Dr. Tilendra Choudhary, Ph.D.

CONTACT INFORMATION 1501 Snow Crest Trl, Durham, North Carolina-27707, USA

Mobile: +1-4046675618

 ${\it Email:} \ tilendra.choudhary@duke.edu; tilendrachoudhary@gmail.com$

URL: Personal Website in LinkedIn GoogleScholar (h-index: 11)



OBJECTIVE

Placement in an industrial research and development position that allows advanced research in the area of data science, signal processing, and machine learning (ML).

INTERESTS

Physiological signal analysis, bioinformatics, AI and ML for healthcare and other domains

EDUCATION

Ph.D, Electronics and Electrical Engineering, 2020 Indian Institute of Technology Guwahati (IIT G), Assam

M.Tech., Electronics and Communication Engineering (CGPA: 8.93/10), 2015

Indian Institute of Technology Bhubaneswar (IIT BBS), Odisha

B.E., Electronics and Telecommunication Engineering (CPI: 8.21/10), 2012

Chhattisgarh Swami Vivekanand Technical University (State Govt.), Bhilai, Chhattisgarh

EXPERIENCE IN R&D (FULL TIME)

*Post-doctoral Research Fellow,

2024 Mar. - Present

Dept. of Surgery, Duke University, Durham, NC-27707, USA

Post-doctoral Research Fellow,

2022 Apr. - 2024 Feb.

Dept. of Biomedical Informatics, Emory University, Atlanta, GA-30322, USA [Jointly with] Georgia Institute of Technology (Georgia Tech), Atlanta, USA

Domains: To develop DSP and ML-based smart algorithms to analyze multimodal biosignals and EHR-data for assessing critical complications such as sepsis and ARDS. To analyze effect of VNS neuromodulation on PTSD patients using physiological and behavioral analysis.

*Post-doctoral Industrial Experience:

Research Consultant

2021 Nov. - 2022 Mar.

Research Engineer

2021 Feb. - 2021 Oct.

Brigosha Technologies Pvt Ltd (R&D), #780 HSR Layout Bangalore, Karnataka-560102, India *Domain:* Autonomous driving and machine learning: Developed a deep learning-based traffic scene perception from LiDAR 3-D sensor-data and assisted tracking, *Tools:* Python, MATLAB

*Ph.D. Research Scholar

2015 July - 2020 Oct.

Department of EEE, IIT Guwahati, Guwahati, Assam-781039, India

Dissertation: Waveform Delineation and Analysis of Seismocardiographic Signals

Focus: With signal processing and machine learning, I developed several SCG characterization and delineation frameworks for different applications (e.g., cardiac event detection, heart rate variability, breathlessness identification) and also developed sensing hardware devices, GUIs and mobile applications. *Tools:* MATLAB, Python, NI Multisim, BIOPAC system, Arduino

*M.Tech. Scholar

2013 July - 2015 July

School of Electrical Sciences, IIT Bhubaneswar, Argul, Khordha, Odisha-752050, India *Dissertation:* Delineation Frameworks for PPG and ECG Signals. *Tools:* MATLAB

SELECTED
JOURNAL
PUBLICATIONS

- **Tilendra Choudhary** et al., "Derivation and Validation of Generalized Sepsis-induced Acute Respiratory Failure Phenotypes Among Critically III Patients: A Retrospective Study," *BMC Critical Care*, vol. 28, no. 1, pp. 321, Oct. 2024. (IF: 8.8) [Link].
- **Tilendra Choudhary** et al., "Identification of Human Breathing-States Using Cardiac-Vibrational Signal for m-Health Applications," *IEEE Sensors Journal*, vol. 21, no. 3, pp. 3463-3470, 2021. DOI: 10.1109/JSEN.2020.3025384. (#citations:17, IF:4.3)
- Tilendra Choudhary et al., "Automatic Detection of Aortic Valve Opening using Seismocardiography in Healthy Individuals," *IEEE Journal of Biomedical and Health Informatics*, vol. 23, no. 3, pp. 1032-1040, 2019. (#citations:65, IF:7.7, It was featured on the cover of journal's sub-column, and as an 'Editor's Pick' for the May 2019 issue.)

