Ph.D. Dissertation Defense

Candidate:	Shiyan Zhang
Degree:	Doctor of Philosophy
School/Department.:	Interdisciplinary / Data Science
Date:	Monday, April 15, 2024
Time:	1:00 – 2:30 pm
Location:	Babbio 601
Title:	Three Essays on Digital Skills and Their Roles in Occupations
Chairperson:	Dr. Jeffrey V. Nickerson, Information Systems, School of Business
	Dr. Michael zur Muehlen, Information Systems, School of Business
Committee Members:	Dr. Aron Lindberg, Information Systems, School of Business
	Dr. Stefano Bonini, Finance, School of Business
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Abstract

This dissertation focuses on the structures and impacts of digital skills in the rapidly transforming labor market. It is rooted in the premise that understanding the value of digital skills requires a relational perspective, acknowledging that these competencies are not isolated, but form complex structures across different occupations. The dissertation explores this through three interconnected essays.

The first essay, *"Digital Skills Decomposability and Bundle Similarity in Relation to Mobility"* delves into the concept of digital skill decomposability and investigates how the distinctiveness of such digital skill bundles can facilitate occupational transitions, thereby amplifying workforce mobility. It is posited that occupations characterized by more decomposable digital skill sets have a better chance to adapt and transition within the shifting labor market. This is associated with the portability of these skill sets, which can form bridges to various occupations.

The second essay, *"Digital Technology Diversity and the Value of Occupations"* shifts the focus toward the impact of digital skill diversity on wage outcomes. By developing indices separation and disparity to measure technology diversity, this study provides a novel perspective on how the structure of technology use within professions can influence wage levels. The findings suggest that low separation and high disparity of technology usage in occupations are related to higher wages. This effect is stronger in occupations that have a higher level of computer interaction.

The final essay, *"Creative Work, Digital Technology, and Innovation in Occupations"* explores the relationship between creative tasks, digital technology, and innovation within various professions. It specifically examines the symbiotic relationship between creative tasks and digital technologies, using the semantic distance between their textual descriptions, thereby elucidating the mechanism through which technology can be integrated into creative work and foster innovation. This inquiry is particularly pertinent in the context of emerging technologies, such as artificial intelligence, which further blur boundaries between creative tasks and technological competencies.

Each essay offers noteworthy theoretical insights and practical implications for job seekers, educators, and policymakers. The findings underscore the interconnectedness of digital skills in the labor market, prompting a more nuanced approach to workforce development in the digital age.