Abstract

MINING SPATIAL ASPECTS OF CYBERPHYSICAL COMMUNITIES

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This dissertation studies the newfound concept of cyberphysical communities, focusing in particular on their manifestation through social media activities, and on the role of distance in communities formed in physical and cyber spaces. We use the term *cyberphysical* in the context of this dissertation to refer to communities that comprise physical members (i.e. individuals) whose communications are observed in the cyber space (and in particular through social media). The main objective of this dissertation is to investigate whether the well-accepted Tobler's First Law in the physical space is also applicable to these cyberphysical communities. Simply put, Tobler's First Law states that while everything is related to everything else on the Earth's surface, near things are more related than distant things.

While this has long been an accepted concept for activities and processes manifesting themselves in the physical space, newfound capabilities to interact through cyber space have introduced the potential to interact and form communities regardless of the cost of physical distance. Cyber interactions offer the potential to bypass the physical distance, and allow people to interact with anyone, anywhere in the world. The question still remains: does physical distance limit or drive the spatial distribution of cyberphysical communities, making them subject to Tobler's Law? While there have been some partial studies of issues related to this question, there is still a lack of a thorough study of the spatial characteristics of cyberphysical communities, and this is the gap that this dissertation is attempting to bridge. By comparing the distance distributions for three cyber communities and three physical communities, we show how distance plays an important role in cyberphysical communities.