Supervisor statement for doctoral thesis of MUDr. Dominik Škrabal

MUDr. Dominik Škrabal received his M.D. at the First Faculty of Medicine of Charles University. He started his postgraduate research officially in September 2019, but his research interest in neurological diseases in my group started during his early undergraduate studies.

During the PhD study, Dominik Škrabal built up his knowledge in speech and neuroscience and focused on research on evaluating motor speech disorders by objective acoustic analysis, particularly concerning vowel articulation impairment. The main goals of the thesis were to explore the potential of vowel articulation in comparison with other measures of speech dysfunction as a surrogate biomarker of α-synucleinopathies. To achieve these goals, Dominik Škrabal analysed speech data from patients with rapid eye movement sleep behavior disorder, a special case of prodromal Parkinson's disease, de-novo Parkinson's disease, advanced Parkinson's disease, atypical parkinsonian syndromes, and other progressive neurodegenerative diseases, as well as healthy control speakers.

Dominik Škrabal's activities covered several interdisciplinary domains of clinical neurology, acoustic speech analyses, and clinical linguistics. His work has brought significant progress in understanding the mechanisms of speech disorders in parkinsonism. The approaches to analyse speech proposed by Dominik Škrabal are original and innovative, and their practical applications are beneficial in diagnosing and monitoring neurodegenerative diseases. These methods not only help to detect disease earlier before diagnosis but also to differentiate between patients with Parkinson's disease and atypical parkinsonian syndromes. Thus, the knowledge originating from the submitted PhD thesis might provide novel biomarkers to measure disease progression and treatment response.

The results of Dominik Škrabal have been published in four peer-reviewed scientific papers in international journals, where he is the first author of two. One of these, npj Parkinson's Disease from Nature's portfolio, is a significant journal in the field with an IF = 8.7 and is the first decile in the neuroscience category. All remaining papers are published in first or second-quartile journals. In the remaining two papers, he is the second and third author, where he significantly contributed by analyses and interpretation of results. He received awards for both of his first-authored studies: 1st Prize of the Henneruv nadační fond for outstanding journal publication in 2021 and Czech Neurological Society prize for outstanding original research for young authors in 2023. His papers have been cited several times with 13 WoS citations (excluding self-citations) and current H-index = 3. Dominik Škrabal was also actively involved in the solution of two research grants by the Czech Ministry of Health (AZV) as a part-time researcher. Outside of PhD topic, he participated in a multicentric study on language markers of phenoconversion and published one paper as a co-author in the Annals of Neurology journal. Given the above-mentioned achievements, the submitted doctoral thesis was designed as a collection of papers.

To sum up, the results of the submitted Ph.D. thesis are clearly outstanding as they have passed through rigorous reviewing in four respected international journals with significant IF. The subject of the thesis is clearly relevant to the current needs of the scientific community. The submitted work is important for the further development of science.

MUDr. Dominik Škrabal has been approved to be capable of independent creative scientific work, and therefore, I highly recommend his doctoral thesis for defense.

In Prague, December 7th 2023,

Doc. Ing. Jan Rusz, Ph.D.
Supervisor