KULBHUSHAN CHAND

Post Doctoral Fellow,
Technology Innovation Hub,
Indian Institute of Technology Mandi,
VPO Kamand, District Mandi, HP, India – 175075

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Persistent Email: kulbhushan.chand@gmail.com
Website: kulbhushanchand.github.io

EDUCATION

PhD   **2015 – 2022**
National Institute of Technology Jalandhar
Electronics and Communication Engineering
CGPA: 9.0

MTech   **2011 – 2013**
Lovely professional University
Electronics and Communication Engineering
Graduated with Hons. and University Topper, CGPA: 9.12

BTech   **2006 – 2010**
Guru Nanak Dev University
Electronics and Communication Engineering
Graduated with Hons., %Marks: 78.05

RESEARCH EXPERIENCE

Post Doctoral Fellow   **Nov 2022 – Present**
Indian Institute of Technology Mandi
Technology Innovation Hub
***Project:** Multisensory Human Computer Interaction and Biofeedback; **Advisor:** Prof. Varun Dutt*

Pre Doctoral Fellow   **Jun 2022 –Nov 2022**
Indian Institute of Technology Mandi
Technology Innovation Hub
***Project:** Multisensory Human Computer Interaction and Biofeedback; **Advisor:** Prof. Varun Dutt*

Project Team Member   **Apr 2020 – Mar 2024**
ISRO Space Technology Incubation Center (S-TIC), National Institute of Technology Jalandhar
***Project:** Strengthening Ridge to Valley based NRM planning under Mission Water Conservation using Geospatially enabled Serious Gaming; **Advisor:** Prof. Varun Dutt*

Doctoral Researcher   **Aug 2015 – Apr 2022**
National Institute of Technology Jalandhar
Department of ECE
***Dissertation:** Low cost multimodal biofeedback for mental relaxation; **Advisor:** Prof. Arun Khosla*

MTech Researcher   **Jul 2011 – Jun 2013**
Lovely professional University
Department of ECE
***Dissertation:** A new approach for ECG signal denoising using Adaptive Filtering*

TEACHING EXPERIENCE

Teaching Assistant   **Aug 2015 – Jul 2020**
National Institute of Technology Jalandhar
Department of ECE

Assistant Professor   **Jul 2013 – Jul 2015**
Lovely Professional University
Department of ECE

Teaching Assistant   **Jan 2012 – Nov 2012**
Lovely Professional University
Department of ECE

Lecturer   **Dec 2010 – May 2011**
Lovely Professional University
Department of ECE

PEER-REVIEWED PUBLICATIONS

Journals - Peer reviewed research papers

Chand, K., Chandra, S., & Dutt, V. (2024). Raga Bhairavi in virtual reality reduces stress-related psychophysiological markers. Scientific Reports, 14(1), 24816. (**SCI, IF: 4.3**)

Chand, K., Chandra, S., & Dutt, V. (2024). A comprehensive evaluation of linear and non-linear HRV parameters between paced breathing and stressful mental state. Heliyon, 10(11). (**SCI, IF: 3.9**)

Chand, K., & Khosla, A. (2022). BioNES: A plug-and-play MATLAB-based tool to use NES games for multimodal biofeedback. SoftwareX, 19, 101184. (**SCI, IF: 3.1**)

Chand, K., & Khosla, A. (2022). Efficacy of Using Retro Games in Multimodal Biofeedback Systems for Mental Relaxation. International Journal of Gaming and Computer-Mediated Simulations (IJGCMS), 14(1), 1–23. (**Scopus**)

Chand, K., & Khosla, A. (2022). MATLAB-Based Real-Time Data Acquisition Tool for Multimodal Biofeedback and Arduino-Based Instruments: Arduino Firmata Data Acquisition (AfDaq). Journal of Information Technology Research (JITR), 15(1), 1–20.

