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## Speech attributes estimation (Intelligibility, Quality, and Loudness) and Speech Enhancement using Machine Learning Algorithms

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## **Vahid Ashkanichenarlogh**

According to Speech-Language and Audiology Canada, hearing impairment is the third most common chronic disability observed in older adults. Hearing Aids (HAs) form the most common rehabilitation option for a majority of hearing loss configurations. The performance of HAs in challenging noisy and reverberant environments, and the measurements of HA speech intelligibility, speech quality, and loudness are of paramount importance for clinical Audiologists, hearing aid researchers and development engineers. My research addresses these issues and endeavours to make the following contributions: (a) development and validation of a multi-task machine learning model that can simultaneously predict the intelligibility, quality, and loudness from the HA output alone; (b) development and validation of a machine learning model that enhances speech in challenging communication environments; and (c) implementation of the developed speech enhancement model within a portable assistive hearing platform, and its evaluation by listeners with hearing loss.