

# DR. KULBHUSHAN CHAND

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Google Scholar	<a href="https://scholar.google.com/citations?user=s9_oY5MAAAAJ&amp;hl">s9_oY5MAAAAJ&amp;hl</a>	
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ResearchGate	<a href="https://www.researchgate.net/profile/Kulbhushan-Chand">Kulbhushan-Chand</a>	
GitHub	<a href="https://github.com/kulbhushanchand">kulbhushanchand</a>	
OSF	<a href="https://osf.io/wxqdj">wxqdj</a>	

Updated: December 12, 2024

## EDUCATION

<b>PhD</b> Electronics and Communication Engineering <i>Dr B R Ambedkar National Institute of Technology, Jalandhar, India</i> CGPA: 9.0	2015 – 2022
<b>MTech</b> Electronics and Communication Engineering <i>Lovely professional University, Phagwara, India</i> Graduated with Hons. and University Topper CGPA: 9.12	2011 – 2013
<b>BTech</b> Electronics and Communication Engineering <i>Guru Nanak Dev University, Regional Campus, Jalandhar, India</i> Graduated with Hons. %Marks: 78.05	2006 – 2010

## RESEARCH EXPERIENCE

<b>Post Doctoral Fellow</b> <i>IIT Mandi iHub and HCI Foundation, Indian Institute of Technology Mandi</i> Project: Multisensory Human Computer Interaction and Biofeedback	Dec 2022 – Present
<b>Pre Doctoral Fellow</b> <i>IIT Mandi iHub and HCI Foundation, Indian Institute of Technology Mandi</i> Project: Multisensory Human Computer Interaction and Biofeedback	Jun 2022 – Nov 2022
<b>Project Team Member</b> ISRO Space Technology Incubation Center (S-TIC), <i>Dr B R Ambedkar National Institute of Technology</i> 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.	Apr 2020 – Present
<b>Doctoral Researcher</b> <i>Department of ECE, Dr B R Ambedkar National Institute of Technology</i> Dissertation: Low cost multimodal biofeedback for mental relaxation Advisor: Prof. Arun Khosla	Aug 2015 – Apr 2022
<b>MTech Researcher</b> <i>Lovely professional University</i>	July 2011 – June 2013

## UNIVERSITY TEACHING EXPERIENCE

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### 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 and 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

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### 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 Psychophysiological 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**

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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* Oct 2023

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

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Human Motivation and Engagement Analysis using Octalysis Gamification Framework \*  
5<sup>th</sup> Winter School on Cognitive Modeling - 2023  
*Indian Institute of Technology Mandi* Oct 2023

Octalysis Gamification Framework  
Guest Lecture for undergraduate course Gamification (ECO-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

## HONORS AND AWARDS

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

## PROFESSIONAL DEVELOPMENT

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### 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>	July 2024
Hands on Training and Showcasing: High Density EEG Devices <i>IIT Mandi iHub and HCI Foundation</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>IIT Mandi iHub and HCI Foundation</i>	July 2022
Innovation, IPR and Start-ups <i>Dr B R Ambedkar National Institute of Technology</i>	July 2022
LaTeX for Technical Writing <i>IIT Mandi iHub and HCI Foundation</i>	June 2022
The Education Factory, <i>Dr B R Ambedkar National Institute of Technology</i>	Sep 2020
Machine Learning Using Python, <i>Dr B R Ambedkar National Institute of Technology</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>Dr B R Ambedkar National Institute of Technology</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)

DRONE01x: Drones for Agriculture: Prepare and Design Your Drone (UAV) Mission <i>Wageningen University &amp; 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

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#### ACADEMIC SERVICE

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

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#### PROFESSIONAL MEMBERSHIP

Association for Computing Machinery (ACM); <i>Professional Member</i>	Aug 2023
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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>

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#### AD-HOC REVIEWER

International Journal of Gaming and Computer-Mediated Simulations (IJGCMS); <i>IGI Global</i> (9)
International Journal of Game-Based Learning (IJGBL); <i>IGI Global</i> (4)
SoftwareX; <i>Elsevier</i> (5)
Biomedical Signal Processing and Control; <i>Elsevier</i> (4)
Discover Psychology; <i>Springer Nature</i> (3)
HardwareX; <i>Elsevier</i> (3)
iScience; <i>Cell Press</i> (3)
Games for Health Journal; <i>Mary Ann Liebert, Inc.</i> (2)
International Journal of Distance Education Technologies (IJDET); <i>IGI Global</i> (3)

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#### 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.	

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#### SKILLS

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

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#### PROJECTS

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

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

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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

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**English:** Advanced

**Hindi:** Native

**Punjabi:** Native

### PERSONAL

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**Birth Year:** 1988

**Permanent Residence:** Hoshiarpur, Punjab, India

**Current Residence:** IIT Mandi, Himachal Pradesh, India

### REFERENCES

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**Prof. Arun Khosla**  
Professor,  
Department of ECE,  
Dr B R Ambedkar National Institute of Technology

**Prof. Laxmidhar Behera**  
Director,  
Indian Institute of Technology Mandi  
Mandi, Himachal Pradesh, India – 175075

Jalandhar, India – 144011

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