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Dean
Prof. Ing. Zdeněk Plíva, Ph.D
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Letter of Recommendation for the Promotion of Zbyněk Koldovský

Dear Prof. Plíva,

I write you to confirm my very strong support for the promotion of Doc. Zbyněk Koldovský to the title of Professor at the Technical University of Liberec, Faculty of Mechatronics, Informatics and Interdisciplinary Studies. I have more than thirty years of experience in the field of acoustic signal processing and blind source separation. I am a Professor of University of Tsukuba, Japan. I am an IEEE Fellow, member of the Board of Governors of the IEEE Signal Processing Society (SPS), member of the international ICA steering committee, having previously served as an IEEE Distinguished Lecturer and the chair of the Technical Committee on Audio and Acoustic Signal Processing (AASP) of SPS, being the chair of a number of conferences and workshops in the area of AASP and ICA. In these roles, I am well placed to observe the contribution of many researchers to the field. I believe that Doc. Koldovský is among the top researchers in this area.

I have known Doc. Koldovský for more than a decade. We met at numerous international conferences dedicated to (audio) signal processing and machine learning where he presented his works. I am fully aware of his scientific achievements and his contributions to our field and to our community.

The publication record of Doc. Koldovský is very impressive, both in quantity and quality. He has published 14 papers in internationally refereed top-flight scientific journals of IEEE and more than 70 papers on international peer-reviewed conferences. It is worth noting that these works, written together with a relatively small group of co-authors, have already attracted a large number of citations (h-index 20 and i10-index 34, Google Scholar).

I will try to give my perspective on the main research outcomes of Doc. Koldovský. He is a significant contributor to the field of Blind Signal Separation (BSS), especially, to the methodology based on Independent Component Analysis (ICA). He has developed several ICA algorithms which are very strong in terms of accuracy and speed. These methods have been applied in various fields beyond signal processing (image processing, biomedical applications, machine learning, astronomy, etc.), which highlights their high impact. Also, his interest has been focused on performance bounds of BSS given by the Cramér-Rao theory. These bounds bring important contributions to the understanding of mathematical models that are widely used in BSS.

Doc. Koldovský has been also very active in applications of BSS in audio signal processing. He has proposed a successful general-purpose time-domain algorithm for audio signal separation and BSS-based methods for speech enhancement. In recent years, he has published several pioneering works dedicated to methods that exploit low-rank models of separating audio filters. His research group is also contributing in area of semi-blind methods that try to incorporate partial knowledge about mixing conditions in order to increase the robustness of BSS.

The most recent research of Doc. Koldovský has been focused on Blind Source Extraction where, compared to BSS, only a particular source should be extracted from mixed signals. Several interesting contributions of his group, including Cramér-Rao bounds and practical algorithms, have been already published at leading conferences, and several journal articles are in preparation. This indicates an impressive activity growth of the research group (ASAP), which has been established at the Faculty of Mechatronics, Informatics and Interdisciplinary Studies in 2016.

Doc. Koldovský is known to me also due to his contribution to our scientific community. In 2011 and 2012 he served as a member and the co-chair of the committee of the SiSEC evaluation campaign, respectively; research reports of these campaigns have already received 188 citations in Google Scholar. In 2015, he was the general co-chair of the 12th Conference on Latent Variable Analysis and Signal Separation (LVA/ICA 2015) in Liberec. Since 2015, he has been a senior member of IEEE. He was also co-organizing two special sessions at EUSIPCO in 2015 and 2017, where EUSIPCO is one of the major conferences in the signal processing field. In 2018, he served as a technical co-chair of the 16th International Workshop on Acoustic Signal Enhancement (IWAENC 2018) in Japan. Last but not least, he has served as a reviewer of hundreds of articles in several leading journals and conferences.

Based on the above, I can clearly state that Doc. Koldovský is one of the leading scientists in our field. He has already made a significant impact on

our research community. I strongly support his promotion to the title of Professor.

Sincerely yours,

Shoji Makino
Professor, University of Tsukuba