Conferences - Peer reviewed research papers/abstracts (*)

Chand, K., Khosla, A., & Dutt, V. (2025). Towards Affordable Biofeedback System for Mental Relaxation. Mind, Brain, and Consciousness Conference (MBCC 2025), IIT Mandi, India. [In Press]

Chand, K., Chandra, S., & Dutt, V. (2023). Effects of Relaxed and Stressful Mental States on the Heart Rate Variability Parameters. Mind, Brain, and Consciousness Conference (MBCC 2023), India. *****

Chandra, S., **Chand, K.**, & Dutt, V. (2023). Impact of Indian Classical Raga in Immersive Environments on Human Psycho-physiological Parameters. Proceedings of the 16th International Conference on PErvasive Technologies Related to Assistive Environments. PETRA '23, Corfu, Greece.

Rao, A. K., Fatma, Z., Menon, V. K., Bhavsar, A., Chowdhury, S. R., Chandra, S., Dutt, V., & **Chand, K.** (2023). Prediction of decision-making performance post-longitudinal tDCS administration via EEG features and machine learning. Proceedings of the 16th International Conference on PErvasive Technologies Related to Assistive Environments. PETRA '23, Corfu, Greece.

Book Chapters

Jain, B., Khosla, A., **Chand, K.**, & Ahuja, K. (2019). The Pursuit of Zero Food Waste: A Gamified Approach Promoting Avoidance of Dormitory Mess Food Wastage in Educational Institutions. In Global Initiatives for Waste Reduction and Cutting Food Loss (pp. 243–267). IGI Global.

Mukherjee, A., Goyal, P., Singh, A., Khosla, A. K., Ahuja, K., & **Chand, K.** (2019). Pursuit of Research: A Gamified Approach Promoting Research Engagement Among Undergraduate Students. In Fostering Multiple Levels of Engagement in Higher Education Environments (pp. 132–155). IGI Global.

Padmakar, G. S. V., Khosla, A., & **Chand, K.** (2019). LearnEasy-Android Application as a Technological Intervention for Children With Dyslexia. In Emerging Trends in the Diagnosis and Intervention of Neurodevelopmental Disorders (pp. 236–248). IGI Global.

Setia, D., Singh, R., Sharma, A., Khosla, A., Ahuja, K., & **Chand, K.** (2019). Enhancing Tourism and Cultural Experience Through Gamification. In Positioning and Branding Tourism Destinations for Global Competitiveness (pp. 152–171). IGI Global.

Manuscripts in preparation or Review

Chand, K., Khosla, A., & Dutt, V. (2025). Efficacy of HRV biofeedback system for mental relaxation [In preparation].

Chand, K., Chandra, S., & Dutt, V. (2025). Heart coherence under paced breathing and stressful [In preparation].

Chand, K., Chandra, S., & Dutt, V. (2025). Effects of listening to Raga Bhairavi on heart coherence [In preparation].

CONFERENCE PRESENTATIONS

Towards Affordable Biofeedback System for Mental Relaxation — Jun 2025
  Mind, Brain, and Consciousness Conference (MBCC) - 2025
  Indian Institute of Technology Mandi

Effects of Relaxed and Stressful Mental States on the Heart Rate Variability Parameters — Dec 2023
  Mind, Brain, and Consciousness Conference (MBCC) - 2023
  Indian Institute of Technology Mandi

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Realtime arduino based HRV biofeedback system for mental stress assessment *Status: Applied*	Apr 2025
Arduino Firmata Data Acquisition (AfDaq) *Status: Applied*	Apr 2025
Biofeedback Nintendo Entertainment System (BioNES) *Status: Applied*	Apr 2025
MCP4251 *Status: Applied*	Apr 2025

INVITED TALKS (*) / WORKSHOPS (#)/ LECTURES

Human Motivation and Engagement Analysis using Octalysis Gamification Framework * *Indian Institute of Technology Mandi* *5th Winter School on Cognitive Modeling - 2023*	Oct 2023
Octalysis Gamification Framework *National Institute of Technology Jalandhar* *Guest Lecture for undergraduate course Gamification (ECOE-496)*	Feb 2023
Octalysis Gamification Framework *National Institute of Technology Jalandhar* *Guest Lecture for undergraduate course Gamification (ECX-488)*	Sep 2022
Human Motivation and Engagement Analysis using Octalysis Gamification Framework * *Indian Institute of Technology Mandi* *Winter School on Cognitive Modeling - 2022*	Oct 2022
Octalysis * *National Institute of Technology Jalandhar* *AICTE ATAL Sponsored Online Faculty Development Program on Gamification*	Nov 2020
Arduino and Open-Source Technologies # *DAV Institute of Engineering and Technology*	Jun 2019
Arduino workshop for kids # *Jalandhar*	Nov 2017

