REPUBLIC OF MACEDONIA
Ss. Cyril and Methodius University in Skopje
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Final project proposal

Type	Master
Title	***Inferring network structure***
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Topic(s)	
network science	
Project can start from	Any period between 01.04.2014 – 01.03.2015
Project duration	4 months
Short description	
Objective: To develop unsupervised/supervised algorithms for network identification Work description: First, in the case of unsupervised network identification, graph representations shall be used for dealing with structural information in different domains. An important approach will be to identify the key members in an organization by computing the so-called centrality measures. A directed graph (digraph) model shall be employed to study the centrality measures, such as the degree, betweenness and closenesss. Probabilistic graph models, such as Holland-Leinhardt model, the p* model, and Markov random graphs will be used to infer whether there exists a link (edge) from a node i to another node j. Holland-Leinhardt model is an a posteriori blocking procedure in the framework of the exponential family. The p* model is a simplified Markov random graph with binary attributes. In this model, the network identification problem reduces to one of estimating the adjacency matrix associated with the digraph via a maximum likelihood technique. Next, given a library of hypothesized networks, supervised network identification is a more realistic alternative to unsupervised network identification. A general graph model, termed an Attributed Relational Graph (ARG), composed of multi-attributed nodes and multi-attributed links (edges), will be used in pattern recognition and graph matching. In order to achieve good correspondence (association, matching) between two attributed relational graphs, measures that adequately represent the similarity between the attributes of nodes and the similarity between attributes of edges will be defined.	
Results and assessment	
Journal/conference paper	
Other (additional) information	
http://www.cs.manu.edu.mk/people/faculty/ljupco-kocarev	