

## **Příloha 6: Posudek oponenta habilitační práce**

**Masarykova univerzita**

**Fakulta** Fakulta informatiky

**Habilitační obor** Informatika

**Uchazeč** Parag Kulkarni, Ph.D., D.Sc.

**Pracoviště** Fakulta informatiky

**Habilitační práce** Knowledge Management and New Paradigm of Advanced Machine Learning

**Oponent** Prof. Ing. Petr Berka, CSc.

**Pracoviště** KIZI FIS VŠE v Praze

### **Text posudku (rozsah dle zvážení oponenta)**

The habilitation thesis of Mr. Parag Kulkarni “Knowledge Management and New Paradigm of Advanced Machine Learning” deals with an important issue of computer science. The applicant submitted a “set of previously published scientific works or engineering works with commentary” that should show his research activities in the area of knowledge management and machine learning. To be more specific in nine areas listed in the introduction to the thesis ranging from various aspects of semi-supervised and unsupervised machine learning over machine learning applications to intrusion detection or text classification to intelligent decision making and knowledge management (page 4). Having this in mind, I must say, that the selection of papers (at least according to the list of publications in Dr. Kulkarni’s CV) could be better. None of the submitted papers is related to the area of knowledge management, and also the paper 7 (the application for an US patent) could be substituted by a more “scientific” contribution.

Let me briefly comment the papers that compose the habilitation thesis. Publication 1 is a survey paper in a conference proceedings that reviews different approaches to semi-supervised learning. Publication 2 (journal paper) presents a novel algorithm of clustering high-dimensional data based on automated identification of lower dimensional subspaces using a hierarchical (bottom-up) approach. Publications 3 (conference paper) and 4 (journal paper) present a novel method of load balancing in distributed networks. Publication 5 (journal paper) describes an application of self-organizing map (SOM) for intrusion detection. Publication 6 (journal paper) compares various soft computing techniques for the problem of emotional recognition based on facial and audio features. Publication 7 is a patent of a method of document classification based on both textual and image features. The conference paper (publication 8) briefly introduces a new method of decision making based on mind-maps. Publication 9 (journal paper) describes an incremental algorithm for decomposition (reduction) of the feature space for classification tasks.

The thesis shows the ability of Dr. Kulkarni to carry out scientific work in the field of computer science on an internationally acknowledged level, it shows his ability to elaborate, present and disseminate new ideas. The habilitation thesis fulfill all the requirements given on such type of work and I recommend the thesis for defense.

## Dotazy oponenta k obhajobě habilitační práce (počet dotazů dle zvážení oponenta)

1. Semi-supervised learning is not the only approach to machine learning that uses both labeled and unlabeled examples. Another area is active learning, where the algorithm also tries to get labels for previously unlabeled examples. Where do you see main similarities and differences between these approaches?
2. What is the main innovative aspect of the patent, publication 7 in the thesis?

## Závěr

Habilitační práce Paraga Kulkarniho „Knowledge Management and New Paradigm of Advanced Machine Learning“ *splňuje* požadavky standardně kladené na habilitační práce v oboru Informatika.

Praha, .....26.9.2012.....

  
prof. Ing. Petr Berka, CSc.