GRANTS (*PI, #CO-PI)

Nagarro-NITJ Technology Centre of Excellence for Autism Research, *Nagarro, CSR Grant* # *Status: Under review*	2024
AI-Driven Multimodal Fusion Framework for Emotion Recognition of Individuals with Autism in – Unconstrained Environments, *Futures First, CSR Grant* # *Status: Under review*	2024
Low-Cost Smartwatch for Autism with AI-Enabled Technologies, *NXP Semiconductors, CSR Grant* # *Status: Under review*	2024

HONORS AND AWARDS

Post Doctoral Fellowship *Indian Institute of Technology Mandi*	2022 – 2025
Pre Doctoral Fellowship *Indian Institute of Technology Mandi*	2022
Doctoral Fellowship *National Institute of Technology Jalandhar*	2015 – 2022
UGC NET Qualified with JRF *University Grants Commission*	2013
GATE Qualified *Ministry of Education*	2013
University Academic Honor *Lovely Professional University*	2013
Academic Scholarship *Lovely Professional University*	2011 – 2013
GATE Qualified	2011

Ministry of Education

University Academic Honor   2010
  Guru Nanak Dev University

Academic Scholarship   2006 – 2010
  Guru Nanak Dev University

ACADEMIC SERVICE / OUTREACH ACTIVITY

Mind, Brain, and Consciousness Conference (MBCC 2023)   Dec 2023
  Indian Institute of Technology Mandi, Role: Workshop Organizer

Jury Member; Hackathon 2022   Jul 2022
  Indian Institute of Technology Mandi, Role: Jury member

Toycathon 2021   Jan 2021
  Ministry of Education, Role: Primary Evaluator

ATAL Online FDP on Gamification   Nov 2020
  National Institute of Technology Jalandhar, Role: Assisted in conduction

GIAN Course on Autism and Assisted Technologies   Dec 2018
  National Institute of Technology Jalandhar, Role: Assisted in conduction

MEDIA COVERAGE

Raga Bhairavi can lower stress levels: Study explores impact of Indian classical music   Nov 2024
  The Telegraph India, Print and online newspaper

Young minds dwell on e-concepts   Nov 2017
  The Tribune India, Print and online newspaper

PROFESSIONAL DEVELOPMENT

Conference (*Presented/ #Attended)

Mind, Brain, and Consciousness Conference (MBCC 2025) *   Jun 2025
  Indian Institute of Technology Mandi

CHI 2025 #   Apr 2025
  Yokohama, Japan

Mind, Brain, and Consciousness Conference (MBCC 2023) *   Dec 2023
  Indian Institute of Technology Mandi

Short Term Courses/Workshops/Webinars (Attended)

The Impact of AI on Gamification and Serious Games   Sep 2024
  Shri Vaishnav Vidyapeeth Vishwavidyalaya

Development of Simulation Game, "Project PAL" using the SECI Model and Collaborative -   Jul 2024
  Learning Methods
  Shri Vaishnav Vidyapeeth Vishwavidyalaya

Hands on Training and Showcasing: High Density EEG Devices   Mar 2024
  Indian Institute of Technology Mandi

Simulation Games: A Bridge between Knowledge and Behaviour   Jan 2024
  Shri Vaishnav Vidyapeeth Vishwavidyalaya

Machine-Learning advances in Human-Computer Interaction   Jul 2022
  Indian Institute of Technology Mandi

Innovation, IPR and Start-ups   Jul 2022
  National Institute of Technology Jalandhar

LaTeX for Technical Writing   June 2022
  Indian Institute of Technology Mandi

The Education Factory   Sep 2020
  National Institute of Technology Jalandhar

Machine Learning Using Python   Sep 2020
  National Institute of Technology Jalandhar

