



भारतीय प्रबंध संस्थान बेंगलूर  
INDIAN INSTITUTE OF MANAGEMENT  
BANGALORE

The Decision Sciences Area at IIM Bangalore welcomes you to a webinar, titled:

**'On solving a fractional programming formulation to determine the independence number of a graph'**

by  
**Professor  
Jitamitra Desai**

**Date: 9<sup>th</sup> July, 2021**

**Time: 3:00 p.m. to 4:00 p.m.**



### **Abstract:**

Prof. Desai's talk will be based on a research study of the NP-Hard maximum independent set problem from a continuous fractional programming (FP) formulation perspective. He will compare and contrast this FP formulation with the well-known 0-1 linear programming formulation.

He will explain how a new class of clique sets is defined, and how the structure of these clique sets is utilized to derive explicit characterizations of the number of alternate optima present in both discrete and continuous formulations. Such clique sets also enable a simple, yet powerful, construction procedure to efficiently determine maximal independent sets. Prof. Desai and his fellow researchers have also developed a global optimization algorithm to solve the FP formulation, and they demonstrate that such a continuous approach stays on par with the 0-1 discrete formulation with respect to various performance metrics. They show that the computational time required per optimal solution is comparable and, in some instances, lower for the continuous formulation as compared to its discrete variant (as the number of alternate optima for Problem FP is significantly greater when compared to Problem MIS).