

# Computational Economics can help achieve better economic

**This can offer a better understanding of economic disruptions caused by the pandemic and the Ukraine-Russia war**

Sonal.Srivastava @timesgroup.com

**A**rtificial Intelligence (AI) and Machine Learning (ML), through Computational Economics, are helping researchers sift through the data to understand it better and build theories of Economics that can be useful to consumers, economists and governments for better outcomes.

Computational Economics, at a nascent stage in India, is a trans-disciplinary field that brings Economics, AI and ML together to create computational econometrics and statistics, and modelling of dynamic macroeconomic systems. It helps in building tools for designing automated internet markets, and pedagogical tools for teaching-learning. The field of Computational Economics is at the intersection of Economics, Computer Science and Business Administration.

## Understanding data

"Economics has always been dependent on data, which was not as extensive earlier as it is now. Economists based their decisions on whatever data they could collect. Today, we collect more data on consumer behaviour that needs to be interpreted. AI and ML help understand the economic realities, consumer behaviour, and reactions of consumers to circumstances," says Neeraj Jain, head, School of Artificial Intelligence and



Data Science, IIT Jodhpur.

"It's a trans-disciplinary emerging field, so a solid understanding of AI and ML and basic knowledge of Economics is required to plug data. We are trying to bring people from different fields together. Students of Economics have a background of Statistics and Mathematics, they can work with the students of Computer Science Engineering to create something new," adds Jain.

## Key research areas

IIT Jodhpur established The Centre for

Mathematical and Computational Economics (CMCE) in 2020 as a specialised unit of the multidisciplinary School of Artificial Intelligence and Data Science. It is one of the first such academic units in India to focus on AI applications to Economics and economic theories. Key research areas at CMCE include Game Theory, Mechanism Design, Market Design and Auctions, Social Choice, Decision Theory, Network Economics, Experimental Economics, and applying AI and ML techniques to resolve economic problems.

Dweepobotee Brahma, assistant professor, School of Artificial Intelligence and Data Science, IIT Jodhpur, received a scholarship worth \$20,000 from Google India for her ongoing research project, recently. Economics can help in creating better AI, she says.

"Economics has a foundational theory of consumer behaviour that helps understand how consumers make decisions. So, when these theories are plugged into algorithms, they create better algorithms, which will be profitable for the companies," says Brahma, explaining that the intersection of AI and Economics can definitely be examined from various angles.

## AI eliminates biases

Economics provides decisions on production, distribution, exchange, consumption, saving, and investment questions. "These decisions are made to optimise complex and abstract measures involving extensive and diverse da-

ta. Currently, these decisions are made by professionals based on their intuition and experience. AI tools can sieve through any amount of large data and identify patterns to provide optimal answers to all the questions in Economics. Moreover, if applied correctly, AI has the potential to eliminate biases that humans have," says Mohammed Mansoor, assistant professor, GITAM School of Business, Bengaluru.

## Latest tech

Older statistical models were not able to capture the complexity of data, which increased the challenge to understand its patterns. Computational Economics, on the other hand, provides modern technology tools to examine data and use it effectively. "AI is based on the heuristics model. Economists were using auto-regressive models to forecast the GDP of a country. These may not be able to help in understanding the complexities of the data. For example, statistical

models may not be able to capture the complexity of data arising out of disruptions caused by the Ukraine-Russia war. Similarly, the Covid-19 pandemic is like a 'noise' in the data, understanding this noise through statistical models will be difficult," says Akhter Mohiuddin Rather, associate professor, Artificial Intelligence and Analytics, Great Lakes Institute of Management, Gurgaon.

AI can also help in predicting the market's behaviour. "Deep Learning algorithms can help in predicting data that is appearing as a series, such as the stock price. If you want to analyse the impact of the Ukraine Russia war on the economy of a country, an AI system can interpret the text and predict fuel prices and inflation. Multimodal data can be fed into an AI framework which then helps predict the economic indicators of the country," explains Gopalakrishnan EA, associate professor, Amrita Vishwa Vidyapeetham, Coimbatore Campus, explaining the role Computational Economics plays in predictive analysis.

**NEW COURSE**