

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Limits of predictability in human mobility CHAOMING SONG, ZEHUI QU, NICHOLAS BLUMM, ALBERT-LASZLO BARABASI, CCNR, Northeastern University — A range of applications, from predicting the spread of human and electronic viruses to city planning and resource management in mobile communications, depend on our ability to foresee the whereabouts and mobility of individuals, raising a fundamental question: to what degree is human behaviour predictable? Here we explore the limits of predictability in human dynamics by studying the mobility patterns of anonymized mobile phone users. By measuring the entropy of each individual's trajectory, we find a 93% potential predictability in user mobility across the whole user base. Despite the significant differences in the travel patterns, we find a remarkable lack of variability in predictability, being largely independent of the distance user cover on a regular basis. We show that the origin of this deep-rooted predictability is the quantifiable regularity of human activity and discuss the potential implications of our findings.

Chaoming Song
CCNR, Northeastern University

Date submitted: 03 Dec 2009

Electronic form version 1.4