BHANU TEJA GULLAPALLI

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EDUCATION

University of California San Diego Sept '22 - Apr'24 (Expected)
PhD in Halicioğlu Data Science Institute (advised by *Prof. Tauhidur Rahman*)
University of Massachusetts, Amherst (trasnferred to UCSD) Sept '18 - Sep '22
PhD in Computer Science (advised by *Prof. Tauhidur Rahman*)

University of Massachusetts, Amherst Feb '17 - Sept '18
MS in Computer Science
Indian Institute of Technology, Guwahati July '11 - May '15
Bachelor of Technology in Computer Science

RESEARCH INTERESTS

- Wearable Health Sensing
- Machine Learning
- Mobile Health Systems

PAPERS

- Temporal Fusion based Multivariate Analysis for Opioid Misuse Detection Using Cognitive and Psychophysiological Data
  Gullapalli, B.T., *Bedmutha P, Y Luo, T Rahman, and EL Garland*
  (in prep)
- Pharmacokinetics-Informed Neural Network for Predicting Opioid Administration Moments with Wearable Sensors
  Gullapalli, B.T., *EL Garland, Stephanie, C., Brittany, and T Rahman*
  IAAI 2024
- Zoom-Based Mindfulness-Oriented Recovery Enhancement Plus Just-in-Time Mindfulness Practice Triggered by Wearable Sensors for Opioid Craving and Chronic Pain
  EL Garland, ***BT Gullapalli****, KC Prince, AW Hanley, M Sanyer, M Tuomenoksa, and T Rahman*
  Mindfulness 2023
- Impact of individual and treatment characteristics on wearable sensor-based digital biomarkers of opioid use
  Brittany, P.C., ***Gullapalli, B.T.****, Rahman, T., Smelson, D., Boyer, E.W., and Stephanie, C*
  npj Digital Medicine 2022
- OpiTrack: A Wearable-based Clinical Opioid Use Tracker with Temporal Convolutional Attention Networks
  Gullapalli, B.T.*, Stephanie, C., Brittany, P.C., Ganesan, D., Jan, S. and Rahman, T*
  UBICOMP 2021
- Joint prediction of cocaine craving and euphoria using structured prediction energy networks
  Gullapalli, B.T.*, A., Angarita, R.T., Ganesan, D. and Rahman, T*
  MOBISYS 2021 WORKSHOP

[1]Use URL bhanutejagullapalli.github.io in case hyperlinks don't work

- On-body Sensing of Cocaine Craving, Euphoria and Drug-Seeking Behavior Using Cardiac and Respiratory Signals
  ***Gullapalli, B.T.**, Natarajan, A., Angarita, G.A., Malison, R.T., Ganesan, D. and Rahman, T*
  UBICOMP 2019

- A new hierarchical clustering algorithm to identify non-overlapping like-minded communities
  Deepak, T.S., Adhya, H., Kejriwal, S., ***Gullapalli, B.*** *and Shannigrahi, S.,*
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KEY RESEARCH PROJECTS

Predicting Opioid Usage class from Wearable Signals and Cognitive Tasks Sep '22 - Present
Time-series analysis of physiological signals collected during various cognitive tasks. Our goal is to correlate these signals with participants' task performance to predict potential misuse risks.

Pharmacokinetics based modeling for opioid administration Aug '21 - Sep'22
Unlabeled sensor data is initially used to train an upstream Channel-Temporal Attention TCN model using an artificial task motivated by the pharmacokinetics of opioids. This upstream model, along with the physiological signal, combines information from opioid pharmacokinetics to detect opioid administrations IV or orally in the lab and the outpatient setting.

Effectiveness of Mindfulness-based therapy for opioids using wrist watch Oct '21 - May '22
Predicting the effectiveness of mindfulness-based therapy for opioids using heart-rate-variability features captured from a wrist-worn sensor.

Joint prediction of cocaine craving and euphoria using structured prediction energy networks Mar '21 - Apr '21
Joint modeling of cocaine craving and euphoria while using the inherent correlation between these labels with a structured prediction energy network.

Opioid administration using wearable biosensors Jul '19 - Feb '21
Detecting opioid administration using physiological signals obtained from wristband of the subjects admitted to hospital for acute pain using a Channel-Temporal Attention TCN.

Sensing cocaine craving, euphoria and drug-seeking behavior using cardiac and respiratory signals Apr '18 - Feb '19
Built a system that can understand and predict key variables of the addiction loop using ECG and the respiratory signal obtained from a wearable chest band.

Drug Target prediction using Deep Representation Learning Jan '18 - Apr '18
Using graph convolution and attention mechanism, built an interpretable system which can identify proteins affected by a drug.

Tree-Structured Detector Cascade May '17 - Aug '17
Developed a novel way to grow and find the optimal configuration of a tree-structured cascade and tested it to smoking detection.

INDUSTRY EXPERIENCE

Optum AI labs Jun '23 -Sept '23
Built continuous and passive estimation of risk in Type 2 diabetes mellitus (T2DM) subjects using Continuous Glucose Monitoring data. The estimation is then used in a sampling-based algorithm to design and deliver mobile interventions.

Samsung Research America, Digital Health Lab May '22 - Sep '22
Designed a framework to extract heart-rate variability features from Samsung's digital health devices.

Detecting stress using this proposed framework on human subjects with reference sensors undergoing validated stressor tasks.

Samsung R&D Institute, Bangalore, India Jul '15 - Dec '16
Worked in the Video Editor team of Samsung Camera. Primarily worked on Samsungs Video Editor (Pro/Lite), highlight player, Slow Motion. Developed and implemented theme mode in Video Editor Pro which assists the user in creating stories on Samsung Galaxy S8. Bangalore, India

Samsung R&D Institute, Bangalore, India May '14 - Aug '14
Developed a simulation of OLSR (Optimized Link State Routing) Protocol for Tizen OS. Added APIs which extended the functionalities from the Android. Bangalore, India

COURSEWORK

Key Courses: Advanced Natural Language Processing, Advanced Machine Learning, Machine Learning, Machine Learning Theory, Probabilistic Graphical Models, Artificial Intelligence, Advanced Algorithms, Advanced Information Assurance, Research Methods in Empirical Computer Science, Data Science, Ethics, & Society.

TECHNOLOGY & SKILLS

Languages: Python, Java, Android, C/C++, HTML
Tools & Frameworks: Deep learning with Pytorch, Python Machine learning stack (Numpy/scipy, Scikit-Learn, Statsmodels), Git, LaTeX

ACHIEVEMENTS

- Press Coverage of our work to fight opioid epidemic with wearable signals.
- Accepted to Yale's Innovation to Impact program
- My work on opioids has contributed to National science foundation (NSF) smart and connected health grant ($1.1 Million) in 2021 titled *"Collaborative Research: SCH: Psychophysiological sensing to enhance mindfulness-based interventions for self-regulation of opioid cravings"*
- Won the first prize at Samsung R&D Institute Bangalore tech-fair for developing a location-based filter for Samsung video editor.
- Received Spot Award in Samsung R&D Institute Bangalore for providing innovative solutions and exceptional coding skills.
- Listed among top 0.3% students of 0.5 million appearing in Joint Entrance Exam, IIT-JEE 2011
- Secured 961 rank in All India Engineering Entrance Exam (AIEEE) 2011 taken by 1.2 million people