PhD program in Statistics

DSS Statistics Seminar

October 20, 2023, 12:00

In person **Room 34 (CU002)**

Webinar **https://uniroma1.zoom.us/j/86881977368?pwd=SWRFcVFjMDZTa0lXZk05TE1zNm5adz09**

Passcode: 432940

Hidden Markov Models for error corrected statistics

Dimitris Pavlopoulos,
Mauricio Garnier-Villarreal

Vrije Universiteit Amsterdam, Sociology Department, The Netherlands

Policy making is based on official statistics that may still include measurement error (ME). This ME is typically the result of administrative delays in registration, differenced in conceptual definitions or processing errors. ME can lead to a distorted view of the number of people in groups of interest. Threatening the integrity of official statistics and therefore also the effectiveness of policies based on them.

HMMs are statistical models that help approximate categorical variables that are incorrectly measured with observed data. First, HMMs use two observed measures of the same statistic from different sources to approximate the error-corrected number of individuals at every moment in time. The two observed measures help to triangulate “true” information and reduce the effect of ME that exists in each of them. Second, HMMs estimate the transition rate from one state (e.g., receiving social assistance benefits) to other states (e.g. employment) and vice versa using the error-corrected measure that was approximated before. To do so, HMMs require several (at least three) observations in different time points per individual, which are available in our case in both registers.

This way HMM present a measurement model (error correction), and structural model (representing the relations and changes over time).

SAPIENZA
UNIVERSITÀ DI ROMA

Organized in collaboration with
Istat Advisory Committee
on statistical methods