ALGORITHMIC FAIRNESS AND ETHICS

Sercan Külcü | 30.05.2023

Contents

1   Introduction

Algorithmic fairness and ethics play a crucial role in algorithmic game theory by addressing the potential biases, discrimination, and ethical implications that may arise in the design and deployment of algorithms within game-theoretic frameworks. Here's how algorithmic fairness and ethics are considered in the context of algorithmic game theory:

- Bias and Discrimination Mitigation: Algorithmic game theory investigates techniques for mitigating biases and discrimination in algorithmic systems used within games. This involves identifying and addressing biases in data, algorithm design, and decision-making processes to ensure fair and equitable outcomes for all participants.
- Fairness Metrics and Definitions: Algorithmic game theory explores the development and application of fairness metrics and definitions specifically tailored to game-theoretic scenarios. These metrics help assess and measure fairness in the outcomes of games and algorithms, guiding the design of fair game mechanisms.
- Strategic Behavior and Manipulation: Algorithmic fairness and ethics consider how strategic behavior and manipulation can impact the fairness and ethical implications of game outcomes. Game-theoretic models are used to analyze strategic possibilities, incentives for manipulation, and the resulting implications for fairness and ethics.
- Transparency and Explainability: Algorithmic game theory emphasizes the transparency and explainability of algorithms within games. Participants should be able to understand the decision-making processes and the factors influencing game outcomes. This allows for the identification and mitigation of biases, as well as the detection of unethical practices.
- Accountability and Responsibility: Algorithmic fairness and ethics in game theory address issues of accountability and responsibility. Developers, designers, and participants should be accountable for the decisions made by algorithms within games. This includes mechanisms for addressing any negative consequences, providing recourse, and ensuring the ethical standards of the game.
- Value Alignment: Algorithmic game theory considers the alignment of algorithmic systems with societal values and ethical principles. It explores how to incorporate ethical considerations into the design and implementation of game mechanisms, ensuring that the objectives of the game are compatible with broader societal goals.

- Impact Assessment: Algorithmic fairness and ethics involve conducting comprehensive impact assessments of algorithmic game systems. This includes analyzing the potential consequences of the algorithms on participants, power dynamics, and societal implications. Such assessments help identify and mitigate any unfair or unethical impacts of algorithmic game systems.
- Regulatory and Policy Frameworks: Algorithmic fairness and ethics in game theory are increasingly being addressed through regulatory and policy frameworks. Governments and organizations are developing guidelines and regulations to ensure fairness, transparency, and ethical practices in algorithmic game systems, protecting participants and fostering a level playing field.

By considering algorithmic fairness and ethics in algorithmic game theory, researchers and practitioners can develop game mechanisms that promote fairness, mitigate biases, and uphold ethical standards, thus creating a more inclusive and equitable gaming environment. This helps build trust among participants and ensures that game outcomes align with societal values and ethical principles.