1163-91-1633   **Dashiell E.A. Fryer*** (`dashiell.fryer@sjsu.edu`), One Washington Square, San Jose, CA
95192. *Analyzing Fairness of Social Structures using Game Theory.*

Game theory is the study of decision making when the outcomes for each individual player is dependent the choices of all the players. If a graph is added, where vertices are players and edges represent interaction between players, the game theory model can be used to analyze social structure.

A key concern of social structure is the notion of fairness to the constituents. A recent model, suggested a definition of fairness based on average payoff across the population of players per game could be used to compare fairness of different network structures. A recent student and I show that under equivalent circumstances we show the same increase in average payoff to players given the same graphs, but also show a corresponding increase in payoff variance. In simplest terms, rich players (well-connected) became richer, while less wealthy players (almost isolated) became poorer in these same graphs. We suggest that a definition of fairness should account for payoff variance as well as average at the very least.

I will also survey some current projects looking at similar issues by our undergraduate and master students. (Received September 15, 2020)