BIOGRAPHICAL SKETCH

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NAME: Jambawalikar, Sachin

eRA COMMONS USER NAME (credential, e.g., agency login): sachinj

POSITION TITLE: Chief Medical Physicist

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	END DATE MM/YYYY	FIELD OF STUDY
University of Mumbai, Mumbai, Maharashtra	BENG	05/2000	Biomedical Engineering
Stony Brook university, Stony Brook, New York	MS	05/2001	Biomedical Engineering
Stony Brook University, Stony Brook, New York	PHD	08/2005	Biomedical Engineering
Stony Brook University Medical Center, Stony Brook, New York	Resident	05/2010	CAMPEP Imaging Medical Physics

A. Personal Statement

I am a faculty member in Radiology and Biomedical Engineering and Chief Medical Physicist in Department of Radiology at CUMC/NYP. My background and training have been in MR physics, machine learning and medical image feature analysis for past 13 years since graduation. As an image analysis scientist and MR Safety Expert, I'm interested in developing noninvasive safe MR imaging techniques for disease detection, and evaluation of disease therapy outcomes. My long-term research goals are to evaluate the use of multi-parametric MR feature analysis techniques and develop classification and regression machine learning models for disease and outcome prediction. As a collaborator, I would be involved with MR safety protocol optimization, data acquisition and machine learning algorithm development for the project.

1. Stember JN, Chang P, Stember DM, Liu M, Grinband J, Filippi CG, Meyers P, Jambawalikar S. Convolutional Neural Networks for the Detection and Measurement of Cerebral Aneurysms on Magnetic Resonance Angiography. J Digit Imaging. 2019 Oct;32(5):808-815. PubMed PMID: 30511281; PubMed Central PMCID: PMC6737124.
2. Shukla-Dave A, Obuchowski NA, Chenevert TL, Jambawalikar S, Schwartz LH, Malyarenko D, Huang W, Noworolski SM, Young RJ, Shiroishi MS, Kim H, Coolens C, Laue H, Chung C, Rosen M, Boss M, Jackson EF. Quantitative imaging biomarkers alliance (QIBA) recommendations for improved precision of DWI and DCE-MRI derived biomarkers in multicenter oncology trials. J Magn Reson Imaging. 2019 Jun;49(7):e101-e121. PubMed PMID: 30451345; PubMed Central PMCID: PMC6526078.
3. Ha R, Mutasa S, Karcich J, Gupta N, Pascual Van Sant E, Nemer J, Sun M, Chang P, Liu MZ, Jambawalikar S. Predicting Breast Cancer Molecular Subtype with MRI Dataset Utilizing Convolutional Neural Network Algorithm. J Digit Imaging. 2019 Apr;32(2):276-282. PubMed PMID: 30706213; PubMed Central PMCID: PMC6456631.
4. Ha R, Chang P, Mutasa S, Karcich J, Goodman S, Blum E, Kalinsky K, Liu MZ, Jambawalikar S. Convolutional Neural Network Using a Breast MRI Tumor Dataset Can Predict Oncotype Dx Recurrence Score. J Magn Reson Imaging. 2019 Feb;49(2):518-524. PubMed PMID: 30129697.

B. Positions and Honors

Positions and Employment

2000 - 2005 Research Assistant, MR Research Center, Stony Brook University
2001 - 2002 Research Intern, Viatronix Inc., Stony Brook, NY
2006 - 2008 Post-doctoral Associate (Radiology), Stony Brook University

2008 - 2010	CAMPEP Medical Imaging Resident, Stony Brook University Medical Center
2010 - 2011	Research Scientist (Radiology), Stony Brook University Medical Center
2011 -	Assistant Professor of Radiology (Physics), Columbia University Medical Center, New York, NY
2013 -	MRI Safety officer CUMC/NYP, Columbia University Medical Center
2013 -	Program Director CAMPEP Imaging Residency, Columbia University Medical Center
2014 -	Chief Medical Physicist, Columbia University Medical Center/ NYPH

