




KULBHUSHAN CHAND

Post Doctoral Fellow,
Technology Innovation Hub,
Indian Institute of Technology Mandi,
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EDUCATION

PhD National Institute of Technology Jalandhar Electronics and Communication Engineering CGPA: 9.0	2015 – 2022
MTech Lovely professional University Electronics and Communication Engineering Graduated with Hons. and University Topper, CGPA: 9.12	2011 – 2013
BTech Guru Nanak Dev University Electronics and Communication Engineering Graduated with Hons., %Marks: 78.05	2006 – 2010

RESEARCH EXPERIENCE

Post Doctoral Fellow Indian Institute of Technology Mandi Technology Innovation Hub Project: Multisensory Human Computer Interaction and Biofeedback; Advisor: Prof. Varun Dutt	Nov 2022 – Present
Pre Doctoral Fellow Indian Institute of Technology Mandi Technology Innovation Hub Project: Multisensory Human Computer Interaction and Biofeedback; Advisor: Prof. Varun Dutt	Jun 2022 – Nov 2022
Project Team Member 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	Apr 2020 – Mar 2024
Doctoral Researcher National Institute of Technology Jalandhar Department of ECE Dissertation: Low cost multimodal biofeedback for mental relaxation; Advisor: Prof. Arun Khosla	Aug 2015 – Apr 2022
MTech Researcher Lovely professional University Department of ECE Dissertation: A new approach for ECG signal denoising using Adaptive Filtering	Jul 2011 – Jun 2013

TEACHING EXPERIENCE

Teaching Assistant National Institute of Technology Jalandhar Department of ECE	Aug 2015 – Jul 2020
Assistant Professor Lovely Professional University Department of ECE	Jul 2013 – Jul 2015
Teaching Assistant Lovely Professional University Department of ECE	Jan 2012 – Nov 2012
Lecturer Lovely Professional University Department of ECE	Dec 2010 – May 2011

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 (IJGMS)*, 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 <i>Mind, Brain, and Consciousness Conference (MBCC) - 2025</i> <i>Indian Institute of Technology Mandi</i>	Jun 2025
Effects of Relaxed and Stressful Mental States on the Heart Rate Variability Parameters <i>Mind, Brain, and Consciousness Conference (MBCC) - 2023</i> <i>Indian Institute of Technology Mandi</i>	Dec 2023

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

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

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

GRANTS (*PI, #Co-PI)

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

HONORS AND AWARDS

Post Doctoral Fellowship <i>Indian Institute of Technology Mandi</i>	2022 – 2025
Pre Doctoral Fellowship <i>Indian Institute of Technology Mandi</i>	2022
Doctoral Fellowship <i>National Institute of Technology Jalandhar</i>	2015 – 2022
UGC NET Qualified with JRF <i>University Grants Commission</i>	2013
GATE Qualified <i>Ministry of Education</i>	2013
University Academic Honor <i>Lovely Professional University</i>	2013
Academic Scholarship <i>Lovely Professional University</i>	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) <i>Indian Institute of Technology Mandi, Role: Workshop Organizer</i>	Dec 2023
Jury Member; Hackathon 2022 <i>Indian Institute of Technology Mandi, Role: Jury member</i>	Jul 2022
Toycathon 2021 <i>Ministry of Education, Role: Primary Evaluator</i>	Jan 2021
ATAL Online FDP on Gamification <i>National Institute of Technology Jalandhar, Role: Assisted in conduction</i>	Nov 2020
GIAN Course on Autism and Assisted Technologies <i>National Institute of Technology Jalandhar, Role: Assisted in conduction</i>	Dec 2018

MEDIA COVERAGE

Raga Bhairavi can lower stress levels: Study explores impact of Indian classical music <i>The Telegraph India, Print and online newspaper</i>	Nov 2024
Young minds dwell on e-concepts <i>The Tribune India, Print and online newspaper</i>	Nov 2017

PROFESSIONAL DEVELOPMENT

Conference (*Presented/ #Attended)

Mind, Brain, and Consciousness Conference (MBCC 2025) * <i>Indian Institute of Technology Mandi</i>	Jun 2025
CHI 2025 # <i>Yokohama, Japan</i>	Apr 2025
Mind, Brain, and Consciousness Conference (MBCC 2023) * <i>Indian Institute of Technology Mandi</i>	Dec 2023

