DR. KULBHUSHAN CHAND

E-mail: *kulbhushan@tih.iitmandi.ac.in* *kulbhushan.chand@gmail.com* Website: *kulbhushanchand.github.io*	Post Doctoral Fellow IIT Mandi iHub and HCI Foundation Indian Institute of Technology Mandi VPO Kamand, District Mandi, HP, India – 175075

Updated: January 17, 2025

EDUCATION

PhD   2015 – 2022
Electronics and Communication Engineering
Dr B R Ambedkar National Institute of Technology, Jalandhar, India
CGPA: 9.0

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

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

RESEARCH EXPERIENCE

Post Doctoral Fellow   Nov 2022 – Present
IIT Mandi iHub and HCI Foundation, Indian Institute of Technology Mandi
Project: Multisensory Human Computer Interaction and Biofeedback

Pre Doctoral Fellow   Jun 2022 –Nov 2022
IIT Mandi iHub and HCI Foundation, Indian Institute of Technology Mandi
Project: Multisensory Human Computer Interaction and Biofeedback

Project Team Member   Apr 2020 – Present
ISRO Space Technology Incubation Center (S-TIC),
Dr B R Ambedkar National Institute of Technology
Project - Strengthening Ridge to Valley based NRM planning under Mission Water Conservation using Geospatially enabled Serious Gaming
Role - Designing and development of serious games and gamification framework for the project.

Doctoral Researcher   Aug 2015 – Apr 2022
Department of ECE, Dr B R Ambedkar National Institute of Technology
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 to Jul 2020
Department of ECE, Dr B R Ambedkar National Institute of Technology

- Co-created and introduced Gamification course (ECX-488) for undergraduate students.
- Designed various pedagogy, tools, assignments, and exams.
- Other courses taught includes Network Analysis and Synthesis, Electronic Devices and Simulation Lab, Basic Electronics Lab.

Assistant Professor   July 2013 to July 2015
Department of ECE, Lovely Professional University
- Courses and labs taught includes Basic Electrical Engineering, Electronic Devices and Circuits, Probability and Stochastic Theory, Signal and Systems, Digital Signal Processing, Adaptive Filter Theory, Basic Electrical lab, Electronic Devices and Circuits lab, Digital Signal Processing lab.
- Developed quizzes, exams, assignments, and homework.
- Revised the syllabus an instruction plans to meet accreditation standards.
- Guided undergraduate students for their major project.
- Sports Coordinator for ECE department.

Teaching Assistant   Jan 2012 to Nov 2012
Department of ECE, Lovely Professional University
- Conducted lab Basic Electronics Lab course for undergraduate students.
- Evaluated practical, viva-voce, and written exam.

Lecturer   Dec 2010 to May 2011
Department of ECE, Lovely Professional University
- Taught Microcontroller and its Applications course to undergraduate students and conducted Microcontroller and Microprocessor lab.
- Developed exams, assignments, and homework.
- Guided undergraduate students for their major project.

PEER-REVIEWED PUBLICATIONS

Peer reviewed research papers - Journals

Chand, K., Chandra, S., & Dutt, V. (2024). Raga Bhairavi in virtual reality reduces stress-related psychophysiological markers. Scientific Reports, 14(1), 24816. https://doi.org/10.1038/s41598-024-74932-1

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). https://doi.org/10.1016/j.heliyon.2024.e32195

Chand, K., & Khosla, A. (2022). BioNES: A plug-and-play MATLAB-based tool to use NES games for multimodal biofeedback. SoftwareX, 19, 101184. https://doi.org/10.1016/j.softx.2022.101184

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. https://doi.org/10.4018/JITR.299922

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. https://doi.org/10.4018/IJGCMS.295874

Peer reviewed research papers/abstracts (*) - Conferences

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), India. https://iksmha.iitmandi.ac.in/mbcc/#proceedings *

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. https://doi.org/10.1145/3594806.3596555

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. https://doi.org/10.1145/3594806.3596579

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. https://doi.org/10.4018/978-1-5225-7706-5.ch013

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. https://doi.org/10.4018/978-1-5225-7470-5.ch006

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. https://doi.org/10.4018/978-1-5225-7004-2.ch012

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. https://doi.org/10.4018/978-1-5225-7253-4.ch007

Manuscripts in preparation or Review

Chand, K., Khosla, A., & Dutt, V. (2023). A framework to use Nintendo Entertainment System games for biofeedback [Manuscript under review].

CONFERENCE PRESENTATIONS

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

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

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

HONORS AND AWARDS

Post Doctoral Fellowship, *IIT Mandi iHub and HCI Foundation*	2022-2024
Pre Doctoral Fellowship, *IIT Mandi iHub and HCI Foundation*	2022
Doctoral Fellowship, *Dr B R Ambedkar National Institute of Technology*	2015-2022
UGC NET Qualified with JRF, *University Grants Commission, India*	2013
GATE Qualified	2013
University Academic Honor, *Lovely Professional University, India*	2013
Academic Scholarship, *Lovely Professional University, India*	2011-2013
GATE Qualified	2011
University Academic Honor, *Guru Nanak Dev University, India*	2010
Academic Scholarship, *Guru Nanak Dev University, India*	2006-2010

PROFESSIONAL DEVELOPMENT

Short Term Courses/Workshops/Webinars (Attended)

