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Title: Optimized Interdisciplinary Research Team Formation Using a Genetic Algorithm and Publication Metadata Records

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Abstract: Forming interdisciplinary research teams is challenging, especially when the pool of candidates is large and/or the addressed research projects require multi-disciplinary expertise. Based on their previous research outputs, like published work, a data-driven team formation procedure selects the researchers that are likely to work well together while covering all areas and offering all skills required by the multi-disciplinary topic. The description of the research team formation problem proposed in this paper uses novel quantitative metrics about the team candidates computed from bibliographic metadata records. The proposed methodology first analyzes the metadata fields that provide useful information and then computes four synthetic indicators regarding candidates' skills and their interpersonal traits. Interdisciplinary teams are formed by solving a complex combinatorial multi-objective weighted set cover optimization problem, defined as equations involving the synthetic indicators. Problem solving uses the NSGA-II genetic algorithm. The proposed methodology is validated and compared with other similar approaches using a dataset on researchers from Politehnica University of Timisoara extracted from the IEEE Xplore database. Experimental results show that the method can identify potential research teams in situations for which other related algorithms fail.

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