• Tilendra Choudhary, M.K. Bhuyan, and L.N. Sharma, "Delineation and Analysis of Seismocardiographic Systole and Diastole Profiles," IEEE Transactions on Instrumentation and Measurement, vol. 70, Art no. 4000108, pp. 1-8, 2021. (#citations:10, IF:5.6)

- PATENTS FILED 1) "Method and Technology for Accelerometric Signal Recording of a Novel Vibrocarotidogram (ViCG) with Seismocardiogram (SCG)," in Indian Patent, 2020. Ref. No.: 202031026802
 - 2) "Device and Method for Seismocardiography Recording and Monitoring in Mobile Device for Healthcare Applications," in Indian Patent, 2020. Ref. No.: 202031027314

ACHIEVEMENTS & OTHER **EXPERIENCES**

- **#PUBLICATIONS:** 16 Journals, 12 Conferences, 2 Preprints, 2 filed patents.
- EPIC system deployment of the sepsis-induced ARF phenotyping model is currently under process at Emory University for its prospective use in ICU.
- Administered brain imaging and physiological waveform data acquisition of acute stressed and PTSD patients at Emory University Hospital.
- Was the part of a working group to standardize the physiological waveforms format in the Bridge2AI for Clinical Care Project [zenodo link].
- · Worked in collaboration with Evren Technologies Inc., GeorgiaTech, University of Pittsburgh, MIT, Altanta VA medical center.
- Mentored many PhD, MS and undergraduate students.
- MHRD, Govt. of India Scholarship for my PhD (2015-20) & MTech (2013-15).
- Young Researcher Award 2021 by Institute of Scholars (InSc), 2021.
- · Invited talks:
 - Speaker, Research Friday Duke University, "ML-derived Unique Phenotypes for Sepsis-induced Acute Respiratory Failure (ARF) in ICU", Oct. 18, 2024.
 - Speaker, AI in Healthcare Engineering, NECBH, IIT Guwahati, Mar. 28-30, 2019,
 Speaker, Workshop on MATLAB, RSF-EEE, IIT Guwahati, Mar. 09-10 2019.
- Reviewer of many IEEE, Elsevier, npj, Nature and ACM, journals and conferences.
- Grant proposal development experience: Assisted for NIH R01 submission, Jul 2023.
- Developed hardware circuit design for SCG and ViCG signals acquisition.
- Devised biometric recognition systems using ECG/PPG signals.
- · Contributed for book-preparation, "Computer Vision and Image Processing: Fundamentals and Applications," CRC Press, 2019.
- Attended workshop on "Tutorial Series on Deep Learning using Tensorflow (TSDLT)," IEEE Branch, IIT Guwahati, Oct. 2018.

TEACHING ASSISTANCE

Digital Electronics Circuit Lab, Analog Electronics Lab, Signal and System Lab and Tutorial, Design Laboratory, Basic Electronics Tutorial, Probability and Randam Processes Tutorial

EDITORIAL EXPERIENCE

*Review Editor, Biomedical Signal Processing, Frontiers in Signal Processing (SP) *Topic Editor, Smart Biomedical Signal Analysis with Machine Intelligence, Frontiers in SP

MEDIA **COVERAGE**

- Physician's Weekly: Sepsis-Induced ARF Phenotypes Show Special Organ Injury Characteristics & Clinical Outcomes Differences, Oct 2024. [Link]
- MedScape: Transcranial VNS Tied to Improved Cognition in PTSD, Jul 2023. [Link]
- GLOBE NEWSWIRE: gammaCore (Non-Invasive Vagus Nerve Stimulation; nVNS) Improves Attention and Memory in Patients with PTSD, Jul 2023. [Link]
- GLOBE NEWSWIRE: gammaCore nVNS Improves Attention and Working Memory in Patients with Post Traumatic Stress Disorder (PTSD), Sept 2023. [Link]

SKILLS

Coding skills: MATLAB, Python, basic C/C++, Pytorch, Tensorflow Software editor tools: Spyder, Pycharm, Cloudcompare, Dataiku Simulation skills: NI Multisim, MATLAB, Simulink, PSpice

Type-setting skills: LATEX, MS Office Embedded programming skills: Arduino

Lab-equipments handled: DSO, BIOPAC system (MP36,45,150,160), CNAP 500 BP monitor

REFERENCES CONTACT

Dr. Rishikesan Kamaleswaran, Asso. Prof. Duke Univ., USA, r.kamaleswaran@duke.edu.[url] AVAILABLE TO **Prof. M.K. Bhuyan**, Prof. Dept. of EEE, IIT Guwahati, India, mkb@iitg.ac.in.[url]] Prof. Shaik Rafi Ahamed, Prof. Dept. of EEE, IIT Guwahati, India, rafiahamed@iitg.ac.in.[url]