Computational Cardiac Engineering - Predictive Modelling and Innovative Sensing Systems   Sep 2020
  Rajasthan Technical University

Autism and Assisted Technologies (Gian Course)   Dec 2018
  National Institute of Technology Jalandhar

Brain Science & Technology: Tools and Techniques to understand the Human Brain	Dec 2016
Indian Institute of Technology Delhi	
Biology for Engineers	Jun 2016
Indian Institute of Technology Bombay	

Certifications

The Octalysis Framework - Level 1	Dec 2017
The Octalysis Group	

MOOC Courses (with certificates)

IITM – Finland – Certificate course on Mastering VR : Fundamentals to Practice	Oct 2024
Indian Institute of Technology Madras	
DRONE01x: Drones for Agriculture: Prepare and Design Your Drone (UAV) Mission	Sep 2022
Wageningen University & Research	
Statistics in Medicine	Mar 2020
Stanford University	
Computer Science 101	Mar 2020
Stanford University	
Introduction to CAD: Learn Fusion 360 in 90 minutes	Sep 2019
Autodesk	
Vital Signs: Understanding What the Body Is Telling Us	May 2018
University of Pennsylvania	
Advanced MATLAB for Scientific Computing	Dec 2017
Stanford University	
Introduction to Game Development	Mar 2017
Michigan State University	
Calculus One	May 2013
The Ohio State University	
Image and video processing	Mar 2013
Duke University	

PROFESSIONAL MEMBERSHIP

Association for Computing Machinery (ACM)	Aug 2023 – Jul 2024
Professional Member	

EDITORIAL REVIEW BOARD

IGI Global: International Journal of Gaming and Computer-Mediated Simulations (IJGCMS); International Journal of Game-Based Learning (IJGBL); International Journal of Distance Education Technologies (IJDET)

AD-HOC REVIEWER

Springer Nature: Discover Psychology; Signal, Image and Video Processing

Cell Press: iScience; Heliyon

Elsevier: SoftwareX; HardwareX; Biomedical Signal Processing and Control

Mary Ann Liebert, Inc.: Games for Health Journal

IGI Global: International Journal of Gaming and Computer-Mediated Simulations (IJGCMS); International Journal of Game-Based Learning (IJGBL); International Journal of Distance Education Technologies (IJDET)

INDUSTRY/STARTUP EXPERIENCE

T4A Labs Pvt Ltd., Incubated in NITJ Technology Business Incubator	**Apr 2022 – Present**
Role: Co-Founder, Works on technologies for autistic kids and autism.	

SKILLS

Programming: Assembly, C, C++, R, Lua, MATLAB, Python, Visual Basic, Pure Data

Applications: NI Multisim, KiCad, Unity3D, RStudio, JASP, Jamovi, Autodesk Fusion 360

Operating Systems: Windows, Ubuntu

Others: Octalysis-Level1 Gamification Expert, Heart Rate Variability (HRV) Analysis

PROJECTS

ICT mediated teaching pedagogy and content/ Development of new and innovative courses and curricula

Arduino Workshop for Kids E-Book *National Institute of Technology Jalandhar*	2022
Gamification (ECX-488) Course E-Book, 3 Credits *National Institute of Technology Jalandhar*	2021
Classroom Gamification, Software Tool, 3 Credits *National Institute of Technology Jalandhar*	2018
Gamification (ECX-488), Course, 3 Credits *National Institute of Technology Jalandhar*	2016

Other Projects

AfDaq: A plug and play MATLAB based tool for biofeedback and arduino based instruments *https://github.com/kulbhushanchand/AfDaq*	2021
BioNES: A plug-and-play MATLAB based tool to use NES games for multimodal biofeedback *https://github.com/kulbhushanchand/BioNES*	2021
MCP4251: Arduino library for MCP4251 Digital Potentiometer *https://github.com/kulbhushanchand/MCP4251*	2021
classroom-gamification: Tool to gamify your classroom with an online leaderboard *https://github.com/kulbhushanchand/classroom-gamification*	2018

