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The network of occupation space needs for economic improvement

Mostafa Saeidi¹, Ramya Akula¹, Steven Scheinert¹, Anamaria Berea¹ and Ivan Garibay¹

¹ University of Central Florida

Complex Adaptive Systems Laboratory

msaeidi@knights.ucf.edu, ramya.akula@knights.ucf.edu, steven.scheinert@ucf.edu

anamaria.berea@ucf.edu, igaribay@ucf.edu

Abstract

Certain occupations are found in specific cities based on their required knowledge, type of training, and labor skills which are available on those cities (Wixe and Andersson, 2017). As skills diversify the occupational structure of each region, the connections between skills demonstrate the occupation diversification. According to Alabdulkareem et al. (2018), skills drive occupations and the skills network shows the structure of labor dynamics between occupations. Existing research has investigated the occupation diversification according to the skills network (Muneepeerakul et al., 2013 Anderson, 2017; Yildirim and Coscia, 2014) and the location of U.S metropolitan areas in the skills network (Alabdulkareem et al., 2018), but not how the location of cities in the network has changed and how occupation diversification occurs in an urban area over time. Understanding occupations diversification is relevant since it drives diversity in the local economy which drives the health of the local economy and diversity of the labor market. This research applies existing skills network which was introduced by Alabdulkareem et al. (2018) to study occupation diversification of metropolitan areas over time and investigate the pattern of city expansion and contraction in the skills space network. The results of this research will present a new form of economic structure based on the occupation diversification which helps policymakers to increase innovation in the service sector, reduce the unemployment rate, and introduce new occupations that are related to the previous occupations in the region.

To conduct this research, a quantitative comparison is presented. Applying the skills data for six U.S. metropolitan areas in the 10-year period and visualizing where metropolitan areas are located in the skills space network over time. Fastest and slowest-growing metropolitan areas based on their populations are retrieved from Irisform Design website (U.S metros growth map, 2015). Furthermore, occupational skills data for U.S metropolitan areas are available from the Bureau of Labor Statistics (BLS) and O*NET database. These various visualizations allow us to investigate how cities expand or contract their occupation diversification over time. Figure 1 shows the density of relationships among occupations in different types of occupations. The occupations are linked by the similarity in their skills they share. This research applies a data-driven methodology and network science to map skills space for selected metropolitan areas and explore how metropolitans position in the network change over time.

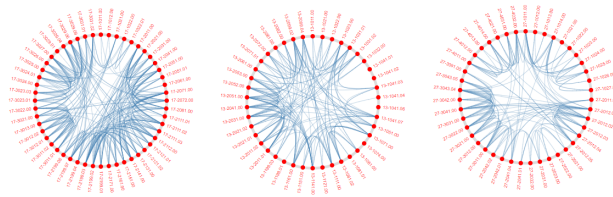


Figure 1: The density of interactions between occupation in three different service sectors (Architecture and engineering - Business and financial operations - Arts, design and media) [0, 10].