Rinu Sebastian

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I am a Research Assistant at Keck School of Medicine of USC seeking admission in Doctoral program under biomedical engineering. My main research field is **neural signal processing**. My other research interests include rehabilitation, gait modelling, brain stimulation, MRI volume processing, inverse problems and machine learning.

Education

University of Southern California (USC), Los Angeles *Jan. 2017 – Dec. 2018*
Master of Science in Electrical Engineering

Mahatma Gandhi University (MG University), Kerala, India *Aug. 2009 – May 2013*
Bachelor of Technology in Electronics & Communication Engineering

Research Experience

Dept. of Neurosurgery, Keck School of Medicine of USC *Aug. 2018 – Present*
Advisors: Dr. Brian Lee & Prof. Spencer Kellis

- Investigating effects of frequency and amplitude of stimulation pulse during deep brain stimulation (DBS) for functional mapping of brain in epilepsy patients.
- Involving in neural and behavior data collection, managing data pre-processing pipeline and enhancing signal analysis tools.

The Saban Reseach Institute at Children's Hospital Los Angeles *May 2018 – Dec 2018*
Advisor: Prof. Natasha Lepore

- Incorporated iterative curvature based interpolation (ICBI) approach and improved the quality of low rank total variation (LRTV) algorithm on super-resolved MRI volume by 5%.
- Reviewed computational algorithms to enhance low-resolution MRIs to detect and segment lesions in 200 children with sickle cell disease.

Brain Body Dynamics Lab *May 2017 – Aug. 2017*

- Explored relationship between bio signals (EEG and EMG) generated while subjects exerted force on test objects (spring, dowel) and observed non-existence of correlation between signals and force.

Publications

Beta-Band Power Modulation in the Human Hippocampus during a Reaching Task
Roberto Martin del Campo-Vera, Angad S. Gogia, Kuang-Hsuan Chen, **Rinu Sebastian**, Daniel R. Kramer, Morgan B. Lee, Terrance Peng, Ali Tafreshi, Michael F. Barbaro, Charles Y. Liu, Spencer Kellis, and Brian Lee.
Status: Manuscript under review

Beta-Band Modulation in the Human Hippocampus during a Conflict Response Task
Kuang-Hsuan Chen, Angad S. Gogia, Roberto Martin del Campo-Vera, **Rinu Sebastian**, Morgan B. Lee, Daniel R. Kramer, Terrance Peng, Ali Tafreshi, Michael F. Barbaro, Charles Y. Liu, Spencer Kellis, and Brian Lee.
Status: Manuscript under preparation

Industrial Experience

Tata Consultancy Services Ltd. *Jan. 2014 – Oct. 2016*
Performance Test Engineer

- Conducted performance testing of middleware and frontend layers of an e-commerce platform, investigated test run results to identify bottlenecks, hosted meetings to rectify defects.
- Led a project team of 5 engineers to plan and estimate resources for testing activities and improved average time for load and performance planning by 30%.

Teaching Experience/ Presentations / Posters

- Co-authored 2 posters selected for 2019 SFN Conference
  a) **Neuromodulatory assessment of depth-EEG oscillations in reaching arm movements**
  Roberto Martin del Campo-Vera, Kuang-Hsuan Chen, **Rinu Sebastian**, Daniel R. Kramer, Spencer Kellis, and Brian Lee.
  b) **Sub-cortical human brain modulation during response conflicts in a modified Stroop task**
  Kuang-Hsuan Chen, Roberto Martin del Campo-Vera, **Rinu Sebastian**, Daniel R. Kramer, Spencer Kellis, and Brian Lee.
- Presented modified LRTV algorithm during 2018 CHLA Summer Internship Presentation Series
- Conducted one day workshop on Python and image processing applications for IEEE FISAT student members in 2013.

Course Projects

Neural decoding for decision making — USC
Guide: Prof. Maryam Shanechi — *Fall 2018*

Sit-to-Stand-to-Step modeling — USC
Guide: Prof. Francisco Valero-Cuevas — *Fall 2017*

Object removal and infilling — USC
Guide: Prof. Justin Haldar — *Fall 2017*

Text extraction from videos — MG University
Guide: Prof. Rajesh Roy Cherian — *Spring 2013*

Skills

- Languages: Python, C++, C
- Application Packages and Libraries:: Matlab, GNU Octave, Scilab, EEGLab, FSL, BrainSuite, Chronux, SVN, Git, AWS, Google Cloud, HP LoadRunner, HP Analysis, Eclipse, Visual Code Studio, LaTeX, OpenCV, Tensorflow

Honors and Achievements

- Recipient of All India Council for Technical Education (AICTE) approved merit-based 100% tuition fee waiver during B.Tech program (2009-2013)
- Winner of 2011 R10 (Asia-Pacific zone) IEEE ethics competition held as a part of all Kerala students congress (AKSC) at Chengenoor Engineering College

Membership in Professional Student Bodies

- IEEE (2009-2013), WIE (2010 - 2013), FISAT Free Software Cell (2010 - 2013)

Leadership/ Service

- **Organizing Chair:** Drafted the winning proposal for the 1st combined all Kerala student congress (AKSC) - Women in Engineering (WIE) conference, structured the master-plan, speakers, budget and schedule to host around 30% of the IEEE Kerala Region Student population (350+ students)
- **Co-ordinator:** Organized student teacher and researcher (STAR) program in Adam Public School (Mookkanoor, Kochi) as a part of science, technology, engineering and mathematics (STEM) outreach project

Curriculum vitae (CV) updated on December 23, 2019