SUBJECTS TAUGHT

Teaching Assistant (PhD Student) *National Institute of Technology Jalandhar*	**2015 – 2020**
Gamification, ECX-488	Spring 2020
Scientific Computing Lab, ECPC-351	Spring 2020
Gamification, ECX-488	Fall 2019
Scientific Computing Lab, ECPC-351	Fall 2019
Gamification, ECX-488	Spring 2019
Electronics for Chemists Lab, CY-592	Spring 2019
Gamification, ECX-488	Fall 2018
Analysis and Synthesis of Networks Lab, ECX-211	Fall 2018
Gamification, ECX-488	Spring 2018
Electronics for Chemists Lab, EC-636	Spring 2018
Gamification, ECX-488	Fall 2018
Analysis and Synthesis of Networks, ECX-201	Fall 2018
Analysis and Synthesis of Networks Lab, ECX-211	Fall 2018
Gamification, ECX-488	Spring 2017
Basic Electronics Lab, ECX-102	Spring 2017
Gamification, ECX-488	Fall 2016
Analysis and Synthesis of Networks Lab, ECX-211	Fall 2016
Gamification, ECX-488	Spring 2016
Basic Electronics Lab, ECX-102	Spring 2016
Basic Electronics Lab, ECX-102	Fall 2015
Assistant Professor *Lovely Professional University*	**2013 – 2015**
Digital Signal Processing, ECE300	Spring 2015
Digital Signal Processing Laboratory, ECE324	Spring 2015
Analytical Skills-II, PEA302	Spring 2015
Adaptive Signal Processing, ECE531	Fall 2014
Signal and Systems, ECE220	Fall 2014
Basic Simulation Laboratory, CSE222	Fall 2014
Electronic Devices and Circuits, ECE206	Summer 2014

Digital Signal Processing, ECE300	Spring 2014
Probability and Stochastic Processes, ECE256	Spring 2014
Digital Signal Processing Laboratory, ECE324	Spring 2014
Electronic Devices and Circuits, ECE206	Fall 2013
Basic Electrical Engineering, ECE133	Fall 2013
Analog and Linear Integrated Circuits Laboratory, ECE317	Fall 2013
Basic Electrical Engineering Laboratory, ECE134	Fall 2013

Teaching Assistant (MTech student)   **2011 – 2013**
Lovely Professional University

Introduction to Practical Electronics, ECE100	Fall 2012
Electrical and Electronics Workshop, ECE130	Spring 2012

Lecturer   **2010 – 2011**
Lovely Professional University

Microcontroller and Applications, ECE310	Spring 2010
Introduction to Practical Electronics, ECE100	Spring 2010
Unified Electronics Laboratory – II, ECE208	Spring 2010

SPORTS ACTIVITIES

Annual Faculty Sports Meet   2015
Lovely Professional University
100 mt. (Gold), 200 mt. (Gold)

Annual Faculty Sports Meet   2014
Lovely Professional University
200 mt. (Bronze), 400 mt. (Silver)

Annual Faculty Sports Meet   2011
Lovely Professional University
100 mt. (Gold)

LANGUAGES

English – Proficient (Speak, Read, Write, Listen)

Hindi – Native-equivalent (used since childhood)

Punjabi – Native (Mother tongue)

REFERENCES

Prof. Varun Dutt
Professor, School of Computing and Electrical Engineering, Indian Institute of Technology Mandi, Mandi, Himachal Pradesh, India – 175075
varun@iitmandi.ac.in
Professional Engagement: Post Doctoral Supervisor

Prof. Arun Khosla
Professor, Department of ECE, Dr B R Ambedkar National Institute of Technology, Jalandhar, India – 144011
khoslaak@nitj.ac.in
Professional Engagement: PhD Supervisor

Prof. Mamta Khosla
Professor, Department of ECE, Dr B R Ambedkar National Institute of Technology, Jalandhar, India – 144011
khoslam@nitj.ac.in
Professional Engagement: Former Head of Department

Gaganpreet Singh
Senior Software Developer, Microsoft India
gagsin@microsoft.com
Professional Engagement: Former coworker