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DIPARTIMENTO DI INGEGNERIA
MECCANICA, ENERGETICA
E GESTIONALE

Social Student Grouping and Seating Problems

Seminar & Activity!



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15:00 - 17:00

Aula Seminari Dimeg 44C

DIMEG



Abstract: We first present a novel method for assigning students to course project teams that is based on social network analysis and optimization. It is so important for the students' educational, personal, and professional success to collaborate within a strong and diverse peer network. Therefore, we aim at expanding the students' social networks through a grouping strategy that provides each individual maximal opportunity to establish new ties. In our data-driven approach, we suggest a process for surveying existing connections in the class social network. We show that the underlying difficult combinatorial problem, a variant of the so-called bin packing problem, can be formulated as an integer program and solved to optimality using mathematical optimization. Model extensions are discussed that account for high-density networks, team balancing, and mate forcing and forbidding, allowing for hybridization with existing grouping techniques. In an empirical study, we use data from 10 industrial engineering classes including 255 students and 77 project teams, in both modes face-to-face and virtual. We study potential and impact of our process, compared to commonly used random-assignment, self-selection, and clique-oriented grouping. The number of ties can be increased by an impressive 62% compared to only 17% when allowing students to self-assign. Moreover, student feedback strongly supports the usefulness of our idea for adaptive class management and student contentment. In a second part, we develop a related method that assigns students to seats maximizing the overall opportunities to get to know neighbors. In a class activity, we apply this technique to the current classroom and derive an optimized social seating arrangement.