Other Experience and Professional Memberships

2008 -	Diplomate, ABMP in Magnetic Resonance Imaging, American Board of Medical Physics (ABMP)
2010 -	Full Member, American Association of Physicist in Medicine
2010 -	Magnetic Resonance Examination Panel Committee, American Board of Medical Physics
2010 -	Member and Abstract Reviewer, International Society of Magnetic Resonance in Medicine
2010 -	Diplomate, American Board of Radiology, American Board of Radiology
2011 -	Licensed Diagnostic Medical Physicist, NY State education Department, Office of the Professions
2013 -	Member, Quantitative Imaging Biomarkers Alliance (QIBA) FMRI technical Committee
2014 -	Member, QIBA Perfusion, Diffusion and Flow MRI technical Committee
2019 -	MR Safety Expert (MRSE), Diplomate American Board of MR Safety

Honors

2003	Best Paper Award in the Theory/Graphics session at Stony Brook's Graduate Research Conference, 2003.Hand recognition using Geometric Classifiers, Stony Brook University
2014	Invited to give a talk on MRI safety, 2nd International Workshop on Advances in MRI Technology, Indian Chapter of ISMRM

C. Contribution to Science

1. I am directly involved in the development and evaluation of structural and quantitative MR acquisition methods as well as analysis using deep learning techniques to study disease processes, drug delivery mechanism and biomechanical effects. To that extent I have successfully collaborated with computer scientists, engineers and physicians.
   a) Hecht EM, Liu MZ, Prince MR, Jambawalikar S, Remotti HE, Weisberg SW, Garmon D, Lopez-Pintado S, Woo Y, Kluger MD, Chabot JA. Can diffusion-weighted imaging serve as a biomarker of fibrosis in pancreatic adenocarcinoma? J Magn Reson Imaging. 2017 Aug;46(2):393-402. doi: 10.1002/jmri.25581. Epub 2017 Feb 2. PubMed PMID: 28152252.
   b) Samiotaki G, Karakatsani ME, Buch A, Papadopoulos S, Wu SY, Jambawalikar S, Konofagou EE. Pharmacokinetic analysis and drug delivery efficiency of the focused ultrasound-induced blood-brain barrier opening in non-human primates. Magn Reson Imaging. 2016 Dec 1;37:273-281. PubMed PMID: 27916657.
   c) Jambawalikar S, Baum J, Button T, Li H, Geronimo V, Gould ES. Diffusion tensor imaging of peripheral nerves. Skeletal Radiol. 2010 Nov;39(11):1073-9. PubMed PMID: 20593175.
   d) Fernandez M, House M, Jambawalikar S, Zork N, Vink J, Wapner R, Myers K. Investigating the mechanical function of the cervix during pregnancy using finite element models derived from high-resolution 3D MRI. Comput Methods Biomech Biomed Engin. 2015 May 13; PubMed PMID: 25970655.

2. My lab is involved in the development of deep learning and machine learning algorithms for classification, segmentation and reconstruction of MRI images. I have been actively involved with radiologist at CUMC to apply these techniques to clinical translational and treatment response research.

e) Ha R, Chang P, Karcich J, Mutasa S, Fardanesh R, Wynn RT, Liu MZ, Jambawalikar S. Axillary Lymph Node Evaluation Utilizing Convolutional Neural Networks Using MRI Dataset. J Digit Imaging. 2018 Apr 25. doi: 10.1007/s10278-018-0086-7. PubMed PMID: 29696472

f) Stember JN, Chang P, Stember DM, Liu M, Grinband J, Filippi CG, Meyers P, Jambawalikar S. Convolutional Neural Networks for the Detection and Measurement of Cerebral Aneurysms on Magnetic Resonance Angiography. J Digit Imaging. 2018 Dec 3. doi: 10.1007/s10278-018-0162-z. [Epub ahead of print] PubMed PMID: 30511281.

g) Ha R, Chang P, Mutasa S, Karcich J, Goodman S, Blum E, Kalinsky K, Liu MZ, Jambawalikar S. Convolutional Neural Network Using a Breast MRI Tumor Dataset Can Predict Oncotype Dx Recurrence Score. J Magn Reson Imaging. 2018 Aug 21. doi:10.1002/jmri.26244. [Epub ahead of print] PubMed PMID: 30129697.

h) Ha R, Chang P, Mema E, Mutasa S, Karcich J, Wynn RT, Liu MZ, Jambawalikar S.,Fully Automated Convolutional Neural Network Method for Quantification of Breast MRI Fibroglandular Tissue and Background Parenchymal Enhancement. J Digit Imaging. 2018 Aug 3. doi: 10.1007/s10278-018-0114-7. [Epub ahead of print] PubMed PMID: 30076489.

