Computational Socioeconomics

Jian Gao[a,b,c], Yi-Cheng Zhang[d,e,*], Tao Zhou[a,c,f,**]

[a] *CompleX Lab, University of Electronic Science and Technology of China, Chengdu 611731, PR China.*
[b] *MIT Media Lab, Massachusetts Institute of Technology, Cambridge, MA 02139, USA.*
[c] *Big Data Research Center, University of Electronic Science and Technology of China, Chengdu 611731, PR China.*
[d] *Institute of Fundamental and Frontier Science, University of Electronic Science and Technology of China, Chengdu 610054, PR China.*
[e] *Department of Physics, University of Fribourg, CH-1700 Fribourg, Switzerland.*
[f] *Institution of New Economic Development, Chengdu 610110, PR China.*

Abstract

Uncovering the structure of socioeconomic systems and timely estimation of socioeconomic status are significant for economic development. The understanding of socioeconomic processes provides foundations to quantify global economic development, to map regional industrial structure, and to infer individual socioeconomic status. In this review, we will make a brief manifesto about a new interdisciplinary research field named *Computational Socioeconomics*, followed by detailed introduction about data resources, computational tools, data-driven methods, theoretical models and novel applications at multiple resolutions, including the quantification of global economic inequality and complexity, the map of regional industrial structure and urban perception, the estimation of individual socioeconomic status and demographic, and the real-time monitoring of emergent events. This review, together with pioneering works we have highlighted, will draw increasing interdisciplinary attentions and induce a methodological shift in future socioeconomic studies.

Keywords: Socioeconomics; network science; data mining; machine learning

Contents

*Corresponding author at: Department of Physics, University of Fribourg, CH-1700 Fribourg, Switzerland.
**Corresponding author at: CompleX Lab, University of Electronic Science and Technology of China, Chengdu 611731, PR China.
Email addresses: gaojian08@hotmail.com (Jian Gao), yi-cheng.zhang@unifr.ch (Yi-Cheng Zhang), zhutou@ustc.edu (Tao Zhou)