International Congress on Science and Engineering
HAMBURG – GERMANY
March 2018

Forecasting Science Hotspots Based on Keywords Network

Mustafa Seyed Moslemzadeh *

1. Sharif University of Technology – IRAN, moslemzadeh@ce.sharif.edu

Abstract

By analyzing keywords network from complex networks point of view, we are able to predict the future hotspots based on current trends, previous growth patterns that happened or with the power of different centrality measures like eigenvector etc. As an example, when a new keyword appears in a paper for the first time, complex network analysis will help us to predict the future possibility of this keyword to become a hotspot. Due to the weight of each node in keywords network, forecasting the future hotspots is done. While time is one of the important parameters of this process, and it is the driving force for dynamics of keywords network and forecasting the future hotspots. According to the history of changes in the keywords network in past years, we are able to predict its evolution and changes for later times leading to recent years.

Keywords: Keywords Network, Forecasting, Science Hotspots, Complex Network

1. Introduction

Forecasting the future science hotspots could be a good means to lead scientists to the new and hot disciplines of research fields. Keywords used in papers, due to the direct connection within the main purpose of the article could be a good option to analyze, forecasting the future hotspots. Dynamical complex network based analysis [1]fused with statistical analysis, estimations and data fusion methods, used to reach to this goal.

The ability to show the hotspots of the research subjects is one of the best consequences of the complex networks which can be gained from analysis of the keywords networks, citation networks, science collaboration networks and etc.

A rather complex network is formed by the citation patterns of scientific publications, the nodes standing for published articles and a directed edge representing a reference to a previously published article [1].Also citation networks have some pros and cons that we will not study on them in this paper.