Mathematics, Statistics, and Computer Science   **@ UIC**

Stat Lab Seminars

Robust Methods in Small Area Estimation

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Abstract: Modern societies have an ever-increasing appetite for reliable and up to date data to make informed decisions in both public and private sectors alike. While censuses, usually conducted once in a decade, provide reliable information about the population across various geography and demography, such information quickly get outdated each passing year after a census. To obtain a current picture of a population under study, suitable surveys are conducted to collect data from only a fraction of the population. Due to budget constraints, these surveys are inherently limited in size. While information gained from such surveys may be adequate for the entire population, the same data is often inadequately small when it is sliced and diced across geographic and demographic sub-populations. These sub-populations are termed small areas.

National Statistical Offices around the world have been mandated for many years to produce reliable small area statistics for many important variables such as population, income, unemployment, health outcomes, etc. Statistical summaries based on traditional direct estimates, computed using only sample data from individual small areas, are usually very unreliable. In small area estimation, by borrowing strength from other data sources, appropriate statistical methodologies have been developed to improve on the traditional direct estimates.

Monday, March 19 at 4:00 PM in SEO 612

In this talk, we propose new alternatives to some popular models in small area estimation. Model-based small area estimates are developed by shrinking direct estimates to suitable regression synthetic estimates, generated from the regression model for small area population means. Our new models are based on finite mixture of normal distributions. We implement our models using a hierarchical Bayesian approach.

This talk is based on collaboration with Gauri Sankar Datta and Adrijo Chakraborty.

Tea will be served at SEO 612.

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