

## **Mohammad-Reza NAMAZI-RAD, SMART**

This 20min talk is about his recently completed PhD research at CSSM and will be a preparation for the upcoming competition for the JB Douglas award.

**Title:** Contextual Effects in Modeling for Small Domain Estimation

**Abstract:** Many different Small Area Estimation (SAE) methods have been proposed to overcome the challenge of finding reliable estimates for small domains. Often, the required data for various research purposes are available at different levels of aggregation. If unit-level data are available, SAE is usually based on models formulated at the unit level, but they are ultimately used to produce estimates at the area level and thus involve area-level inferences. However, parameter estimates obtained from individual and aggregated level analysis may be different, in practice. This may happen due to misspecification of some substantial contextual effects in the individual-level analysis. Ignoring these effects leads to misleading results. This research investigates the circumstances when using an area-level model may be more effective. Synthetic estimators and Empirical Best Linear Unbiased Predictors (EBLUPs) are also evaluated in SAE based on different levels of linear mixed models. Using a numerical simulation study, the key role of contextual effects is examined for model selection in SAE.