), IEEE Transactions on Wireless Communications, Neural Information Processing Systems (NIPS).