Call for Participation

IJCAI-2015 Workshop

3rd Workshop on Heterogeneous Information Network Analysis (HINA)

Organizing Committee

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Technical Description of Workshop

Recent work on heterogeneous information networks (HIN) has led to a convergence of methodologies for network modeling, incorporating community detection, centrality and importance measures, frequent subgraph mining, techniques learning and reasoning with graphical models of probability, relational representation, and link mining, among other. Many intelligent systems applications to predictive analytics, user modeling, recommender systems, information retrieval, and information extraction call for inferences to be made regarding the existence, type, or attributes of links. Some tasks, such as question answering and knowledge base population using **information networks**, may require that inferences be based upon partial link information and made under uncertainty about participating entities and relationships.

Active research areas that are relevant to heterogeneous information networks include:

- detecting important nodes and relationships
- information propagation in networks (sensitive information, trust networks)
- community detection and formation modeling
- ranking-based clustering methods: learning to rank in information networks
- path-based similarity measures and relationship extraction
- applications to modeling of weblogs, social media, social networks, and the semantic web
- frequent pattern mining in graph and sequence data

The emphasis of this workshop shall be approaches based on relationship extraction from heterogeneous sources such as social media and other online text sources. Relevant media include, but are not limited to, forums, blogs, systems such as Twitter, YouTube, Facebook, Google+, LinkedIn, Pinterest, Tumblr, *etc.* Of particular interest are sharing mechanisms, status updates, systems for rating and commenting, and embedded content in the deep web, including images and video. However, the scope is not limited to any particular approach to link analysis or any source of network information such as text corpora. Application areas that often exhibit a need for heterogeneous information network analysis include:

- **information diffusion and sharing systems:** activity networks, social media (opinions and sentiments, meme propagation, viral content, political commentary, *etc.*)**,** sensor networks
- **behavioral modeling:** geospatial domains, community recruitment and mass activity, large-scale patterns, traffic, spatiotemporal effects
- **social recommender systems:** communities, experts, vendors, products, information sources
- **application areas:** forensics (network-based criminology), event detection from news, free text technical literature, cybersecurity (information flow, trust networks, attack graphs, mechanism design), bioinformatics and biomedicine (genomics, proteomics, metabolomics), epidemiology

This workshop shall help to bring together people from these different areas and present an opportunity for researchers and practitioners to share new techniques for identifying and analyzing relationships in networks that integrate multiple types or sources of information.

Intended Audience and Impact

This workshop is intended for researchers and practitioners in information systems that can be modeled using networks that exhibit some heterogeneity (*i.e.*, differentiation among the entities and potential relationships represented by graphical elements). Examples of such heterogeneous information networks include community graphs with roles such as moderators and members, including models of social media that differentiate content providers, critics, and consumers; graphs of web pages that are annotated with paths and relationship strength indicators; and blogs and tweets with links or co-occurrence data.

Analyzing heterogeneous information networks involves the application of diverse new approaches from information extraction and integration, graph theory and algorithms, machine learning, topic modeling, knowledge representation, and uncertain reasoning. Researchers with interests in big data, social media, knowledge discovery in databases, cyber-physical systems, and informatics will also find this workshop of interest. In particular, prominent challenges exemplified by real-world problems in this area include how to account for and make use of behavioral patterns (including some large to colossal patterns), social dynamics including information propagation, relational characteristics, organizational structure, dynamic topic modeling, and concept drift.

We welcome paper submissions from researchers in all areas of heterogeneous information networks listed in the above section describing the workshop scope. We also hope to attract IJCAI participants from industrial R&D with interesting current applications that showcase aspects of heterogeneity in social and other networks.

Workshop Logistics

The workshop will be a single-day event featuring morning and afternoon technical sessions. In the spirit of fostering new research and collaboration, care will be taken to maximize available time for discussions and questions. The program committee will aim at accepting about 8-10 technical papers for full oral presentation.

Following brief welcoming remarks, a 3-hour morning session will consist of approximately half the oral technical presentations. A single invited talk following the lunch break will be aimed at serving the interests of a variety of intelligent systems researchers and attracting new researchers to the topic of heterogeneous information networks. The afternoon session will include the second half of the technical papers, concluding early with an optional poster session and a brief open discussion about possible special issues of journals on the topic. The goal of both concluding sessions is to provide additional opportunities for cross-fertilization between academic and industrial research, through introduction of applications and methodologies that may otherwise be unfamiliar to participants in diverse areas.