MANIPAL ACADEMY of HIGHER EDUCATION
(Deemed to be University under Section 3 of the UGC Act, 1956)

CARAMS

A TWO-WEEK WORKSHOP ON

ALGORITHMS FOR COOPERATIVE TU GAMES USING MATRICES AND GRAPHS

December 20 – 31, 2021

*CARAMS, MAHE will be organizing a two-week workshop, carrying a credit of 2 points, on the topic '**Algorithms for Cooperative TU Games using Matrices and Graphs**' during **December 20-31, 2021**. This is in continuation of Prof. T. E. S. Raghavan's effort of organizing 'Gurukulam' for the last few years. The course will be organized in in-person/hybrid format depending on the prevailing COVID situation. For the same reason, the dates also remain to be flexible.*

Resource Personnel

Prof. T. E. S. Raghavan
University of Illinois at Chicago

Prof. Ravindra B. Bapat
Indian Statistical Institute, Delhi

Objective of the workshop: *To provide an advanced input on integrating the following:*

a) *Matrices associated with graphs such as Incidence, Adjacency and Laplacian matrices, Distance matrix of a tree and its generalizations, Resistance distance, Proof of the sensitivity conjecture, and the Algorithmic aspects of Cooperative Game Theory which involve many basic combinatorial developments like: Max-flow min-cut, Longest paths ending in a graph, Edmond's maximum matching in a general graph.*

b) *Completely mixed games and Perron Frobenius Theorem, Matrix games with payoff M that guarantee the solvability of the associated LCP constructively via the Lemke Howson algorithm, Totally positive matrices with their combinatorial connections and the spectral properties, Jacobi matrices and their implications to continuous time stationary Markov processes in discrete state space, and Determinantal properties of Sylvester, Gantmacher and MG Krein.*

The course will be delivered through lectures on the topic in-depth and tutorials.

A limited number (up to 20) of seriously interested students (Doctoral/Post-doctoral) with a good background of Linear Algebra and Calculus will be selected for participation in the workshop. They having basic knowledge of Markov Chains and Continuous Time Discrete Stochastic Process is appreciated.

***Note**: Certificates will be issued only to the participants who complete the tutorial assignments.*

Registration Fee
Indian Students: **6000 INR + GST**
Foreign Students: **300 USD**

Accommodation
If required, will be arranged in the guest house at the occupant's expense.

Financial Support
A few students (up to 6) will be partially sponsored by CARAMS, MAHE under Scientific Social Responsibility of different projects. Selection depends on the Supervisor/HOD's recommendation describing the possible benefits to the candidate. Candidates aspiring the support may write to the Coordinator of CARAMS (kmprasad63@gmail.com) or to T E S Raghavan (terctu@gmail.com) immediately after the registration, attaching the necessary recommendation.

Important Dates
Deadline for Registration: ***November 30, 2021***
Submission of recommendation by Supervisor/HOD: ***November 30, 2021***
Selection Intimation from Organizer: ***December 06, 2021***
Selection for Support: ***December 10, 2021***

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Associated Departments: Dept. of Data Science, PSPH, MAHE | Dept. of Mathematics, MIT, MAHE | Dept. of Mathematics, SMIT, Sikkim

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For details, visit: https://carams.in/events/actgmg_2021/

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