Multi-scale human mobility
what complex network theory can reveal
MOBILITY AND PANDEMICS

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- Thailand

SARS 2003

Thursday, February 11, 2010
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• pervasive data and mobility proxies
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• quantitative epidemic forecasts
pervasive data
Despite their importance for urban planning, traffic forecasting and the spread of biological and mobile viruses, our understanding of the basic laws governing human motion remains limited owing to the lack of tools to monitor the time-resolved location of individuals. Here we study the trajectory of 180,000 anonymized mobile phone users whose position is tracked for a six-month period. We find that, in contrast with the random trajectories predicted by the prevailing Levy flight and random walk models, human trajectories show a high degree of temporal and spatial regularity, each individual being characterized by a time-independent characteristic travel distance and a significant probability to return to a few highly frequented locations. After correcting for differences in travel distances and the inherent spatial resolution was determined by the local density of the more

pervasive data

complex network theory
Daniel Grady

Christian Thiemann

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