3. My work during graduate work involved development of tools and software for image segmentation, texture analysis and machine learning based classifiers. I designed a minimum enclosing ball classifiers (MEB) which performed comparable to SVM and neural networks. These tools were applied to dynamic breast MR images for Computer aided diagnosis (CAD) in MR. I am currently working on extending this work to use deep Convolution neural network to perform cancer prediction and treatment response tasks.

a) Jambawalikar S. Application of Texture Analysis to Dynamic Contrast Enhanced Breast Magnetic Resonance Imaging. Dissertation thesis 2005.

b) Bulatov Y, Jambawalikar S, Kumar P, Sethia S. Hand Recognition Using Geometric Classifiers. In Proceedings of International Conference on Biometric Authentication. 2004; :753-759.

c) Jambawalikar, S., Li, H., Shah, S., Fisher, P. and Button, T. (2011), SU-E-I-04: Texture Feature Based CAD for Breast Cancer Detection. Med. Phys., 38: 3396. 2011

d) Jambawalikar S, Kumar P. A note on Approximate Minimum Volume Enclosing Ellipsoid of Ellipsoids. International Conference on Computational Sciences and Its Applications. 2008; :478-487

Complete List of Published Work in My Bibliography:
https://www.ncbi.nlm.nih.gov/myncbi/sachin.jambawalikar.1/bibliography/48626338/public/

D. Additional Information: Research Support and/or Scholastic Performance

ACTIVE

U01 CA211205-01 (Dave, Site: Schwartz) 07/01/2017 – 06/30/2020 1.80 Calendar
NIH $168,150 (sub award project directs)
Quantitative imaging tools to derive DW-MRI oncological biomarkers
The goal of this project is the development of next generation diffusion weighted-MRI (DW-MRI) biomarkers reflective of complex tissue structure and biology, and its alteration due to therapy, as an alternative to traditional apparent diffusion coefficient (ADC).
Role: CO-I

U01 (Garwood, Site: Vaughan/Juchem, C) 09/30/2017 – 6/30/2020 1.20 calendar
National Institute of Health $512,540
Imaging Human Brain Function with Minimal Mobility Restrictions

In this NIH-U01 project, we will build the world's first head-only 1.5 T MRI scanner based on new magnet technology, new RF spectrometer architecture, and a new B_0 gradient concept. Due to its small size, this MRI system will be transportable for imaging brain function and structure in populations and environments almost anywhere. The compactness and efficiency of this new imaging system will furthermore allow the study of the human brain outside the confined MRI bore. Columbia University will have a subcontract (Co-PIs C. Juchem and J.T. Vaughan) for this NIH-U01 grant resident at the University of Minnesota, Center for Magnetic Resonance Research (M. Garwood, PI).
Role: Co-PI (subcontract)

General Electric (Ha) 07/01/2019 – 06/30/2020 1.20 Calendar
Industry-CU Partnership $139,550(project directs)
Convolutional Neural Network Using a Breast MRI Tumor Dataset to Predict Oncotype Dx Recurrence Score
The goal of this project is to further validate and optimize the use of CNN to predict Oncotype DX RS using a larger breast MRI dataset of 500 patients. This will enable a collaboration with a GE specialist to develop a software that can integrates Grantee PI's CNN algorithm for potential commercial use.
Role: CO-I

