SAMARTH (SAM) RAWAL

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M.D. Candidate with a research background in the application of Artificial Intelligence (AI) to healthcare. Aiming to pursue a career in medicine to participate, shape and contribute to the profound technological changes coming to healthcare industry to improve lives and the state of public health.

EDUCATION

➢ **MD Candidate, Carle Illinois College of Medicine, University of Illinois at Urbana-Champaign**
  o Expected Graduation: May 2024
➢ **MS in Computer Science with concentration in Biomedical Informatics, Arizona State University**
  o Graduated: May 2020, GPA: 4.0/4.0
  o Thesis: *Multi-Perspective Semantic Information Retrieval in the Biomedical Domain* [https://arxiv.org/abs/2008.01526]
➢ **BS in Computer Science, Arizona State University**
  o Graduated: May 2018, GPA: 4.0/4.0
  o Honors Thesis: *Prescription Information Extraction from Electronic Health Records using BiLSTM-CRF and Word Embeddings* [https://repository.asu.edu/items/48493]

PROFESSIONAL EXPERIENCE

Varatharajah Lab at UIUC (Natural Language Processing / Epilepsy Research)   **Dec 2020 – Present**

  o Focused on semantic parsing of medical records associated with electroencephalogram (EEG) recordings to extract data for auto-generating reports, intelligently filter clinical data, and contribute to self-supervised downstream tasks
  o Currently working on zero-shot clinical classification of free-text reports

Cognition and Intelligence Lab at ASU (Natural Language Processing Research)   **Jan. 2015 – July 2020**

  o The overarching theme of my research under Dr. Chitta Baral has been to leverage NLP across biomedical & clinical data (like Electronic Medical Records) to make actionable decisions that improve efficiency of healthcare delivery
  o Participated in several Clinical NLP Challenges, including Harvard National NLP Clinical Challenge (n2c2); team placed #1 out of 47 teams in n2c2 2018 Track 1 Challenge

Center for Innovation Researcher at Mayo Clinic, Rochester, MN, USA   **July 2018 – June 2020**

  o Integration of AI-powered system to assist Mayo Clinic Oncology department workflows that brings creation time of Cancer Survivorship Care Plan documents by nurses down from ~1 hour to a couple of minutes.
  o Worked with oncologists at the Mayo Clinic to develop a system that automatically extracts data from various places in Electronic Medical Records to automatically generate patient reports using Natural Language Processing techniques, something that is currently done completely manually by nurses.

Bioinformatician at Translational Genomics Research Institute (TGen), Phoenix, AZ   **Jun 2016 – Jun 2017**

  o Developed GeneData, a sophisticated Virtual Reality data visualization program to help doctors clearly and intuitively visualize large amounts of patient genomic information during cancer treatments.
  o Tool used by ASU Biomedical Informatics Department as a demonstration of clinical technology in BMI courses

Software Architecture Intern at Dell CTO Office, Austin, TX   **May 2017 – Aug 2017**

  o Developed software for voice assistants like Amazon Alexa to help users communicate with their PCs intuitively
  o Presented work to a board of Dell management, including the Chief Technology Officer (CTO)

PUBLICATIONS & PRESENTATIONS
Full publication list on Google Scholar.

  o ***SCORE-IT: A Machine Learning Framework for Automatic Standardization of EEG Reports.*** *S Rawal, Y Varatharajah.* 2021 IEEE Signal Processing in Medicine and Biology Symposium (SPMB) – **Best Paper Award**
  o ***Evaluating Latent Space Robustness and Uncertainty of EEG-ML Models under Realistic Distribution Shifts.*** N. Wagh, J. Wei, S. Rawal, B. Berry, Y. Varatharajah. NeurIPS 2022.
  o ***Domain-guided Self-supervision of EEG Data Improves Downstream Classification Performance and*** Generalizability N Wagh, J Wei, S Rawal, et. al. Machine Learning for Health 2021.

