

DR. KULBHUSHAN CHAND

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

EDUCATION

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

RESEARCH EXPERIENCE

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

TEACHING EXPERIENCE

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

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 (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, March 31). 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). A comprehensive analysis of HRV based biofeedback system for mental relaxation [In preparation].

Chand, K., Chandra, S., & Dutt, V. (2025). Analysis of heart coherence under the 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

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, <i>Futures First</i> , 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>Technology Innovation Hub, Indian Institute of Technology Mandi</i>	2022 – 2024
Pre Doctoral Fellowship <i>Technology Innovation Hub, Indian Institute of Technology Mandi</i>	2022
Doctoral Fellowship	2015 – 2022

<i>National Institute of Technology Jalandhar</i>	
UGC NET Qualified with JRF	2013
<i>University Grants Commission, India</i>	
GATE Qualified	2013
<i>Ministry of Education, India</i>	
University Academic Honor	2013
<i>Lovely Professional University</i>	
Academic Scholarship	2011 – 2013
<i>Lovely Professional University</i>	
GATE Qualified	2011
<i>Ministry of Education, India</i>	
University Academic Honor	2010
<i>Guru Nanak Dev University</i>	
Academic Scholarship	2006 – 2010
<i>Guru Nanak Dev University</i>	

ACADEMIC SERVICE / OUTREACH ACTIVITY

Mind, Brain, and Consciousness Conference (MBCC 2023)	Dec 2023
<i>Indian Institute of Technology Mandi, Role: Workshop Organizer</i>	
Jury Member; Hackathon 2022	Jul 2022
<i>Technology Innovation Hub, Indian Institute of Technology Mandi Role: Jury member</i>	
Toycathon 2021	Jan 2021
<i>Ministry of Education, India, Role: Primary Evaluator</i>	
ATAL Online FDP on Gamification	Nov 2020
<i>National Institute of Technology Jalandhar, Role: Assisted in conduction</i>	
GIAN Course on Autism and Assisted Technologies	Dec 2018
<i>National Institute of Technology Jalandhar, Role: Assisted in conduction</i>	

MEDIA COVERAGE

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

PROFESSIONAL DEVELOPMENT

Short Term Courses/Workshops/Webinars (Attended)

The Impact of AI on Gamification and Serious Games	Sep 2024
<i>Shri Vaishnav Vidyapeeth Vishwavidyalaya</i>	
Development of Simulation Game, “Project PAL” using the SECI Model and Collaborative - Learning Methods	July 2024
<i>Shri Vaishnav Vidyapeeth Vishwavidyalaya</i>	
Hands on Training and Showcasing: High Density EEG Devices	Mar 2024
<i>Technology Innovation Hub, Indian Institute of Technology Mandi</i>	
Simulation Games: A Bridge between Knowledge and Behaviour	Jan 2024
<i>Shri Vaishnav Vidyapeeth Vishwavidyalaya</i>	
Machine-Learning advances in Human-Computer Interaction	July 2022
<i>Technology Innovation Hub, Indian Institute of Technology Mandi</i>	
Innovation, IPR and Start-ups	July 2022
<i>National Institute of Technology Jalandhar</i>	
LaTeX for Technical Writing	June 2022
<i>Technology Innovation Hub, Indian Institute of Technology Mandi</i>	

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
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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

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

AD-HOC REVIEWER

Discover Psychology; <i>Springer Nature</i> (3)
iScience; <i>Cell Press</i> (4)
Heliyon; <i>Cell Press</i> (3)

SoftwareX; *Elsevier* (5)
 HardwareX; *Elsevier* (3)
 Biomedical Signal Processing and Control; *Elsevier* (4)
 Games for Health Journal; *Mary Ann Liebert, Inc.* (2)
 International Journal of Gaming and Computer-Mediated Simulations (IJGCMS); *IGI Global* (9)
 International Journal of Game-Based Learning (IJGBL); *IGI Global* (4)
 International Journal of Distance Education Technologies (IJDET); *IGI Global* (4)

INDUSTRY/STARTUP EXPERIENCE

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

SKILLS

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

Applications: NI Multisim, KiCad, Unity3D, RStudio, JASP, 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	2021
BioNES: A plug-and-play MATLAB based tool to use NES games for multimodal biofeedback	2021
MCP4251: Arduino library for MCP4251 Digital Potentiometer	2021
classroom-gamification: Tool to gamify your classroom with an online leaderboard	2018

SUBJECTS TAUGHT

Teaching Assistant (PhD Student) <i>National Institute of Technology Jalandhar</i>	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	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)	2011 – 2013
<i>Lovely Professional University</i>	
Introduction to Practical Electronics, ECE100	Fall 2012
Electrical and Electronics Workshop, ECE130	Spring 2012
Lecturer	2010 – 2011
<i>Lovely Professional University</i>	
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
<i>Lovely Professional University</i>	
<i>100 mt. (Gold), 200 mt. (Gold)</i>	
Annual Faculty Sports Meet	2014
<i>Lovely Professional University</i>	
<i>200 mt. (Bronze – 28.12 sec), 400 mt. (Silver – 1.06 min)</i>	
Annual Faculty Sports Meet	2011
<i>Lovely Professional University</i>	
<i>100 mt. (Gold)</i>	

LANGUAGES

English (Advanced)

Hindi (Native)

Punjabi (Native)

REFERENCES

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

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

Gaganpreet Singh

Senior Software Developer, Microsoft India

gagsin@microsoft.com

Professional Engagement: Former coworker