U H ACHARYA LECTURE SERIES

26 - 30 October 2023

SQC & OR Unit

Indian Statistical Institute, Bangalore

Organized by:
SQC & OR Unit, Indian Statistical Institute, Bangalore - 560 059, INDIA

Phone : +91-80-2698 5402 Mobile: +91 94487 04182 Fax : +91-80-2848 4910

Web : http://www.isibang.ac.in
e - mail : boby@isibang.ac.in & moutushi@isibang.ac.in

U H Acharya Lecture Series

Title: **Application of Envy Free Pricing in Networks**

Speaker: **Aaditya Bhardwaj**
Lancaster University, UK

Date: 26 October 2023

Time: 7:00 PM to 8:00 PM IST

Abstract:
Envy-free pricing is a concept rooted in economics and game theory, with diverse applications in fields like Auction Theory, Retail Pricing Strategy, Fair Division of Inheritance, Sports Scheduling, and Resource Allocation. Its primary focus is on distributing goods or resources among multiple individuals in a way that avoids generating envy or resentment. The original envy-free pricing problem involves consumers with budgets and an interest in a set of products with unlimited supply. This problem has been further refined by considering factors like consumer decision-making, budget allocation for preferred products, supply-demand constraints, and product preferences. In this presentation, the speaker will provide a comprehensive overview of the Envy-Free Pricing Problem, highlight key research findings, and demonstrate a practical application in Retail Fuel Forecourt pricing.

U H Acharya Lecture Series

Title: **Fully Distributed Algorithms for Densely Coupled Optimization Problems in Sparse Optimization and Transportation Applications**

Speaker: **Eswar Kumar H K**

Walmart Global Tech, New Jersey, USA

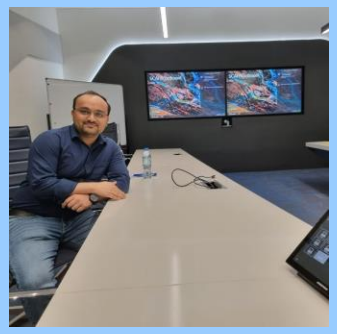
Date: 27 October 2023

Time: 7:00 PM to 8:00 PM IST

Abstract:

The study explores the advancement of fully distributed algorithms designed to address densely coupled optimization problems in two key domains: sparse optimization problems utilizing column partition-based methods and their practical application within transportation scenarios. For column partition based sparse optimization problems, two-stage, fully distributed algorithms are developed that rely on solution properties, exact regularization, and dual formulation of the problems. For transportation applications, fully distributed algorithms are developed for model predictive control (MPC) based connected and autonomous vehicle (CAV) platooning control under both linear and nonlinear vehicle dynamics. Decomposition techniques and operator splitting methods are used to solve the optimization problems in a fully distributed manner.

U H Acharya Lecture Series



Title: **Epicasting: Forecasting Epidemics with EWNet**

Speaker: **Tanujit Chakraborty**

Sorbonne University, Abu Dhabi

Date: 28 October 2023

Time: 7:00 PM to 8:00 PM IST

Abstract:

Forecasting time series data represents an emerging field of research in data science that has vast applications for the early prediction of epidemics. Numerous statistical and machine learning methods have been proposed for generating high-quality and reliable forecasts. The speaker will present a newly developed method, called Ensemble Wavelet Neural Network (EWNet), for epidemic forecasting (epicasting).

U H Acharya Lecture Series

Title: **Advancing Reward Design and Alignment in Reinforcement Learning through Human Feedback: The Success Story of ChatGPT**

Speaker: **Souradip Chakraborty**

University of Maryland, USA

Date: 29 October 2023

Time: 7:00 PM to 8:00 PM IST

Abstract:

The remarkable success of ChatGPT owes much to Reinforcement Learning from Human Feedback (RLHF), a pivotal technique that has substantially elevated the performance of language models. The alignment of RLHF with human feedback is of paramount importance in today's landscape, especially concerning the domains of safety, security, and trustworthy AI. RLHF offers an efficient framework for aligning AI systems with human preferences alone. During this presentation, I will provide an overview of the RLHF framework, addressing reward design challenges, and outlining the forthcoming steps in this field."

Indian Statistical Institute

U H Acharya Lecture Series

Title: **Deep neural networks for large-scale complex spatial and spatio-temporal processes**

Speaker: **Pratilk Nag**
King Abdullah University of Science and Technology, Saudi Arabia

Date: 30 October 2023

Time: 7:00 PM to 8:00 PM IST

Abstract:
The demand for characterizing and forecasting environmental phenomena, such as air quality, has increased in recent years, leading to the development of modeling frameworks to address the complex dynamics of nonstationary spatial and spatio-temporal processes. The first modeling framework presented uses a distribution-free spatio-temporal architecture that combines interpolation with a dependent deep neural network and Convolutional Long-Short Term Memory network for forecasting. The framework also provides quantile-based prediction intervals for uncertainty quantification.The second modeling framework explores an alternative likelihood-based approach using invertible neural networks, specifically Normalizing Flows, to transform spatial and temporal spaces and address nonstationarity. Preliminary results from this approach will be discussed.

U H Acharya Lecture Series

Registration Fee

There is no registration fee for this program. The admission is free

Seats are limited. The participants will be selected on the first-come-first-serve basis

Registration Form link

https://forms.gle/5j3nkFaPyTApy59w5

Important Dates

Start date: 26 October 2023

End date: 30 October 2023

Contact: Program Directors: ALS,
SQC & OR Unit, Indian Statistical Institute,
8th Mile, Mysore Road, Bangalore –560059, INDIA
Fax: +91-80-2848 4910
Phone: + 91-80-2698 5402
Mobile: +91 94487 04182
email: boby@isibang.ac.in & moutushi @isibang.ac.in

Indian Statistical Institute

1. Indian Statistical Institute is a unique institution devoted to the research, teaching and application of statistics, natural sciences and social sciences
2. It is declared by an Act of Parliament as an Institute of National Importance.
3. Over the years, the Institute has grown as a multi-disciplinary organization.
4. It functions as a University empowered to award degrees up to Ph.D.; as a Corporation in undertaking large scale projects; as a Firm of Consultants to industries to improve Quality, Reliability & Efficiency and as a Meeting place of Scientists, Economists & Literary figures from all parts of the world.

Role & Function of SQC & OR Division

1. The pioneer and leader in blending statistical theory with practice and institutionalizing the continuous improvement process into a sustainable system.
2. To strengthen the national economy through a continual search for excellence in Quality.
3. To disseminate the basic concepts and techniques for Quality Improvement by organizing Training programs, Workshops and In-house programs.
4. To develop highly skilled professionals capable of self-actualization.
5. To help industries in their efforts to cope up with the growing challenge of global competition through implementation of quality systems based on ISO-9000 series, ISO-14000, QS-9000 standards, Six Sigma & World Class Manufacturing.
6. To continually develop and improve methodologies through applied research efforts to attain International Standards in services provided.