- o *Novel evidence synthesis system to support living systematic reviews and living guidelines for cancer immunotherapy*. IB. Riaz, <u>S. Rawal</u>, R. Siddiqi, et. al. Journal of Clinical Oncology, 2020.
- o *Developing and using special-purpose lexicons for cohort selection from clinical notes*. M. Devarakonda, <u>S. Rawal</u>, A. Prakash, et. al. BMC Medical Informatics and Decision Making Journal [accepted, to be published].
- o *Identification of Adverse Drug Reaction Mentions in Tweets–SMM4H Shared Task 2019*. <u>S. Rawal</u>, S. Rawal, S. Anwar, & C. Baral. Proceedings of the Fourth Social Media Mining for Health Applications Workshop. 2019.
- o Posters and Presentations:
  - **Phoenix Symposium on Data Analytics in Healthcare** at University of Arizona School of Medicine – 2019
  - **PLuS Alliance** – Presented work on uncovering insights about effective palliative care via application of large-scale data science on city-level data at the King's College, London – 2019

AWARDS AND ACHIEVEMENTS

- o #1 in Harvard National NLP Clinical Challenge (n2c2): ASU team leader for n2c2 2018 Track 1 competition
  - Team placed #1 out of 47 teams.
  - Built a system to flag potential patients for 13 different clinical trials based off their clinical records with over 90% accuracy
- o #1 at Clinton Global Initiative University (CGI-U) 2017 Codeathon: Ideated and developed Patient Record Access Network (PRAN), a low-cost hardware and software package to address the issue of lack of reliable patient identification methods in rural India.
- o Arizona State University Dean's List: Fall 2014 – Spring 2018 (8 semesters); graduated Summa Cum Laude (B.S.)

INSTRUCTOR AND TA EXPERIENCE

- o **Teaching Assistant for AI in Medicine Certificate Course, UIUC** (Summer 2021 – Spring 2021)
  - Helped create lectures and served as TA for course with UIUC Dept of Bioengineering that served as a Continuing Medical Education (CME) course for physicians and healthcare workers
- o **Instructor for FSE 100 – Introduction to Engineering** undergraduate course at ASU (Fall 2018 – Fall 2020)
  - Responsible for creating and presenting weekly lectures and running weekly labs, as well as student grading
- o **Teaching Assistant for CSE 576 – Natural Language Processing** graduate course at ASU (Fall 2018 – Spring 2020)
  - Responsible for developing class projects and working with student teams throughout the project, along with grading
- o **Math Tutor** at ASU's University Academic Success Programs (UASP) (2015-2016)
  - Worked at the largest math tutoring center among ASU campuses and focused on helping students on a variety of math courses, ranging from Calculus to Discrete Math to Applied Linear Algebra

HOBBIES & PERSONAL PROJECTS

- o **Earned a Visharad (equivalent to Bachelor's Degree) in Hindustani Classical Vocal Music -** Awarded by the Indian Institute of Classical Music, following 10 years of intensive training and performances
- o Accomplished player of Tabla (a North Indian drum instrument) having accompanied various artists in 20+ public performances over the past ten years. Studying Tabla for the past 13 years under a senior disciple of Ustad AllaRakha, one of the most revered, eminent Tabla artist of all time.
- o Gave over 30 Indian classical and light vocal and instrumental public performances over the past nine years
- o Designed, architected, and developed Raag Database, an Android application for categorizing and accessing technical information about components of Indian classical music, with over 30,000 downloads. Provided valuable firsthand experience in using and manipulating data structures.

CLINICAL VOLUNTEERING & EXPERIENCE

- o **CORE Institute** (2019-2020): Volunteering at the MORE Foundation Helping Hands program at the CORE Institute (an orthopedic institute), a nonprofit dedicated to working with young patients with hand developmental issues. Work involves taking patient limb measurements and designing prosthetics via 3D printing to get patients acclimated to use of prosthetics in adulthood