Short Term Courses/Workshops/Webinars (Attended)

The Impact of AI on Gamification and Serious Games <i>Shri Vaishnav Vidyapeeth Vishwavidyalaya</i>	Sep 2024
Development of Simulation Game, “Project PAL” using the SECI Model and Collaborative - Learning Methods <i>Shri Vaishnav Vidyapeeth Vishwavidyalaya</i>	Jul 2024
Hands on Training and Showcasing: High Density EEG Devices <i>Indian Institute of Technology Mandi</i>	Mar 2024
Simulation Games: A Bridge between Knowledge and Behaviour <i>Shri Vaishnav Vidyapeeth Vishwavidyalaya</i>	Jan 2024
Machine-Learning advances in Human-Computer Interaction <i>Indian Institute of Technology Mandi</i>	Jul 2022
Innovation, IPR and Start-ups <i>National Institute of Technology Jalandhar</i>	Jul 2022
LaTeX for Technical Writing <i>Indian Institute of Technology Mandi</i>	June 2022
The Education Factory <i>National Institute of Technology Jalandhar</i>	Sep 2020
Machine Learning Using Python <i>National Institute of Technology Jalandhar</i>	Sep 2020
Computational Cardiac Engineering - Predictive Modelling and Innovative Sensing Systems <i>Rajasthan Technical University</i>	Sep 2020
Autism and Assisted Technologies (Gian Course) <i>National Institute of Technology Jalandhar</i>	Dec 2018

Brain Science & Technology: Tools and Techniques to understand the Human Brain <i>Indian Institute of Technology Delhi</i>	Dec 2016
Biology for Engineers <i>Indian Institute of Technology Bombay</i>	Jun 2016
Certifications	
The Octalysis Framework - Level 1 <i>The Octalysis Group</i>	Dec 2017
MOOC Courses (with certificates)	
IITM – Finland – Certificate course on Mastering VR : Fundamentals to Practice <i>Indian Institute of Technology Madras</i>	Oct 2024
DRONE01x: Drones for Agriculture: Prepare and Design Your Drone (UAV) Mission <i>Wageningen University & Research</i>	Sep 2022
Statistics in Medicine <i>Stanford University</i>	Mar 2020
Computer Science 101 <i>Stanford University</i>	Mar 2020
Introduction to CAD: Learn Fusion 360 in 90 minutes <i>Autodesk</i>	Sep 2019
Vital Signs: Understanding What the Body Is Telling Us <i>University of Pennsylvania</i>	May 2018
Advanced MATLAB for Scientific Computing <i>Stanford University</i>	Dec 2017
Introduction to Game Development <i>Michigan State University</i>	Mar 2017
Calculus One <i>The Ohio State University</i>	May 2013
Image and video processing <i>Duke University</i>	Mar 2013

PROFESSIONAL MEMBERSHIP

Association for Computing Machinery (ACM) <i>Professional Member</i>	Aug 2023 – Jul 2024
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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 <i>Role: Co-Founder, Works on technologies for autistic kids and autism.</i>	Apr 2022 – Present
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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 <i>National Institute of Technology Jalandhar</i>	2022
Gamification (ECX-488) Course E-Book, 3 Credits <i>National Institute of Technology Jalandhar</i>	2021
Classroom Gamification, Software Tool, 3 Credits <i>National Institute of Technology Jalandhar</i>	2018
Gamification (ECX-488), Course, 3 Credits <i>National Institute of Technology Jalandhar</i>	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)

2015 – 2020

<i>National Institute of Technology Jalandhar</i>	
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

2013 – 2015

<i>Lovely Professional University</i>	
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) <i>Lovely Professional University</i>	2011 – 2013
Introduction to Practical Electronics, ECE100	Fall 2012
Electrical and Electronics Workshop, ECE130	Spring 2012
Lecturer <i>Lovely Professional University</i>	2010 – 2011
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 <i>Lovely Professional University</i> 100 mt. (Gold), 200 mt. (Gold)	2015
Annual Faculty Sports Meet <i>Lovely Professional University</i> 200 mt. (Bronze), 400 mt. (Silver)	2014
Annual Faculty Sports Meet <i>Lovely Professional University</i> 100 mt. (Gold)	2011

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
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Professional Engagement: Former Head of Department

Gaganpreet Singh

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