Paper Session:

3435 Spatial Mathematics

is scheduled on Thursday, 4/23/2015, from 1:20 PM - 3:00 PM in Picasso, Hyatt, West Tower, Bronze Level

Sponsorship(s):
Spatial Analysis and Modeling Specialty Group
Geography Education Specialty Group
Geographic Information Science and Systems Specialty Group

Organizer(s):
E Morris - University of Texas At Dallas
Sandra Arlinghaus
Joseph J. Kerski - Esri

Chair(s):
E Morris - University of Texas At Dallas

Abstract(s):

1:20 PM Author(s): *E Morris - University of Texas At Dallas

Abstract Title: *From Cantor to Christaller*

1:40 PM Author(s): *Sandra Arlinghaus -
Joseph Kerski, Ph.D. - ESRI

Abstract Title: *Spatial Mathematics*

2:00 PM Author(s): *James Gaboardi - Florida State University, Department of Geography
Mark W Horner, PhD - Florida State University, Department of Geography

Abstract Title: *The Effects of Centroid Connector Density on Spatial Network Optimization Models*

2:20 PM Author(s): *Qing Luo -

Abstract Title: *Taxi Fixed Point: An Equilibrium State of Taxi Flows in Dynamic Traffic Network*

2:40 PM Author(s): *Barry Joel Kronenfeld - Eastern Illinois University
Timothy F Leslie - George Mason University

Abstract Title: *Restricted Random Labeling: A null model of spatial interaction between groups in multi-group geographic datasets*

Session Description: Research addressing mathematical concepts can be enhanced by incorporating geography and conversely studies of geographic phenomenon gain strength by understanding the associated mathematics. There are numerous fundamental and complex relationships between location and mathematics such as proximity, spatial connectivity, and neighborhood effects. Such notions form quantitative links between geography and mathematics, and they can be addressed by the analytical and visualization tools incorporated into geographic information systems (GIS). In

general, the spatial mathematics session intends to reveal the nature in which tendencies can be masked or exaggerated by spatial configurations. The session intends to highlight methods for improving geographic modeling, visualization within GIS, and interpretation of spatial trends. A range of topics will be addressed including:

- Coloring and pattern applications from the theory of groups
- Teaching mathematics in a spatial context
- Incorporating mathematics into geography
- Probability and GIS
- Geometry of cities
- Grid based measurements and directions
- Fractal components of urban theories

New Query