



Workshop on Machine Learning and Economics: Theory, Applications and Implications

Convener: Dr Debdatta Saha (Associate Professor, Faculty of Economics, South Asian University)

Co-convener: Dr Reshma Rastogi (Associate Professor, Faculty of Mathematics and Computer Science, South Asian University)

Venue: South Asian University, New Delhi and Online (Hybrid Mode)

Concept Note

Machine Learning (ML), along with Artificial Intelligence (AI), have created many possibilities with data analysis in economics in recent times. The proliferation of digitisation and machine learning (and artificial intelligence) have given rise to newer business models and forms of organisation. At the same time, it has raised a number of public policy concerns, such as the antitrust treatment of firm behaviour in technology-driven markets as well as the impact on labour markets. The aim of this workshop is to introduce participants to the interface between ML and economics through a detailed exploration of three aspects: (1) the mathematical theory of ML algorithms such as decision trees, XGBoost, neural networks, deep learning models, (2) demonstration of ML algorithms using real economic data and (3) the implications of such applications of ML algorithms for some specific economic issues. The workshop should benefit economics scholars, particularly early phase doctoral and advanced graduated students as well as policymakers and practitioners. Certificate of participation shall be given at the end of the workshop. Attendees shall be given access to lecture material upon registration.

The first day of the workshop is dedicated to lectures on mathematics of ML algorithms and economic applications of these applications, with demonstration of some of these techniques using Python. The second day of the workshop shall not only take this discussion forward, with specific applications in economics, but also ensure active participation of practitioners and regulators through two panel discussions. The panels shall deliberate on issues related to digital ecosystems and markets, which apply techniques using AI/ML and big data.

The structure of the workshop is designed as in the following sessions:

Day 1 (4th October 2024)

Workshop Registration (9:30-10:00)

Inaugural Session:

-Introduction to the Workshop (10:00-10:10)

-Introduction of Resource Persons (10:10-10:20)

-Inaugural Address (10:20-10:35) Prof K K Aggarwal, President, South Asian University

Session 1 (10:35 to 11:35) Introductory Lecture on Economics and Machine Learning (ML) (with an application of decision trees and XGBoost algorithms)

Instructors:

Dr Debdatta Saha, Associate Professor, Faculty of Economics, South Asian University

Dr Jessica Thacker, Analyst, Citicorp Services Private Limited, Gurugram



Tea Break (11:35 to 11:50)

Session 2 (11:50 to 13:00) Mathematics of ML (Introduction to the mathematics of ML relevant for economic problems)

Instructor:

Dr Reshma Rastogi, Associate Professor, Faculty of Mathematics and Computer Science, South Asian University

Lunch Break (13:00-14:00)

Session 3 (14:00 to 16:00) Lab Session: Live Demonstration of ML Algorithms (Neural Networks using Python)

Instructor:

Dr. Reshma Rastogi, Associate Professor, Faculty of Mathematics and Computer Science, South Asian University

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Day 2 (5th October 2024)

Workshop Registration (10:00-10:30 am)*

Session 1 (10:30 to 11:30) Lecture on Selected Topics in Algorithms, Data Science and Economics

Instructor:

Dr Dipankar Das, Assistant Professor, Goa Institute of Management

Tea Break (11:30 to 11:45)

Session 2 (11:45 to 13:00) **Panel Discussion I: Value Creation in Digital Ecosystems**

This panel shall deliberate on specific aspects of value creation in digital ecosystems. The purpose of this session is to understand the process, key elements and future trajectory in value creation by firms in these ecosystems.

Panellists:

- 1) Ms Poulomi Bhattacharya, Chief Executive Officer, SilverGenie Private Limited
- 2) Ms Garima Rathore, Director, Government Affairs and Public Policy, Microsoft
- 3) Mr Vinayak Godse, Chief Executive Officer, Digital Security Council of India

Moderator: Dr Debdatta Saha, Faculty of Economics, South Asian University

Lunch Break (13:00 to 14:00)



Session 3 (14:00 to 16:30) Panel Discussion II: Impact of Algorithms and Digital Platforms on Society (with special focus on antitrust, innovation and labour markets)

Digital platforms have emerged as the dominant form of business organisation in the digital economy. They pose unique regulatory and policy challenges. While many of these challenges are not unique to digital markets individually, their incidence in one market certainly is. The meteoric rise of Artificial Intelligence (AI) models in the last few years has also forced policymakers to think about how they want to shape the development of future AI models. Some of these concerns are common to platform markets; some are not. This panel aims to summarise some of these concerns for the audience and foster an engaging conversation between economists, policymakers, and industry representatives about the Indian context.

Panellists:

- 1) Prof Aditya Bhattacharjea, Senior Professor (Retired), Delhi School of Economics
- 2) Ms Dinoo Muthappa, Partner, AZB & Partners
- 3) Representative from CCI with expertise on regulation of digital platform markets (yet to be confirmed)**

Moderator: Prof Nishant Chadha, Director, Policy and Research, EE, Indian School of Business

Vote of Thanks (16:30-16:45)

End of Workshop

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* Registration window shall be open on both days. Some participants who want to participate only on a single day of the workshop shall be allowed to do so. The participation certificate shall mention clearly the dates of attendance by the participants.

** We have received email confirmation from all other panellists and participants in the workshop. Confirmation of CCI official is not confirmed yet.

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