Recommendation for the defense of Ph.D. thesis

Ph.D. candidate: Murali Karthick Baskar
advisor: Lukáš Burget

I am happy that Karthick has finished his thesis under my supervision, and that his long-years efforts have converged to the submission of doctoral dissertation at FIT. The thesis is at the intersection of speech processing and machine learning and deals with the important problem of never enough data for training practical automatic speech recognition (ASR) systems, mainly in the area of heterogeneous training data with very little classical annotated resources.

Karthick excelled in all aspects of scientific work, from the detection and exploration of new research paths, through careful experimentation, coding and experimental setup to publications. His publication track is impressive and he has Google Scholar h-index 12, better than many seniors in our field. The 2018 paper “Multilingual sequence-to-sequence speech recognition: architecture, transfer learning and language modeling” he co-authored has already gained 108 citations according to Google Scholar. His work on “Residual Memory Network” brought him and Karel Benes the Best student paper award at INTERSPEECH 2017 in Stockholm.

Karthick worked on a number of projects including high profile ones, such as IARPA Babel, DARPA Lorelei, and Humane-AI Net, a European research AI initiative bringing together top European research centers, universities and key industrial players into a network of centers of excellence. He worked on the Humane-AI Net micro-project undertaken in cooperation with TU Berlin focusing on dysarthric speech recognition, with a very limited amount of fine-tuning data.

He has shown flexibility in collaborating with multiple projects and different teams. His joint research with Dr. Shinji Watanabe (ex. Johns Hopkins University, now Carnegie Mellon University, USA) has resulted in multiple research works during JHU workshop 2018 in Baltimore. He was also an intern in Google in 2021, the quality and appreciation of his work brought him the current position with this company.

Evaluations and challenges are key activities helping our lab to advance its know-how and assess objectively where we stand in the state-of-the-art. Karthick participated in ASR evaluations within the above-mentioned US projects, leading to our team’s excellent results and to significant funding of BUT from DARPA and IARPA. In 2018, he took part in the BUT team participating in “Low resource Indian language ASR challenge”, organized by Microsoft India, involving building speech recognition systems on three Indian languages. The BUT team won the challenge.

He was also active pedagogically - he taught labs of Signals and Systems (Bc), Speech Signal Processing (Masters) and Classification and Recognition (Masters). He also provided newcomers in the lab with instruction on tools, data, ASR systems, SGE computing and many others.

He organized our trip to Chennai and Bangalore prior to the INTERSPEECH 2018 event and had helped to establish and strengthen the academic collaborations between top Indian universities and BUT. He regularly works for the community - he regularly shares his expertise as a technical reviewer, associate editor, and area chair for various top-ranked journals and conferences.

From a personal point of view, I appreciate Karthick's perseverance, analytical and experimental skills, sense of team-work, and good will to make the lab a happy place to work.

To conclude, **I fully recommend Murali Karthick Baska's Ph.D. thesis for defense**. I wish him all the best in his professional and personal life, and look forward to being in touch with him in his current Google Inc. position.

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