# LOCATION ANALYTICS USING SPATIAL STATISTICS
## October 8 – 9, 2018

## COURSE DESCRIPTION

Many statistical techniques focus on the analysis of data based on its numeric or textual form. However, many of us overlook on one aspect of data: its location. Geography, which represents statistical data's spatial property, offers a lot of potential for gaining deeper insights on phenomena, such as population and demographics, among many others.

This session will focus on how to incorporate and leverage data's spatial property in doing statistical inquiry using a technology called Geographic Information Systems (GIS). The ArcGIS platform, a commercial industry-standard GIS software solution, and R, an open-source statistical package, shall be used separately and eventually integrated in this session. Specific techniques to be learned in this session include:

- Tabular data conversion and processing to spatial data
- Exploratory spatial data analysis
- Spatial and attribute-based querying
- Basic cartography
- Spatio-statistical analysis

## TARGET AUDIENCE

Statistical practitioners and students who do not yet have any prior knowledge or experience in using GIS, or current GIS users who want to learn the GIS capabilities of the ArcGIS platform in various statistical applications. Examples of scenarios to be presented include the following industries and domains to demonstrate the abovementioned techniques:

- Community-based socioeconomic profiling for local government offices
- Real property inventory and analysis for city and municipal assessors
- Field data collection for market research
- Spatial analytics for demographic studies

## PREREQUISITE KNOWLEDGE

Participants must have basic usage experience in Microsoft Excel or any other office spreadsheet applications. Some understanding of tabular data organization, mapping, and statistics is favorable for quick understanding of the topics to be presented, but not required.

R you ready? TRAINING PROGRAMS IN STATISTICS

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## TOPICS TO BE COVERED AND SCHEDULE

### DAY 1

| Time | Topic |
|---|---|
| 8:00 am – 8:30 am | Registration |
| 8:30 am – 10:00 am | Introduction to the Course Topics and Expectations |
| 10:00 am – 10:30 am | Break |
| 10:30 am – 12:00 pm | What is a GIS?<br>What is ArcGIS?<br>"Bridging" ArcGIS and R<br>Spatial data models<br>Anatomy of a spatial dataset<br>Overview of GIS applications in statistical practice |
| 12:00 pm -1:00 pm | Lunch |
| 1:00 pm – 3:00 pm | Feature extraction in ArcGIS<br>Example: Community-based socioeconomic profiling for local governement offices<br>Processing tables into spatial datasets<br>Example: Real property inventory for city and municipal assessors<br>Field data collection in ArcGIS<br>Example: Field data collection for market research |
| 3:00 pm – 3:30 pm | Break |
| 3:30 pm – 5:30 pm | Map data visualization in ArcGIS<br>Basic cartography in ArcGIS<br>Example: Spatial analytics for demographic studies |

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## TOPICS TO BE COVERED AND SCHEDULE

### DAY 2

| Time | Topic |
|---|---|
| 8:00 am – 8:30 am | Registration |
| 8:30 am – 10:00 am | Overview of spatial pattern analysis<br>Descriptive vs. inferential spatial statistics<br>Measuring spatial central tendency and spread |
| 10:00 am – 10:30 am | Break |
| 10:30 am – 12:00 pm | Measuring spatial clusters (global scale) in R<br>Example: Real property analysis for city and municipal assessors |
| 12:00 pm -1:00 pm | Lunch |
| 1:00 pm – 3:00 pm | Measuring spatial clusters (local scale) in R<br>Example: Customer behavior analysis for market research |
| 3:00 pm – 3:30 pm | Break |
| 3:30 pm – 5:30 pm | Spatial modeling in R<br>Example: Modeling the behavior of populations in demographic research<br><br>Recap and Conclusion |

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## ABOUT THE RESOURCE PERSON

Liz Linda Alindogan is a GIS specialist in the Training Division of Geodata Systems Technologies, Inc. and is one of the senior instructors who conducts basic to advanced GIS and GPS courses that covers desktop, geodatabase, mobile, and enterprise GIS. She has already earned multiple technical certifications from Esri for her experience in geodatabase management and usage of ArcGIS Desktop. She already conducted classes for numerous local and national government offices, such as the National Mapping and Resource Information Authority (NAMRIA), Mines and Geosciences Bureau (MGB), and the Metropolitan Waterworks and Sewerages System (MWSS); and for private/non-government organizations such as Maynilad, the Philippine Disaster Resilience Foundation (PDRF), and PrimeWater. Aside from teaching, she is also active is GIS project implementations, some projects with which she was engaged are the e-Tax Map Project of the Quezon City Assessor's Office, the GIS-Based Decision Support System of the Forest Management Bureau (FMB), and the Location Referencing System Project of the RoadBoard of the Philippines. She earned her degree on Bachelor of Science in Geodetic Engineering from the University of the Philippines, and is currently completing her master's degree on Geomatics Engineering in the same university. She also previously worked as a research assistant at the UP-Training Center for Applied Geodesy and Photogrammetry, and at the Philippine Institute of Volcanology and Seismology (DOST-PHIVOLCS).