Invited Talk

Monday, October 9th | 10 AM | BYENG 210

Space, Time, and Visual Analytics

Natalia Andrienko and Gennady Andrienko

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Biography

Natalia and Gennady Andrienko are lead scientists responsible for visual analytics research at Fraunhofer Institute for Intelligent Analysis and Information Systems in Germany and part-time professors at City University London. Results of their research on spatio-temporal data analysis have been published in two monographs "Exploratory Analysis of Spatial and Temporal Data: a Systematic Approach" (Springer 2006) and "Visual Analytics of Movement" (Springer 2013).

Gennady Andrienko chaired ICA Commission on GeoVisualization (2007-2015). He was a paper chair of IEEE VAST conference (2015-2016) and an associate editor of IEEE Transactions on Visualization and Computer Graphics (2012-2016). Currently, he is an associate editor of two journals, Information Visualization and International Journal of Cartography, and editorial board member of Cartography and Geographic Information Science.

Natalia Andrienko is an associate editor of IEEE Transactions on Visualization and Computer (Bio cont.) Graphics since 2016 and editorial board member of International Journal of Geographical Information Science, Journal of Geographical Systems and International Journal of Cartography.

Natalia and Gennady Andrienko received best paper awards at AGILE 2006, EuroVis 2015 and IEEE VAST 2011 and 2012 conferences, honorable mention awards at IEEE VAST 2010 and EuroVis 2017, best poster awards at AGILE 2007, ACM GIS 2011 and IEEE VAST 2016, and VAST challenge awards 2008 and 2014.

Abstract

Visual analytics aims to combine the strengths of human and computer data processing. Visualization, whereby humans and computers cooperate through graphics, is the means through which this is achieved. Sophisticated synergies are required for analyzing spatio-temporal data and solving spatio-temporal problems. It is necessary to take into account the specifics of the geographic space, time, and spatio-temporal data.

While a wide variety of methods and tools are available, it is still hard to find guidelines for considering a data set systematically from multiple perspectives. To fill this gap, we systematically consider the structure of spatio-temporal data, possible transformations, and demonstrate several workflows of comprehensive analysis of different data sets, paying special attention to the investigation of data properties. We shall show several workflows of analysis of real data sets on human mobility, city traffic, aviation, animal movement, and football.

We finish the talk by outlying directions for future research, including semantic level analysis and big data.

Hosted by: Ross Maciejewski