HARSHIT TOMAR

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PERSONAL SUMMARY

An inquisitive student, a keen learner, and a problem solver, always willing to dive deep into a problem for novel solutions. I look forward to challenging opportunities to redefine my potential and leave an impact. Highly interested in Bio-Medical Signal Processing, Wearable Devices, Virtual Reality, and Applications of Machine Learning in Bio-Signal Analysis. To date, my projects have resulted in patent, and articles in the journals of Elsevier and IEEE.

WORK EXPERIENCE

PROJECT INTERN, Supervisor: Guillermo Bernal — **Cambridge, USA**
MIT MEDIA Lab (Fluid Interfaces Group) — ***August 2021 – Present***

- Currently collaborating on a project based on Affective VR.

RESEARCH INTERN, Supervisor: Dr. Tiago H. Falk — **Montreal, Canada**
MuSAE Lab (INRS-EMT) — ***May 2021 – Aug 2021***

- Worked to measure engagement levels using ECG and BVP signals in a VR environment.
- Performed an extensive literature survey to choose best features.

RESEARCH INTERN, Supervisor: Dr. Mohamed Elgendi — **Manitoba, Canada**
University of Manitoba — ***Mar 2021 – May 2021***

- Worked on the issue of biasness in pulse oximeters by utilizing the data created.
- Extracted and represented data consisting PPG signals.

UNDERGRADUATE STUDENT RESEARCHER, Supervisor: Dr. Rama Komaragiri — **Greater Noida, India**
Collaborating Supervisors: Dr. Manjeet Kumar (DTU, Delhi) and Dr. Ashish Kumar (VIT Chennai)
Electronics Department, Bennett University — ***Mar 2020 – Feb 2021***

- Worked on developing Biomedical Signal Processing algorithms suitable for VLSI implementation.
- Attained the basics of Signal Processing and Multivariate DSP.

PUBLICATIONS AND PROJECTS

1. PATENTS

- Electroencephalography (EEG) Monitoring Device
  Indian Patent (Application Number: 202111000601)

2. JOURNAL ARTICLES

- Stationary wavelet transform based ECG signal denoising method.
  Kumar, A., ***Tomar, H.***, Mehla, V., Kumar, M., Komaragiri, R. ISA Transactions, ELSEVIER. DOI
- A novel algorithm for R-peak detection using convolution followed by HRV analysis.
  Harshit Tomar, Ashish Kumar., Manjeet Kumar, Rama Komaragiri. *Under review in the Elsevier Journal.*
- The striking need for age diverse pulse oximeter databases.
  Mohamed Elgendi, Richard R. Fletcher., ***Harshit Tomar***, John Allen, Rabab Ward, Carlo Menon. Translational Medicine, Frontiers.

3. CONFERENCE ARTICLES

- Classification of normal and abnormal ECG signals using support vector machine and fourier decomposition method.
  Kumar, A., Mehla, V., ***Tomar, H.***, Kumar, M., Komaragiri, R. IEEE-iSES 2020. DOI
  (Selected for the special issue of Springer Nature Computer Science Journal)

4. ON GOING PROJECTS

- Engagement analysis using using ECG and BVP signals in an IVE.
- Noise detector in an ECG signal using superlet transform and deep learning.
- Review paper on selecting features for engagement analysis.

- Training VR avatars to allow them to become more expressive in VR environment using EMG signals.

EDUCATION

BACHELOR OF TECHNOLOGY, CGPA: 8.11 (Till 6th Sem) **Greater Noida, India**
Bennett University ***Jul 2018 – May 2022 (Tentative)***

- Part of sports committee and also serving in university's badminton team.
- **Relevant Courses:** Signals and System, Digital Signal Processing, Analog Circuits I and II, Probability Theory and Stochastic Processes, Machine Learning.

HIGHER SECONDARY (GRADE 12) **Noida, India**
Sarla Chopra D.A.V Public School, Noida ***May 2016 – Mar 2018***

- Graduated with aggregate marks of 92%.
- Led the school's handball team and participated in badminton championships.

TECHNICAL SKILLS

- MATLAB
- Lt Spice
- Mathematica
- Python
- LaTeX
- C++
- VHDL
- Symica

CO-CURRICULAR ACTIVITIES

ORGANISING BOARD (APPS AND ANALYTICS) ***April 2020 – April 2021***
Sports Department, Bennett University Credentials

- Worked on launching an app to handle all the activities of the sports department.

COMMUNITY SERVICE ***1st Jun 2019 – 15th Jul 2019***
Child Care & Development Foundation Credentials

- Worked in the education department as teaching faculty.

ACHIEVEMENTS

- Led and finished in the Top 10 Teams at Tinker-Hack (Hackathon) held at IIIT Delhi, India.
- Qualified NGSE (National Genius Search Examination).
- Participated in and won the various zonal and state-level competitions in sports.
- Accepted by Bennett University with 30% of student scholarship.
- Selected in undergraduate summer research internship program at MuSAE Lab, INRS-EMT, Montreal, Canada.

SOFT SKILLS

- Leadership
- Time Management
- Self Motivation
- Teamwork

HOBBIES

- Badminton
- Handball
- Singing
- Trekking

LANGUAGES

- English ~ Professional
- Hindi ~ Mother Tongue
- German ~ Beginner