

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Quantifying patterns of research interest evolution TAO JIA, College of Computer and Information Science, Southwest University, China, DASHUN WANG, Kellogg School of Management, Northwestern University, BOLESŁAW SZYMANSKI, Department of Computer Science, Rensselaer Polytechnic Institute — Changing and shifting research interest is an integral part of a scientific career. Despite extensive investigations of various factors that influence a scientist’s choice of research topics, quantitative assessments of mechanisms that give rise to macroscopic patterns characterizing research interest evolution of individual scientists remain limited. Here we perform a large-scale analysis of extensive publication records, finding that research interest change follows a reproducible pattern characterized by an exponential distribution. We identify three fundamental features responsible for the observed exponential distribution, which arise from a subtle interplay between exploitation and exploration in research interest evolution. We develop a random walk based model, which adequately reproduces our empirical observations. Our study presents one of the first quantitative analyses of macroscopic patterns governing research interest change, documenting a high degree of regularity underlying scientific research and individual careers.

Tao Jia
Southwest University

Date submitted: 09 Nov 2016

Electronic form version 1.4