Siddharth Biswal

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https://sidsearch.github.io

Education

08/2016-Current **Ph.D. (underway)**, *Georgia Institute of Technology, Atlanta, USA*, School of Computer Science, College of Computing.

- Advisor: Professor Jimeng Sun
- Expected Graduation Date: August 2020

08/2012–12/2013 **Master's of Science**, *Georgia Institute of Technology,Atlanta, USA*, Computer Science.

08/2008–04/2012 **Bachelor's of Science**, *National Institute of Technology, India*, Computer Science .

Interests

Areas Deep Learning, Machine learning for healthcare

Programming Skills

Languages Python, Java, C++, Julia, MATLAB

Deep Learning PyTorch,TensorFlow,Keras, MXNet, Tensorflow Probability

Systems Docker, KuberNetes, Hadoop, Spark, Kafka, AWS

Web Programming Javascript, d3.js, Node.js, Flask(Python)

Professional Experience

05/2019 – 12/2019 **Research Internship**, IQVIA, Cambridge, USA, Worked at IQVIA, Cambridge,Supervised by Cao (Danica) Xiao.

05/2018 – 08/2018 **Research Internship**, IBM Research, Cambridge, USA, Worked at IBM Research, Cambridge,Supervised by Kenney Ng.

- Building multi-modal data generators using Variational Autoencoders and Normalizing Flows[mEVA]

08/2016 – Current **Graduate Research Assistant**, Georgia Institute of Technology, Atlanta, USA, Working in SunLab,Supervised by Prof. Jimeng Sun.

- Electronic health record Generation using generative models[medGAN]
- Clinical Treatment Recommendation System for Epilepsy
- Sleep APNEA detection using physiological signals with neural networks[sleepNET]
- Few-shot learning with metric learning models
- Cardiac Arrest prediction using ECG data using CNN and RNN
- Neural architecture search with reinforcement learning

02/2014 – 06/2016 **Software Engineer** , Massachusetts General Hospital, Boston, USA, Supervised by Dr. Brandon Westover and Dr. Eric Rosenthal.

- Artifact detection method for physiologic signals using Spectral signal processing and machine learning
- Design and Development of physiologic signal acquisition and analysis system
- Development of Information extraction system from EEG and clinical text reports
- Development of algorithm for prediction of delayed cerebral ischemic event from vital sign for Subarachnoid Hemorrhage patients in ICU
- Development of algorithm for Ventilator associated events detecting using physiologic data streams

08/2012 – 12/2013 **Graduate Research Assistant**, Georgia Institute of Technology, Atlanta, USA, Supervised by Prof. John McDonald.

- Identification of differential expression patterns of genes using RNA sequence in breast cancer patients

Research Publications

WWW 2020 **Siddharth Biswal**, Cao Xiao, Lucas Glass, Brandon Westover, Jimeng Sun CLARA: Clinical Report Auto-completion

AAAI 2020 **Siddharth Biswal**, Cao Xiao, Lucas Glass, Elizabeth Milkovits, Jimeng Sun Doctor2Vec: Dynamic Doctor Representation Learning for Clinical Trial Recruitment

AAAI 2020 Limeng Cui, **Siddharth Biswal**, Lucas Glass, Greg Lever, Jimeng Sun, Cao Xiao CONAN: Complementary Pattern Augmentation for Rare Disease Detection

MLHC 2019 **Siddharth Biswal**, Cao Xiao, M Brandon Westover, Jimeng Sun. EEG2Text: Learning to Write Medical Reports from EEG Recording

NeurIPS ML4H Workhop,2018 **Siddharth Biswal**, M Brandon Westover, Jimeng Sun Predicting Electroencephalogram Impressions using Deep Neural Networks,https://arxiv.org/html/1811.07216

JAMIA 2018 **Siddharth Biswal**, Haoqi Sun, Balaji Goparaju, M Brandon Westover, Jimeng Sun Matt T Bianchi Expert-level sleep scoring with deep neural networks,https://academic.oup.com/jamia/article/25/12/1643/5185596

