

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Underlying mechanisms for commuting and migration processes FILIPPO SIMINI, ALBERT-LASZLO BARABASI, Northeastern University, JAMES BAGROW, Northwestern University — Both frequent commuting and long-term migration are complex human processes that strongly depend on socio-demographic, spatial, political, and even economic factors. We can describe both processes using weighted networks, in which nodes represent geographic locations and link weights denote the flux of individuals who commute (or migrate) between locations. Although both processes concern the movements of individuals, they are very different: commuting takes place on a daily (or weekly) basis and always between the same two locations, while migration is a rare, one-way displacement. Despite these differences, a recently proposed stochastic model, the Radiation model, provides evidence that both processes may be successfully described by the same underlying mechanism. For example, quantities of interest for either process, such as the distributions of trip length and destination populations, appear remarkably similar to the model's predictions. We explore the similarities and differences between commuting and migration both empirically, using census data for the United States, and theoretically, by comparing these commuting and migration networks to the predictions given by the Radiation model.

James Bagrow
Northwestern University

Date submitted: 09 Nov 2011

Electronic form version 1.4