

## Special Seminar Report

### *AI as a Unifying Force – Transformative Convergence across Disciplines*

**Date:** April 12, 2025

**Venue:** Science Faculty Hall

**Organized by:** Dayalbagh Educational Institute (DEI)

A captivating and intellectually enriching seminar was organized at Dayalbagh Educational Institute on April 12, 2025, as part of the university's Special Seminar Series. Designed as a popular lecture accessible across academic disciplines, the event drew an enthusiastic offline audience of about 55 participants along with a substantial online viewership from diverse departments including science, engineering, humanities, and education.

The lecture titled **"AI as a Unifying Force: Transformative Convergence across Disciplines"** was delivered by **Prof. Sandeep Paul**, an eminent scholar from the Neural Networks and Robotics Lab, Department of Physics and Computer Science, DEI. His thought-provoking presentation traversed the dynamic evolution of Artificial Intelligence (AI), illustrating how it is revolutionizing not only technological domains but also redefining knowledge, creativity, and collaboration across seemingly unrelated fields.



Prof. Paul began by posing a powerful metaphor: a neuroscientist, artist, physicist, and historian walking into a room—united not by their discipline but by a neural network. This set the stage for a journey into how AI is no longer confined to laboratories or code; it now composes music, interprets ancient languages, predicts protein structures, and even inspires philosophical inquiry.

Through an interdisciplinary lens, the speaker elaborated on AI as a translation layer across domains, enabling the transformation of vision into language, and biological structures into computational models. The presentation spotlighted the 2024 Nobel Prizes in Physics and Chemistry, awarded to researchers whose work in AI has drastically impacted protein science and neural networks—underscoring AI's growing role in solving grand scientific challenges.

Prof. Paul then transitioned into the evolution of neural networks, beginning from their biological inspiration to modern deep learning architectures. He also delved into advanced AI concepts such as the Hopfield network, Hebbian learning, and Transformer models, explaining their significance in powering today's cutting-edge generative AI systems like ChatGPT, DALL-E, and AlphaFold. By breaking down these complex ideas, he illustrated how these foundational models

contribute to the way machines recognize patterns, generate creative outputs, and solve complex problems—bridging the gap between theoretical concepts and real-world applications.

A compelling section of the seminar was devoted to AI in education. Highlighting a case study from Sweden, the speaker discussed how the over-digitalization of learning tools initially led to setbacks such as reduced reading comprehension. The subsequent policy reversal emphasized the importance of a hybrid educational model—balancing digital tools with traditional methods and teacher oversight.

A unique dimension introduced by Prof. Paul was the integration of “*Sanskaras*”—a concept rooted in Indian philosophy referring to ethical and cultural values—into AI models. He proposed that just as humans carry past impressions influencing behavior, AI models too could be trained on value-laden datasets to foster ethical decision-making and higher consciousness.



The discussion extended to the limits of current AI, distinguishing between narrow AI and the aspirational realm of Artificial General Intelligence (AGI). The speaker also introduced a range of thought experiments such as the Turing Test, Chinese Room Argument, and emerging benchmarks like the Lovelace Test, Abstraction and Reasoning Corpus and Moral Machine & Ethical Reasoning Benchmarks. Each of these were used to provoke critical reflection on what it truly means for machines to “think.”

In a compelling conclusion, Prof. Paul stressed the importance of understanding AI as a tool, akin to how a chef understands ingredients, or a photographer understands light. He urged participants to go beyond usage and develop data literacy, ethical reasoning, and creative problem-solving—skills that complement AI rather than compete with it.

The seminar ended with an engaging Q&A session. Participants raised insightful questions on AI’s societal impact, ethical use, and its role in reshaping disciplines. Prof. Paul’s thoughtful responses left the audience both informed and inspired.

### **Outcome and Impact**

The seminar was successful in achieving its objective of demystifying AI for a multidisciplinary audience while showcasing its transformative potential. It fostered awareness, critical inquiry, and a sense of shared responsibility in harnessing AI for the common good. Above all, the lecture emphasized that while AI may be a marvel of our age, its greatest strength lies in its ability to amplify human creativity, ethics, and collaboration.

