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, Frontiers, and IEEE.

✚ WORK EXPERIENCE

PROJECT INTERN, Supervisor: Guillermo Bernal   **Cambridge, USA**
MIT MEDIA Lab (Fluid Interfaces Group)   *Aug 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. DOI
  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. *~ Almost complete*
- Noise detector in an ECG signal using superlet transform and deep learning. *~ Currently working*
- Review paper on selecting features for engagement analysis. *~ Ready for submission to a journal*

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

✚ 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
- LaTeX
- Lt Spice
- C++
- Mathematica
- VHDL
- Python
- 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
- Photography
- Trekking

✚ LANGUAGES

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