

Research on the Sharing Economy about Resource Sharing in Social Interactive Networks

Zihang Xu, Master of Science in Computer Science

University of Dublin, Trinity College, 2020

Supervisor: Georgios Iosifidis

In the 21st century, the economic globalization has been facilitated a lot by the new scientific and technological revolution. Especially in the field of economic life, sharing economy and collaborative consumption are becoming trends in the society and they focus more on sharing and interactions among us. This thesis aims at finding out how the position of participants and the variance of resources affect the wealth of participants and the sharing level and the wealth inequality of the sharing networks. We invited 24 human players who were divided into 4 groups where there were already 6 AI players in each group to participate in WIFI sharing games where the human players needed to make their own sharing decisions and the AI players would follow a predefined sharing strategy. There were 20 WIFI sharing games totally where the variance of resources had 5 different values, all the participants were randomly embedded in networks with the same graph density. Our analysis showed that the wealth of a player was proportional to the degree of the player and if the variance was larger, the speed of the increase in wealth as the player having more neighbors would be slower. We also found out that as the variance increased from 10 to 50 Mbps, the path of the change of the Gini coefficient (representing the wealth inequality) was pretty like a letter 'W' while that of the sharing coefficient (representing the sharing level) was like a letter 'M', which indicated that if the variance was moderately smaller or larger than half of the base resource (60 Mbps), the sharing level of the whole network would reach a high position and more importantly, a higher sharing level would be beneficial to alleviate the wealth inequality of a society. We conclude that participants in a resource sharing network are supposed to maintain a good relationship with their neighbors by balancing the resources shared to different neighbors to assure that they will not be abandoned by any neighbor. In addition, for the network designers, they should control the resources to make it fluctuate in a reasonable range and provide the administrators with the right to adjust the variance by changing the logical structure of the network or updating the necessary supportive equipment so that the variance will arrive at an ideal value. In conclusion, all the research in my thesis is aimed at helping the members of a social network to gain more benefits from the network with a low level of wealth inequality so that the people in the network will enjoy a stronger sense of happiness.