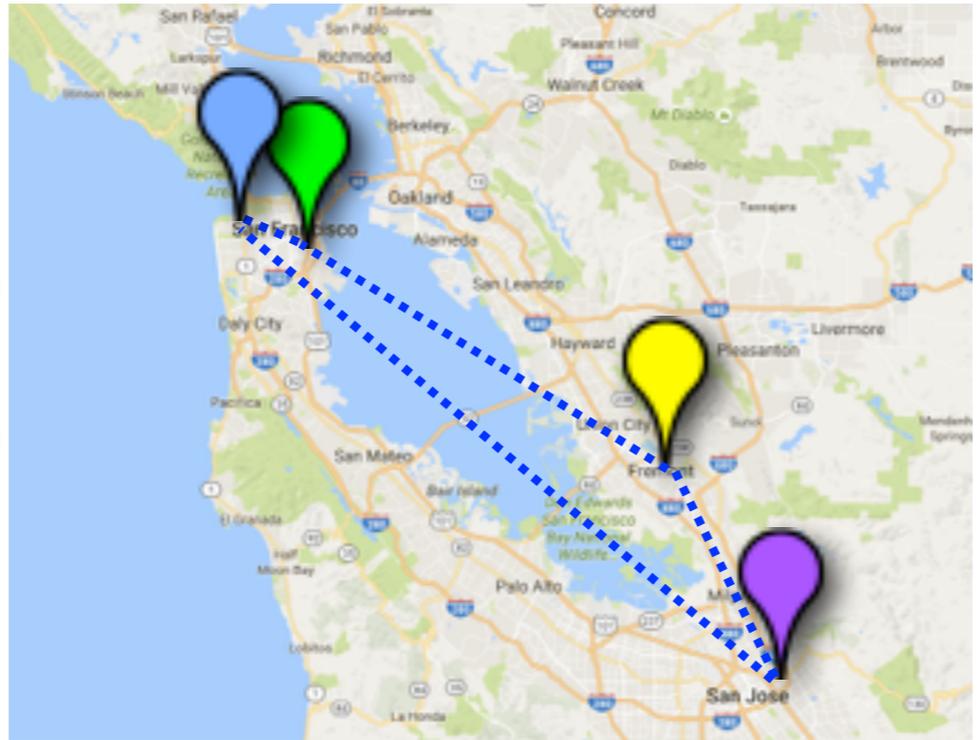
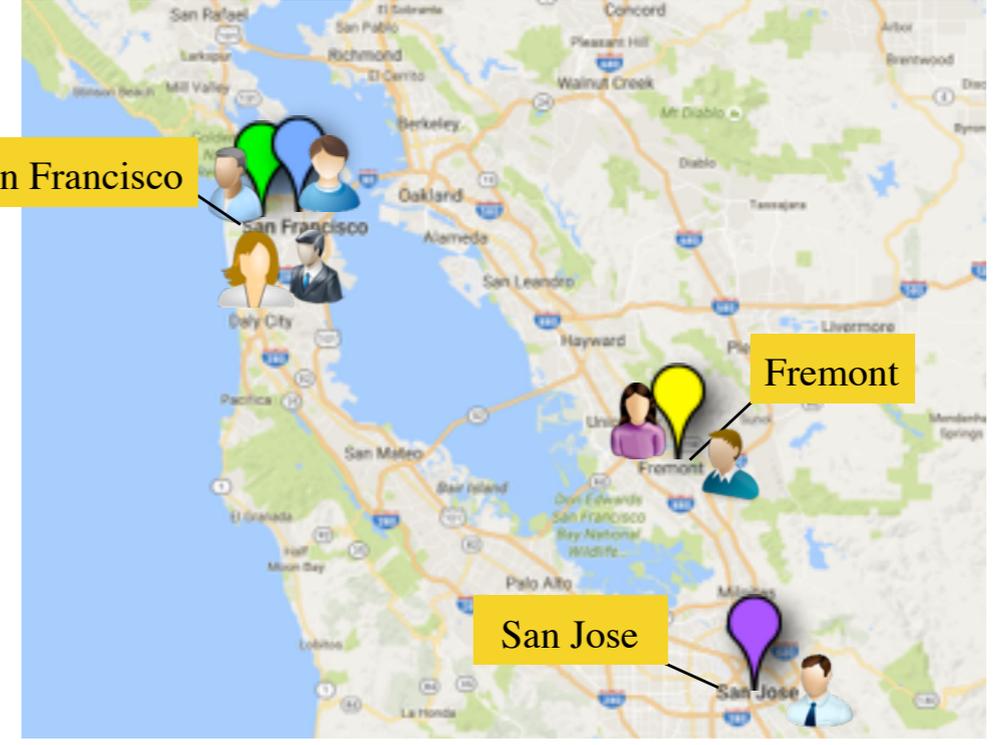


Social network   User-location network



Location affinity network



Geographical embedding space



Heterogeneous user network

**Collective Geographical Embedding (CGE)**