

**PRSCO 2019**

The 16<sup>th</sup> PRSCO SUMMER INSTITUTE



**New Landscape of Data and Sustainable Development**

Chulalongkorn University, Bangkok, Thailand

July 25-27, 2019

## **Nurturing New Talent 2019 Workshop on Urban and Regional Complex Systems**

**The 16<sup>th</sup> PRSCO SUMMER INSTITUTE**

**New Landscape of Data and Sustainable Development**

**27 July 2017**

**Executive 1 &2, Pathumwan Princess Hotel**

### **Schedule:**

8:00	Registration
9:00	<b>Workshop on Remote Sensing to Support Research in Regional Science</b> Associate Prof. Dr. Gang Chen (University of North Carolina at Charlotte)
12:00	Lunch
13:00	<b>Workshop on Spatial Agent-Based Modeling</b> Associate Prof. Dr. Yuri Mansury (Illinois Institute of Technology)
17:00	Adjourn

### **Registration:**

Due to limited space available, workshop participants are required to register for the workshop via the QR code below:



**Note:** you will receive a confirmation email if you are successfully registered for the workshop.

# Workshop 1

**Workshop Title:** Remote Sensing to Support Research in Regional Science

**When and Where:** July 27, 2019, 9:00-12:00, Executive 1 & 2, Pathumwan Princess Hotel

**Organizer:**

**Dr. Gang Chen**

Department of Geography & Earth Sciences

University of North Carolina at Charlotte

Charlotte, NC 28223, USA

[Gang.Chen@uncc.edu](mailto:Gang.Chen@uncc.edu)



**Summary:**

Satellite and airborne remote sensing significantly reduces the needs (thus the costs) of field measurements, while providing spatially explicit observations of our changing landscapes across spatial and temporal scales. In the community of regional science, researchers have begun to apply remotely sensed data to understand the complex processes behind various, observable phenomena, such as urbanization, deforestation, and changes in biodiversity and agricultural productivity. The main objective of this half-day workshop is to offer a basic instruction in the use and interpretation of remote sensing systems, data, and products, which aims to benefit regional scientists with little or no background in remote sensing. The workshop includes three major parts: (i) remote sensing concepts, platforms and sensors, (ii) free and open-access remote sensing data and products, and (iii) hands-on experience of applying free Google Earth Engine to complete powerful, yet easy remote sensing image processing for various information needs (please bring your own laptop and register at the Earth Engine website to get an access to the service prior to the workshop).

**About the workshop organizer:**

Dr. Gang Chen is an Associate Professor in the Department of Geography and Earth Sciences at the University of North Carolina at Charlotte, USA. His research focuses on the application of multi-sensor remote sensing to monitor the change of forest ecosystems and understand how natural (e.g., climate change, fire, and plant disease) and anthropogenic factors (e.g., urban development, and the construction of hydroelectric dams) drive the change. He has been working on a variety of projects, across several regions/countries including Antarctica, Brazil, Canada, China, Myanmar, Thailand, Turkey, and the United States. Dr. Chen serves as an Associate Editor of *ISPRS Journal of Photogrammetry and Remote Sensing*, which is the official journal of the world's leading remote sensing society – *International Society for Photogrammetry and Remote Sensing* (ISPRS). He received the 2016 Early Career Scholar in Remote Sensing Award from the *American Association of Geographers* (AAG), 2015 Junior Faculty Development Award from UNC Charlotte, 2014 North Carolina Space Grant New Investigators Program Award, 2011-2012 NSERC Visiting Fellowship from Natural Resources Canada, and 2011 National Best Ph.D. Thesis Award from the Canadian Remote Sensing Society.

## Workshop 2

**Workshop Title:** Spatial Agent-Based Modeling

**When and Where:** July 27, 2019, 13:00-17:00, Executive 1 & 2, Pathumwan Princess Hotel

**Organizer:**

**Dr. Yuri Mansury**

Department of Social Sciences

Illinois Institute of Technology

Chicago, IL 60616, USA

[ymansury@iit.edu](mailto:ymansury@iit.edu)



**Summary:**

Following the success at the NARSC meetings and at last year's RSAI World Congress, we invite participants of the 2019 PRSCO Summer Institute to a half-day workshop on spatial agent-based modeling. The workshop provides an overview of current topics and state-of-the art in agent-based modeling. Of primary focus are the mechanics of model development, for which participants will receive the hands-on tutorial geared to beginners. NetLogo is the main programming platform. Bottom-up models of spatial patterns emerging from the decentralized actions of heterogeneous agents will be explored. Examples covered include models of Residential Segregation and Iterated Prisoner's Dilemma. The workshop will proceed in stages where (i) the implementation of a simple ABM is demonstrated, (ii) a GIS module is integrated, and (iii) participants are walked through in-class exercises. Emerging topics at the intersection of regional science and computational modeling will be discussed.

**About the workshop organizer:**

Yuri Mansury (Ph.D. in Regional Science) is a tenured Associate Professor of Social Sciences at Illinois Institute of Technology, USA. He has developed two courses on computational methods in regional science, one of which focuses on spatial agent-based modeling, and is the methodological foundation for one section of this workshop. He has published numerous peer-reviewed articles in the *Annals of Regional Science*, *Regional Science Policy and Practice*, *Journal of Economic Dynamics and Control*, and *Economic Development Quarterly*, among other outlets, and the author of numerous book chapters and conference presentations.

**Tentative Agenda:**

The workshop is designed as a four-hour tutorial with the following schedule:

Hour 1

Logistics, introduction to ABM, motivation, some basic definitions, and a brief history of ABM in regional science.

Hour 2

Introduction to Schelling's model of Residential Segregation, simulating a pre-programmed implementation, and discussion

Hour 3

Implementing the Residential Segregation algorithm in NetLogo

#### Hour 4

Extensions: Integrating geographic information systems (GIS) data into an agent-based model.  
Examining impact of parameter tuning and spatial analysis.

#### **Highlights:**

Participants will learn the implementation of a simple ABM, and how to integrate GIS maps into a spatial model.

#### **Intended audience:**

The workshop is intended for anyone interested in exploring the use of agent-based modeling approaches for teaching and geo-spatial research, but who has not had systematic training in the technical implementation.

#### **Hardware and Software Requirements:**

Every participant must bring a laptop, in which the latest version of NetLogo (free download from <http://ccl.northwestern.edu/netlogo/>) and the NetLogo GIS extension have been pre-installed. Laptops must have either USB 2.0 support or Wi-Fi connectivity to port materials and codes provided during the tutorial by the instructor.