

Anil Palepu

apalepu@mit.edu · (248) 990-4073 · www.linkedin.com/in/anilpalepu/ · [apalepu13.github.io](https://github.com/apalepu13)
2036 Massachusetts Ave, Cambridge, MA 02140

EDUCATION

Harvard-MIT Health Sciences and Technology, Cambridge, MA Sep 2020 – Anticipated May 2025

PhD Student: Medical Engineering & Medical Physics

Topic: Self-supervised learning for medical images & text

Coursework: Statistics, NLP, Medicine (Pathology, Neuroscience, Cardiology, Genetics)

Johns Hopkins University, Baltimore, MD Sep 2019 – May 2020

M.S.E: Biomedical Engineering (Biomedical Data Science focus), GPA: 4.0

Topic: Early prognosis of neurological trauma patients in the ICU

Coursework: Machine Learning, Computer Vision, Genomics

Johns Hopkins University, Baltimore, MD Sep 2016 – May 2020

B.S: Biomedical Engineering (Computer Science minor), GPA: 3.81

Coursework: Signal Processing, Biomedical Data Science, Data Structures, Optimization

RESEARCH EXPERIENCE

Beam Lab, Boston, MA Mar 2021 – Present

Self-supervised learning for medical images and text

PhD Student under Dr. Andrew Beam, Harvard T.H Chan School of Public Health, Epidemiology

- Developed a regularized contrastive image-text architecture and zero-shot classification procedure that exceeds performance of a comparable fully-supervised CNN on common chest x-ray diagnoses
- Demonstrated various capabilities of these self-supervised models, including robustness to spurious correlations, capacity for conformal prediction, and zero-shot classification of novel diseases like covid19

MonitOR, Baltimore, MD Apr 2018 – Sep 2020

AI and Computer Vision-based tracking of surgical instruments in the operating room

Research Lead under Dr. Jerry Prince, Johns Hopkins University, Electrical and Computer Engineering

- Collaborated with Johns Hopkins Hospital to reduce costly inefficiencies and “hospital never-events” by developing a CNN-based system for identifying surgical instruments in the operating room
- Designed various critical modules including optical flow-based video compression, temporal prediction post-processing, and event processing to provide instrument usage statistics to hospital administrators

Precision Care Medicine, Baltimore, MD Sep 2019 – May 2020

Early prognosis of neurological trauma patients in the ICU

Team Lead under Dr. Robert Stevens, Johns Hopkins Medicine, Anesthesiology and Critical Care Medicine

- Leveraged first-day physiology and lab data to predict end-of-stay mortality and neurological function for ICU patients presenting with traumatic brain injury, exceeding performance of the standard-of-care model

Neuromedical Control Systems Lab, Baltimore, MD May 2017 – May 2020

Automating EEG analysis for medically refractory focal-onset epilepsy

Student Researcher under Dr. Sridevi Sarma, Johns Hopkins University, Biomedical Engineering

- Developed a signal-processing algorithm for automated spike detection in electroencephalography (EEG)
- Demonstrated that concordance between non-invasive scalp EEG and invasive electrode placement is predictive of surgical success, suggesting potential for non-invasive epilepsy localization

EmboQuant, Baltimore, MD Dec 2016 – May 2019

Establishing a quantitative endpoint for transarterial embolization

Co-founder and Team member under Dr. Clifford Weiss, Johns Hopkins Medicine, Interventional Radiology

- Designed and validated a pressure-sensing catheter for transarterial embolization cancer treatments
- Demonstrated that occluded vessel pressure served as a targetable embolization endpoint and used computer vision to characterize off-target embolization as a function of injection and vessel pressures

TEACHING AND WORK EXPERIENCE

Inspirit AI, Instructor

Sep 2021 – Present

- Taught project-based courses introducing AI to high school students

Medtronic, Data Science Intern

Jun 2019 – Aug 2019

- Built models to predict capacity fade of pacemaker batteries after manufacturing

Johns Hopkins University, Teaching Assistant

Sep 2018 – May 2020

- Delivered weekly recitation lectures as TA for Systems & Controls
- Developed course materials as head-TA for Gateway Computing course
- Provided homework and project help as TA for Data Structures

Spring 2020

Fall 2018 & Fall 2019

Fall 2018

ACTIVITIES

Conference on Health, Inference, and Learning (CHIL), Communications co-chair

Sep 2022 – Present

- Organizing call for papers and advertising efforts for 2023 conference

MIT Graduate Student Council, Representative

Sep 2020 – Present

- Representing the health sciences & technology (HST) department at meetings

HST Joint-Student Council, Representative

Sep 2020 – Present

- Co-led MAAP, an application-assistance program for underrepresented minorities

AWARDS

- Recipient, NIH Neuroimaging Training Program (NTP) Grant Sep 2020 – Aug 2022
- Inducted into Johns Hopkins HKN and AEMB Honor Societies May 2019 & Nov 2019
- Finalist, Johns Hopkins Business Plan Competition (MonitOR) Apr 2019
- 1st Place, Carnegie Mellon McGinnis Venture Competition (EmboQuant) Mar 2018
- Johns Hopkins University Dean's List Dec 2016 – May 2020

PUBLICATIONS & CONFERENCES

- Nov 2022* *Kumar et al. "Towards Reliable Zero Shot Classification in Self-Supervised Models with Conformal..."*
Conference Presentation (Poster), Self-Supervised Learning: Theory and Practice Workshop, NIPS
- July 2022* *Palepu et al. "Self-Supervision on Images and Text Reduces Reliance on Visual Shortcut Features"*
Conference Presentation (Oral), Workshop on Spurious Correlations, Invariance, and Instability, ICML
- May 2022* *Kompa et al. "Artificial intelligence based on machine learning in pharmacovigilance: a scoping review"*
Journal Publication, Drug Safety Vol 45 Issue 5 p. 477-491
- Oct 2021* *Palepu et al. "Digital signatures for early traumatic brain injury outcome prediction in the intensive..."*
Journal Publication, Scientific Reports, Vol 11, Issue 1 p. 1-9.
- June 2021* *Gowda et al. "Establishing a Quantitative Endpoint for Transarterial Embolization from Real-Time..."*
Journal Publication, Journal of Medical Devices, Vol 15, Issue 2
- July 2019* *Palepu et al. "Evaluating Invasive EEG Implantations with Structural Imaging Data and Functional..."*
Conference Presentation (Oral), IEEE Engineering in Medicine & Biology
- July 2017* *Palepu et al. "Automating interictal spike detection: Revisiting a simple threshold rule"*
Conference Presentation (Poster), IEEE Engineering in Medicine & Biology

SKILLS

Technical Interests Programming (Python, R, MATLAB), Deep Learning, Computer Vision, NLP, Signal Processing
Vegetarian Cooking, Tennis, Video Games, Fantasy Books & TV