MADHAWA Kaushalya & MALDENIYA Danaja

LIRNE Asia, Sri Lanka

The primary research focus is to leverage Mobile Network Big Data or more accurately Transaction Generated Data (TGD) to gain insights on a large scale-mobility mobility, that can inform transportation planning in developing economies. We have obtained continuous access to historical and anonymized data from multiple mobile network operators in Sri Lanka covering more than 50 percent of the population (more than 10 million people). Our work involves the following:

- Identifying trip generation and attraction
- Development of Origin - Destination (OD) Matrices
- Predicting transportation mode and speed
- Identifying the daily mobility motif distribution in specific urban areas
- Predicting human activities conditionally based on public land use data supplemented with application APIs such as FourSquare, WikiMapia etc.
- Modelling Traffic flows in urban areas utilizing the out the outcomes of previous stages and road network data
- Modelling socio-economic characteristics of populations based mobility characteristics as well as Re-fill datasets
- Identifying the levels and nature of social interactions

The challenges include unifying data from multiple operators accurately in the presence of anonymization, mapping cell tower based location data to fine grained administrative regions, compensating for sparse data and difficulties in validation due to scarcity of sources for getting ground truth values. At the present early stage of research preliminary work in identifying Home-Work hours, Work-Home locations at District Secretariat level, population density fluctuations during a day etc. has been done based on work by Sibren Isaacman et al.[1] Ongoing research includes trip generation, O-D matrices generation based on stay/stay region, virtual location concepts in work done by Gaston A. Fiore et al [2] as well transportation mode prediction.

The research on estimating mode of transport is based on temporal distribution trips as introduced by H.Wang et al.[3] and Virtual Cell Path approach from J.Doyle et al’s[4] work.