KDD 2018 Yanbo Xu, **Siddharth Biswal**, Shriprasad R Deshpande, Kevin O Maher, Jimeng Sun RAIM: Recurrent Attentive and Intensive Model of Multimodal Patient Monitoring Data,https://arxiv.org/abs/1807.08820

IEEE 2018 Sunil Belur Nagaraj, Lauren M. McClain, Emily J. Boyle, David W. Zhou, Sowmya M. Ramaswamy, **Siddharth Biswal**, Oluwaseun Akeju, Patrick L. Purdon, M. Brandon Westover Electroencephalogram Based Detection of Deep Sedation in ICU Patients Using Atomic Decomposition

Arxiv Preprint **Siddharth Biswal**, Josh Kulas, Haoqi Sun, Balaji Goparaju, M Brandon Westover, Matt Bianchi, Jimeng Sun *SLEEPNET: Automatic Annotation System for Sleep Study using Deep Neural Networks, https://arxiv.org/abs/1707.08262*

MLHC 2017 Edward Choi,**Siddharth Biswal**, Bradley Malin, Jon Duke, Walter F. Stewart, Jimeng Sun *Generating Multi-label Discrete Patient Records using Generative Adversarial Networks, https://arxiv.org/abs/1703.06490*

Journal of Clinical Neurophysiology 2017 — J.A. Kim, E.S. Rosenthal, **S. Biswal**, S. Zafar, A.V. Shenoy, K.L. O'Connor, S.C. Bechek, J. Valdery Moura, M.M. Shafi, A.B. Patel, S.S. Cash, M.B. Westover *Epileptiform abnormalities predict delayed cerebral ischemia in subarachnoid hemorrhage*

Journal of Clinical Neurophysiology 2016 — Ellis Wickering, Nicholas Gaspard, Sahar Zafar, Valdery J. Moura, **Siddharth Biswal**, Sophia Bechek, Kathryn O'Connor, Eris S. Rosenthal, M. Brandon Westover. *Automation of Classical QEEG Trending Methods for Early DCI*

Critical Care Medicine 2016 — Sunil Belur Naharaj, Lauren McClain, David Zhou, Siddharth Biswal, Eris S. Rosenthal, Patrick Purdon, M. Brandon Westover. *Automatic Classification of Sedation Levels in ICU Patients Using Heart Rate Variability*,

IEEE EMBC 2016 — Sunil Naharaj, Ramaswamy S, Siddharth Biswa

, Lauren McClain,Eris S. Rosenthal, Patrick Purdon, M. Brandon Westover. *Heart rate variability as a biomarker for sedation depth estimation in ICU patients* , 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society

IEEE EMBC 2015 — Siddharth Biswal, Zarina Nip, Junior Moura, Matt Bianchi, Eric Rosenthal, Brandon Westover, *Automated information extraction from free-text EEG reports, 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*

Honors and Awards

August 2016 — **Gradute Research Assitantship**, Georgia Institute of Technology.

September 2013 — **1st place in eBay Competition**, Georgia Institute of Technology.

January 2017 — **2nd place in Bloomberg Competition**, Georgia Institute of Technology.

April 2012 — **Top Rank in Undergraduate Studies(1/50)**, National Institute of Technology.

Projects

Georgia Institute of Technology — Development of an optimization framework to discover hierarchical structure in sequential data

Georgia Institute of Technology — Compositional visual question answering method using dynamic memory networks

Mass General Hospital — Designing and developing data visualization portal for viewing waveforms and vital sign data from multiple sources in ICUs at MGH

Mass General Hospital — Automated detection of Ventilator Associated Events using physiologic signal

Harvard Medical School — Cortical reactivation of memory-related gamma activity in human NREM sleep

Independent — Classification challenge to classify HTML documents are sponsered or not(Kaggle Dato Challenge)

Independent — Predict demographics of users based on the behavioral data of mobile usage

Independent — Development of Real time Dashboard showing different metrics from Physiologic signals

Mass General Hospital — Development of EEG-report searching portal using ElasticSearch