General Electric (Geethanath) 07/01/2019 – 06/30/2020 0.24 Calendar
Industry-CU Partnership $178,649(project directs)
Tailored Magnetic Resonance Fingerprinting for Pediatric Neuroimaging: An intelligent, flexible, comprehensive framework for rapid prototyping
The goal of this project is to optimize data quality, cost/scanner time and access through the development of a novel tailored magnetic resonance fingerprinting (MRF) pulse sequence and deep learning based reconstruction for pediatric brain imaging. This would be developed to serve patients suffering from epilepsy and cancer. We also hypothesize that this novel method follows naturally in its formulation due to the requirement of such methods by the pediatric population and the nature of the technology. This delivers multiple quantitative parametric maps simultaneously.
Role: CO-PI/MENTOR

5R01NS055903-10 (Nopoulos) 09/01/2019 – 08/31/2024 1.20 Calendar
NIH/NINDS $2,824,214 (project directs)
Growth and development of Striatal-Cerebellum circuitry in subjects at risk for Huntington's Disease
The goal of this project is to evaluate brain structure and function in subjects (age 6-30) at risk for HD.
Role: MRI-EXPERT/CO-I

PENDING

R01 (Bagci) 0.6 calendar

National Institute of Health

Title: Cyst-X

Role: Co-Investigator

Completed Research Support

RSNARR1466 (Soun & Jambawalikar) 07/01/2014 – 06/30/2017 0.60 Calendar
RSNA $30,000
Quantitative T1 Rho Mapping in Multiple Sclerosis: Development of a Potential Novel Biomarker for Disease Prognostication and Management
The goal of this project is to evaluate if T1rho can better inform diagnosis and management of MS patients by providing a quantitative measure of underlying pathology.
Role: CO-I

AVON BREAST CANCER (Ha) 07/01/2014 – 06/30/2017 1.20 Calendar
AVON Foundation $30,000 (Zero Salary)
Deep learning through convolution neural networks using breast MRI tumor dataset to predict Oncotype Dx Recurrence Score
The goal of this project is to further validate our deep learning algorithms for prediction of Oncotype Dx recurrence score from breast MR data.
Role: CO-I

UL1 TR000040, Irving Institute Pilot Award
Tony Wang MD (PI)
07/01/15-06/30/16
Highly Diffusion-Weighted Imaging: A Predictive Marker in Glioblastoma
The overarching goal of this project is to develop a non-invasive radiographic measure to predict and monitor responses to standard interventions for glioblastoma. Prior work has identified DWI as a candidate measure and we hypothesize that HDWI may improve upon earlier results, reducing discordance with standard radiographic assessment and/or improving predictive value.
Role: Co-Investigator

1U54CA168512-02/11-3160, NIH/NCI
Pollock (PI)
09/01/13-08/31/15
SPORE in Sarcomas, Development of Quantitative Imaging Biomarkers for Assessing Response to Sarcoma Therapy
The major goals are to develop imaging biomarkers of apoptosis, angiogenesis, and hypoxia that will predict therapeutic efficacy in Sarcoma, with the hypothesis that functional and molecular imaging of tumor characteristics, particularly apoptosis, angiogenesis, and hypoxia will enable early identification of therapeutic efficacy, particularly of molecular agents that specially target these processes
Role: Co-Investigator

UL1 TR000040, Irving Institute Imaging Pilot award
Timothy Ryntz, MD (PI)
05/01/14-04/30/15
Can Dynamic MRI offer insight into underlying Pathophysiology of idiopathic menorrhagia?
The aim of this study is to assess the potential role of dynamic MRI including kinematic and dynamic contrast enhanced MR imaging (DCE-MRI) in the evaluation of patients with excessive uterine bleeding. My role was to optimize protocol and develop tools to process quantitative DCE MRI data.
Role: CSU

UL1 TR000040, Irving Institue Imaging Pilot Award
Kristin Myers (PI)
05/01/13-06/30/14
Quantitative Magnetic Resonance Imaging of the Human Cervix
The aim of this imaging core pilot proposal is to develop quantitative magnetic resonance imagining (qMRI) techniques to measure cervical tissue permeability and collagen ultrastructure and to correlate these measures to the overall mechanical strength of the human cervix
Role: Co-Investigator