

# UNIVERSITY OF SOUTH FLORIDA

## Major Research Area Paper Presentation

Modelling Effective Visualization Using Graphical Encoding Perception

by

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For the Ph.D. degree in Computer Science and Engineering

Knowledge of human perception and cognition have long been incorporated into the design of visualizations to enhance their effectiveness. The choice of graphical encoding, the visual channels used to represent data, in particular impacts the quality of decision making when using visualizations. However, before cognitive processes can analyze data to make decisions, the visualization passes through the human perceptual system, which can strongly influence a user's understanding of the data, and thus their decision making process. Studies of perceptual judgment of graphical encoding have helped researchers to understand the impact of encoding perception and biases in a variety of visual analytics tasks. In this talk, we detail and demonstrates potential pitfalls, areas of improvement, and open problems requiring additional research with a focus on perception-based visualization studies. Next, we discuss building new models of perception, based topological data analysis, for scatterplots and line charts that are evaluated for tasks including clustering, statistical tasks, variation detection, uncertainties judgments. Using these models, visualizations can be optimized to provide concise, less ambiguous presentations of data, leading to better quality and higher confidence in decision making with visualization.

Monday, November 18, 2019

2:00 PM

ENB 313

**THE PUBLIC IS INVITED**

*Examining Committee*

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