The Impact of AI on Gamification and Serious Games *Shri Vaishnav Vidyapeeth Vishwavidyalaya*	Sep 2024
Development of Simulation Game, "Project PAL" using the SECI Model and Collaborative Learning Methods *Shri Vaishnav Vidyapeeth Vishwavidyalaya*	July 2024
Hands on Training and Showcasing: High Density EEG Devices *IIT Mandi iHub and HCI Foundation*	Mar 2024
Simulation Games: A Bridge between Knowledge and Behaviour *Shri Vaishnav Vidyapeeth Vishwavidyalaya*	Jan 2024
Machine-Learning advances in Human-Computer Interaction *IIT Mandi iHub and HCI Foundation*	July 2022
Innovation, IPR and Start-ups *Dr B R Ambedkar National Institute of Technology*	July 2022
LaTeX for Technical Writing *IIT Mandi iHub and HCI Foundation*	June 2022
The Education Factory, *Dr B R Ambedkar National Institute of Technology*	Sep 2020
Machine Learning Using Python, *Dr B R Ambedkar National Institute of Technology*	Sep 2020
Computational Cardiac Engineering - Predictive Modelling and Innovative Sensing Systems, *Rajasthan Technical University*	Sep 2020
Autism and Assisted Technologies (Gian Course) *Dr B R Ambedkar National Institute of Technology*	Dec 2018
Brain Science & Technology: Tools and Techniques to understand the Human Brain *Indian Institute of Technology Delhi*	Dec 2016
Biology for Engineers, *Indian Institute of Technology Bombay*	Jun 2016

Certifications

The Octalysis Framework - Level 1, *The Octalysis Group*	Dec 2017

MOOC Courses (with certificates)

IITM – Finland – Certificate course on Mastering VR : Fundamentals to Practice *Indian Institute of Technology Madras*	Oct 2024
DRONE01x: Drones for Agriculture: Prepare and Design Your Drone (UAV) Mission *Wageningen University & Research*	Sep 2022
Statistics in Medicine, *Stanford University*	Mar 2020
Computer Science 101, *Stanford University*	Mar 2020

Introduction to CAD: Learn Fusion 360 in 90 minutes, *Autodesk*	Sep 2019
Vital Signs: Understanding What the Body Is Telling Us, *University of Pennsylvania*	May 2018
Advanced MATLAB for Scientific Computing, *Stanford University*	Dec 2017
Introduction to Game Development, *Michigan State University*	Mar 2017
Calculus One, *The Ohio State University*	May 2013
Image and video processing, *Duke University*	Mar 2013

ACADEMIC SERVICE

Workshop Organizer: Mind, Brain, and Consciousness Conference (MBCC) – 2023 *Indian Institute of Technology Mandi*	Dec 2023
Jury Member; Hackathon 2022; *IIT Mandi iHub and HCI Foundation*	Jul 2022
Evaluator; Toycathon 2021; *AICTE*	Jan 2021

PROFESSIONAL MEMBERSHIP

Association for Computing Machinery (ACM); *Professional Member*	Aug 2023

EDITORIAL REVIEW BOARD

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

AD-HOC REVIEWER

Discover Psychology; *Springer Nature* (3)
iScience; *Cell Press* (4)
Heliyon; *Cell Press* (2)
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

Co-Founder; T4A Labs Pvt Ltd.	Apr 2022 – Present

Incubated in NITJ Technology Business Incubator. This startup works on autistic kids and autism and is based out of Jalandhar.

SKILLS

Programming:	Assembly, C, C++, R, Lua, MATLAB, Python, Visual Basic
Applications:	NI Multisim, Autodesk Fusion 360, KiCad, Unity3D, RStudio, JASP, Pure Data (Pd)
Operating Systems:	Windows, Ubuntu
Others:	Octalysis-Level1 Expert

PROJECTS

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

Arduino Workshop for Kids E-Book, (E-Content) *https://github.com/kulbhushanchand/ArduinoWorkshopForKids*	2022

Dr B R Ambedkar National Institute of Technology

Gamification (ECX-488) Course E-Book, 3 Credits, (E-Content) 2021
https://github.com/kulbhushanchand/GamificationCourseBook
Dr B R Ambedkar National Institute of Technology

Classroom Gamification, Software Tool, 3 Credits, (Innovative Pedagogy) 2018
https://github.com/kulbhushanchand/classroom-gamification
Dr B R Ambedkar National Institute of Technology

Gamification (ECX-488), Course, 3 Credits (New course and Curricula) 2016
https://departments.nitj.ac.in/dept/ece/Syllabus
Dr B R Ambedkar National Institute of Technology

Software Projects

AfDaq: A plug and play MATLAB based tool for biofeedback and arduino based instruments

BioNES: A plug-and-play MATLAB based tool to use NES games for multimodal biofeedback

MCP4251: Arduino library for MCP4251 Digital Potentiometer

classroom-gamification: Tool to gamify your classroom with an online leaderboard

Research Projects

AfDaq: An Open-source MATLAB based Real-time Multi-channel Data Acquisition Tool for Biofeedback and Arduino based Instruments
https://doi.org/10.17605/OSF.IO/VCTJM
Dr B R Ambedkar National Institute of Technology

Efficacy of a multimodal biofeedback system for mental relaxation using NES games
https://doi.org/10.17605/OSF.IO/Q5EZ3
Dr B R Ambedkar National Institute of Technology

SPORTS ACTIVITIES

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

200 mt. (Bronze – 28.12 sec), 400 mt. (Silver – 1.06 min) 2014
Annual Faculty Sports Meet, *Lovely Professional University*

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

LANGUAGES

English: Advanced
Hindi: Native
Punjabi: Native

PERSONAL

Birth Year: 1988
Permanent Residence: Punjab, India
Current Residence: IIT Mandi, Himachal Pradesh, India

REFERENCES

Prof. Arun Khosla	**Prof. Laxmidhar Behera**
Professor,	Director,
Department of ECE,	Indian Institute of Technology Mandi
Dr B R Ambedkar National Institute of Technology	Mandi, Himachal Pradesh, India – 175075
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Professor,
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Gaganpreet Singh
Senior Software Developer
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Email: gagsin@microsoft.com