Recommendation for the defense of Ph.D. thesis

Ph.D. candidate: **Mirko Hannemann**
advisor: **Lukáš Burget**

I am happy that Mirko Hannemann has submitted his thesis under my supervision, and that his long-years efforts have converged to this day.

Mirko's thesis deals with the important problem of hypothesis decoding in automatic speech recognition (ASR) and introduces several methods to increase the efficiency of the decoding, which are sound from the theoretical point of view and also verified experimentally. Mirko has worked on these approaches at BUT, at Johns Hopkins (with Dan Povey) and during stays at Microsoft Research (mainly with Jasha Droppo) and I am happy he managed to consolidate his findings into a document that I (and the reviewers) consider very valuable to the community.

The thesis however covers only part of Mirko's activities. During BUT's participation in the European **FP7 DIRAC** project (2006-10, coordinated by Hynek Hermansky), Mirko and Stefan Kombrink were responsible for the research on discovery and handling of Out-Of-Vocabulary (OOV) words in the output of ASR. They came up with series of OOV detectors based on different classifiers, and devised strategies to handle re-occurring OOVs, convert them into strings of sub-word units, and finally convert to words. This work contributed to the success of DIRAC project.
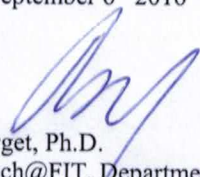
After DIRAC, Mirko was instrumental for BUT's participation in the **IARPA Babel** program and, in cooperation with Martin Karafiat, Franta Grezl, and others, significantly contributed to the success of BUT systems and features in the "Babelon" consortium and to our excellent results in Babel project.

Mirko was also active pedagogically - besides teaching (the usual set of signals and systems and speech processing), he led the successful Bc. and MSc. theses of Karel Beneš.

From personal point of view, I appreciate Mirko's sense of responsibility and availability – he has always been available for help in case anyone needed to dig deep into weighted finite state transducers and operations thereon. He has also been one of the key contributors to the KALDI toolkit, that is nowadays immensely popular in the ASR community. I also appreciate his volunteer activities, reaching far beyond his work in the speech research, and his deep interest in and excellent command of Czech.

To conclude, **I fully recommend Mirko Hannemann's Ph.D. thesis for the defense**, I am wishing him all the best in his future job at RWTH Aachen and personal life, and I am looking forward to future cooperation with him.

In Brno, September 6th 2016

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