Ph.D. Dissertation Defense

Candidate:	Necdet Gürkan
Degree:	Doctor of Philosophy
School/Department.:	School of Business / Business Administration
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Location:	Babbio 601
Title:	A Computational Basis for Consensus-Aware Technologies
Chairperson:	Dr. Jordan W. Suchow, Information Systems, School of Business
Committee Members:	Dr. Bei Yan, Information Systems, School of Business Dr. Samantha Kleinberg, Computer Science, School of Engineering Dr. Jeffrey Nickerson, Information Systems, School of Business Dr. Aron Lindberg, Information Systems, School of Business Dr. Gert-Jan de Vreede, Information Systems and Management, Muma College of Business, USF

Abstract

This dissertation studies the advancement of consensus-aware technologies in the context of collective decision-making, focusing on the integration of these technologies into information systems to effectively represent, detect, and characterize consensus among people and other agents. The dissertation addresses these challenges by extending Cultural Consensus Theory (CCT) to form a computational foundation for consensus-aware information technology applications. The dissertation consists of six chapters. Chapter 1 defines the construct of consensus-aware technologies and then examines tools and technologies to determine whether current tools and technologies qualify as consensus-aware technology under this construct. Chapter 2 describes CCT, a classic mathematical modeling framework for characterizing consensus beliefs. Chapter 3 extends CCT to include the temporal dynamics of enculturation through the learning and adopting of consensus beliefs to study online communities. Chapter 4 extends CCT to settings where the number of cultures is not known a priori through a Bayesian nonparametric model based on the Dirichlet Process and applies the model in a study of consensus beliefs in the public perception of Artificial Intelligence (AI) technologies. Chapter 5 extends CCT to leverage knowledge bases in the form of pretrained deep neural network embeddings. Chapter 6 argues that CCT can serve as a computational basis for a new generation of consensus-aware information technologies and provides a conceptual framework for understanding the ways that a consensus-aware IT artifact can intervene to build consensus among a group. The ultimate goal is to enable IT artifacts to facilitate consensus-building across various contexts, including business, politics, and scientific research, by reflecting a wide range of perspectives for more inclusive and equitable decision-making processes.