

*A Nomenclature for the Standard Linguistic Description of the Kinematics of Networks

Jaderick P. Pabico and Eliezer A. Albacea

Institute of Computer Science

University of the Philippines Los Baños

College 4031, Laguna

{jppabico, eaalbacea}@{up, uplb}.edu.ph

Abstract

The rate of change $\partial M/\partial t$ of some metric M measured as one of the kinematic properties of a network described by a graph G transitioning from $G(V_t, E_t)$ to $G(V_{t+\partial t}, E_{t+\partial t})$ over time range ∂t has been described in the literature with linguistic descriptions that often provide ambiguity. For example, one rate of change $(\partial M/\partial t)_1$ has been described as “dynamic” and another $(\partial M/\partial t)_2$ as “highly dynamic” but $(\partial M/\partial t)_1 > (\partial M/\partial t)_2$. We propose in this paper a nomenclature for the standard linguistic description of the kinematics of networks in the hope that description in the literature will be standardized and understood with the corresponding quantitative meaning. We termed a network as “static” when $\partial M/\partial t = 0$, as “non-volatile” when $0 < \partial M/\partial t \leq 1$, and as “volatile” when $\partial M/\partial t > 1$. In the development of the linguistic nomenclature, we borrowed heavily from the standard used in signal theory to provide linguistic descriptions to various ranges for $\partial M/\partial t > 1$. We described the kinematics of example real-world networks where the proposed nomenclature was used: (1) The collaboration network of Filipino Computer Scientists; (2) The network created from friendship relations among Batangas and Laguna Facebook users; and (3) The network created from the followed-follower relations among the top ten globally influential Twitter users.

keywords: Network kinematics, nomenclature, standard linguistic description

*Contributed abstract to the **Contributed Abstract to the 2015 Mathematical Society of the Philippines Annual Convention**, Plaza del Norte Hotel and Convention Center, Laoag City, 18-19 May 2015.