Posudek *oponenta** diplomové práce

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Název práce: Towards concept visualization through image generation

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<u>Vlastní text</u> :

Description:

The goal of this thesis was to develop a software system that turns an input word into an image depicting the meaning of a word. For instance, given the word "car", the system should generate an image of a car.

The presented solution is decomposed into three steps. First, a vector-space representation of an input word is created. Second, this representation is transformed into a vector-space representation that is more appropriate for representing images. Third, a bitmap image is generated from the latter representation.

The thesis is written in English. Its total length is 60 pages and it follows the standard structure for an experimental work (introduction, literature review, description of the introduced solution, experiments, conclusion, bibliography, appendices). There is no data carrier attached to the thesis.

Evaluation:

I don't recommend the thesis for the defense. In my opinion the amount of the student's own research work and the presentation quality don't match the standards of our faculty.

I am neutral to the ambitious central hypothesis that images of previously unseen entities can be created just from their word vector representations. It goes beyond my expectations, but don't feel qualified to agree or disagree with that.

I also do not criticize the fact that this hypothesis is far from being verified by the experiments documented in the thesis. The problem might be too difficult to solve within a master thesis, or there might be too strong assumptions already in the thesis specification, and one can hardly avoid bad luck in making design decisions too.

I even don't criticize author's optimism when he faces obviously negative evidence (honestly, I find the generated images impossible to decode by a human eye). However, there should be some limits. For example the sentence '*our system has an ability to project a word vector of "car" onto visual feature space and then reconstruct the image of a "car" without having eve seen any photo of "car"* ' (p.6) is simply not true, as the presented system has no such ability. But let's consider such claims just as a residue of wishful thinking during writing the introduction and let's believe the author just forgot to delete them.

The most important reasons that led to my negative overall evaluation are the following:

a) The problem analysis seems to be too shallow. For instance, the literature review is extremely simplified (see e.g., the overview of semantics in NLP, p.8); error analysis which says that the system captures only dominating colors and not shapes, because '*there is often a lack of expressions about shape in linguistics*' is quite misleading (in fact, representing the dominating color in an image of a word could be reached via radically simpler ways).

b) Presentation of the results is not detailed enough from the scientific point of view. There are almost no technical/implementation details. No data sets or developed tools created during the experiment are attached to the thesis. The conditions of the manual evaluation are not specified clearly, and thus the performed experiments are irreproducible. There is no baseline solution used for comparison purposes, so any claims about the evaluation results are inconclusive.

c) My most important point is a simple one: I don't think enough work was done. The thesis is full of borrowed material (however, the credit is carefully reported, which I appreciate). The two core chapters that should describe main contributions are really short: without borrowed material they contain just some 15 or 16 pages altogether.

Let me mention also some positive aspects. The overall language quality is good and it seems that some sections went through careful language proof-reading. The typesetting quality is also relatively good (however, there are still numerous imperfections remaining in the text; I am ready to provide the author with their list).

<u>Doporučení k obhajobě:</u>

Z výše uvedených důvodů práci *nedoporučuji** k obhajobě.

Vynikající práce vhodná pro soutěž studentských prací	ANO ☐

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V Praze dne: 27. ledna 2016

Podpis:**

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