



Program Report
Summer School on Evolutionary Algorithms and Machine Learning
(EvoML-2025), 16th June 2025 to 20th June 2025
(Self-Sponsored)

Summer School on Evolutionary Algorithms and Machine Learning (EvoML-2025)

Organized by: Department of Mathematics and Computing, Dr B R Ambedkar NIT Jalandhar

Dates: 16th – 20th June 2025

The *Summer School on Evolutionary Algorithms and Machine Learning (EvoML-2025)* was conducted by the Department of Mathematics and Computing, Dr B R Ambedkar National Institute of Technology, Jalandhar, from 16th to 20th June 2025. This week-long academic event attracted participation from over 120 scholars, academicians, and students from across India and abroad. Designed to bridge theoretical foundations and practical implementation, the summer school offered a comprehensive exploration of cutting-edge topics in evolutionary algorithms (EAs) and machine learning (ML), delivered through expert lectures, laboratory sessions, and a hands-on competition.

The programme commenced with an inaugural session that introduced the objectives and scope of EvoML-2025. This was followed by a series of lectures delivered by distinguished experts in the field. **Prof. Kusum Deep** from IIT Roorkee introduced participants to the design and real-world applications of evolutionary algorithms. **Dr. Hemant Kumar Singh** from the University of New South Wales, Australia, offered insights into transfer evolutionary optimization techniques supported by Gaussian process surrogates. From the National University of Singapore, **Dr. Anupam Trivedi** and **Dr. Dikshit Chauhan** contributed advanced perspectives on hybrid optimization frameworks and evolutionary computation in AI.

Notably, **Prof. Lipo Wang** from Nanyang Technological University, Singapore, brought in a neuro-computational view on intelligent systems, while **Dr. Efrén Mezura-Montes** of the University of Veracruz, Mexico, highlighted constraint handling in nature-inspired algorithms. **Prof. Sanjay Singh**, Senior Principal Scientist at CSIR-CEERI, reflected on the synergy between AI methods and sensor systems. Talks by **Dr. Donghwi Jung** from Korea University on harmony search, **Dr. Indu Bala** from the University of Adelaide, and **Dr. Bapi Dutta** from the University of Jaén, Spain, enriched the discussions with global perspectives on evolutionary optimisation in engineering domains.

Contributions from Indian institutions were equally significant. **Dr. Anupam Yadav** (NIT Jalandhar) discussed artificial electric field algorithms and their relevance to machine learning, while **Dr. Shubham Gupta** (MNNIT Allahabad), **Dr. Harish Sharma** (RTU), **Dr. Kedar Nath Das** (NIT Silchar), and **Dr. JC Bansal** (South Asian University) shared insights into various evolutionary strategies and their computational implementations. **Dr. Manoj Thakur** (IIT Mandi), **Dr. Abhishek Gupta** (IIT Goa), and **Dr. Scindhiya Laxmi** (IIT-ISM Dhanbad) also made valuable contributions by discussing both foundational and emerging approaches in intelligent optimisation.

Beyond the lecture sessions, the event featured structured laboratory sessions where participants engaged with tools and platforms relevant to the implementation of EAs and ML techniques. These sessions facilitated hands-on exposure to

problem-solving using benchmark functions and real-world datasets. A dedicated competition was organised to test the participants' understanding and creative application of the learned methodologies. In addition, **Mr. Aninda Bose**, Executive Editor at Springer Nature, conducted a special session on scholarly publishing, research ethics, and scientific communication, which was well-received by the participants.

The feedback collected from the participants indicated a high level of satisfaction. A significant proportion of attendees rated the programme between 7 and 10 on a 10-point scale, with many commending the informativeness of the topics and the relevance of the speakers. Comments such as “very informative,” “overall session was good,” and “good selection of speakers” reflect the general sentiment. While most participants expressed a strong interest in attending future editions of the summer school, one respondent suggested improving variety and depth in future iterations, highlighting the constructive spirit of the feedback. The laboratory sessions were appreciated for their hands-on utility, particularly in exposing participants to practical tools and real-time problem-solving environments. The inclusion of a competitive session allowed participants to implement their learning in an applied setting, adding a dynamic dimension to the training.

Overall, EvoML-2025 achieved its aim of enriching participants' knowledge and research capabilities in the fields of evolutionary algorithms and machine learning. The programme successfully facilitated academic interaction, skill development, and exposure to current global research trends. The Department of Mathematics and Computing expresses sincere gratitude to all speakers, participants, and organising members whose collective efforts made this initiative a resounding success.







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A world with constraints.
Some experiences in Evolutionary
Constrained Optimization

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