

AKSOE 11: Social-, Information-, and Production Networks I

Time: Wednesday 13:00–14:30

Location: EW 203

AKSOE 11.1 Wed 13:00 EW 203

The Backbone of Control in G8 Countries — ●JAMES GLATFELDER, STEFANO BATTISTON, and FRANK SCHWEITZER — Chair of Systems Design, ETH Zurich, Switzerland

Starting from a network of shareholding relationships of quoted companies in G8 countries, the question of the distribution of control is addressed. The special nature of such complex networks — the orientation and weights of links — is taken into account by introducing new statistical measures which allow the identification of shareholders cumulatively controlling a substantial fraction of the market. The backbone of control, this clique of powerholders and their portfolios, is further analyzed using appropriate metrics unveiling distinct characteristics of the nature of the core of the G8 markets.

AKSOE 11.2 Wed 13:30 EW 203

Networks of tag co-occurrence and measures of relatedness in social tagging systems — ●CIRO CATTUTO^{1,2}, DOMINIK BENZ³, ANDREAS HOTH³, GERD STUMME³, and ANDREA BALDASSARRI⁴ — ¹Centro Studi e Ricerche “Enrico Fermi”, Compendio Viminale, 00184 Roma, Italy — ²Complex Networks Lagrange Laboratory (CNLL), ISI Foundation, 10133 Torino, Italy — ³Knowledge & Data Engineering Group, University of Kassel, 34121 Kassel, Germany — ⁴Phys. Dept., Università di Roma “La Sapienza”, P.le A. Moro 2, 00185 Roma, Italy

Social tagging systems allow web users to organize and share resources by associating them with free-form keywords (*tags*). The popularity of these systems has surged to a point where their study is important both for scientific and technological reasons. Their underlying data structures are hypergraphs (known as *folksonomies*) collaboratively built by the unsupervised activity of users: understanding their structure and evolution poses promising challenges in different fields of research. Crucial concepts are those of tag (node) similarity and tag (node) re-

latedness. We show that a bridge can be developed between statistical measures of tag relatedness in the folksonomy and standard notions of taxonomic distance in formal representations of knowledge. We use data from the social bookmarking system *del.icio.us* to analyze three distributional measures of tag relatedness (tag co-occurrence, cosine similarity and FolkRank, an adaptation of PageRank to folksonomies) and provide a solid semantic grounding of our findings by mapping the nodes of the folksonomy hypergraph into a large taxonomic database of English, and applying there standard measures of semantic similarity.

AKSOE 11.3 Wed 14:00 EW 203

K-core structure of folksonomies — ●ANDREA BALDASSARRI¹, CIRO CATTUTO², and VITTORIO LORETO^{1,3} — ¹Sapienza Università di Roma, Rome, Italy — ²Centro Studi e Ricerche “Enrico Fermi”, Rome, Italy — ³ISI Foundation, Turin, Italy

Collaborative tagging systems have become very popular on the web. In these systems, users collect and share information annotating resources with freely chosen keywords (“tags”), that can be used to browse the annotated information. The emergent data-structure (“folksonomy”) can be described as a tri-partite network of users, tags and resources. Each time a user annotates a resource with a tag, a hyper-link is added to the network, which then undergoes a decentralized, unsupervised growth. Previous investigations focused on the structure of the network, revealing its small-world nature and spotting specific correlations encoding semantics. Here we explore the topological structure of the network and we investigate the existence of cores of highly connected nodes. We characterize such cores and interpret their member nodes in terms of measures of semantic relatedness. The study requires the introduction of some methodological novelty in order to define tools and measures suitable for the specific nature of folksonomies.