ΤΜΗΜΑ ΜΗΧΑΝΙΚΩΝ Η/Υ ΚΑΙ ΠΛΗΡΟΦΟΡΙΚΗΣ · ΠΑΝΕΠΙΣΤΗΜΙΟ ΙΩΑΝΝΙΝΩΝ
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING · UNIVERSITY OF IOANNINA

Σ Ε Μ Ι Ν Α Ρ Ι Ο Τ Μ Η Μ Α Τ Ο Σ



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ΗΜΕΡΟΜΗΝΙΑ: **Παρασκευή, 20 Νοεμβρίου 2026**

ΩΡΑ: **12:00**

ΑΙΘΟΥΣΑ: **Αίθουσα Σεμιναρίων**

Θέμα

Algorithmic Fairness in Networks

Περίληψη

The widespread adoption of machine learning and data science algorithms has raised concerns about their potential to discriminate against minorities and under-represented groups. Consequently, algorithmic fairness has emerged as an important area of research, focusing on the design of algorithms that satisfy formal fairness guarantees.

Networks provide a fundamental framework for modeling and analyzing complex systems of interconnected entities across diverse domains, including social, financial, and collaboration networks. A wide range of algorithms exploit network structure to extract useful information, for example, by estimating the importance of individual nodes or identifying communities. However, in many real-world networks, nodes are also associated with sensitive attributes, such as gender or race, which define distinct demographic groups. The network structure can interact in complex ways with the group membership of nodes, potentially resulting in inequitable outcomes that systematically disadvantage certain groups. This raises the question of how to incorporate group fairness into network algorithms while preserving their utility.

In this talk, we address this question by studying fairness in three fundamental network problems: assessing node importance through the celebrated PageRank algorithm, modeling opinion formation processes on networks, and detecting communities. We adopt a group fairness perspective, requiring that different groups receive equitable representation in the outcomes of these algorithms. We focus on in-processing approaches, which incorporate fairness directly into the algorithms to produce fair outcomes. Our experimental results demonstrate that fairness can be substantially improved while maintaining the utility of the underlying algorithms.

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