Master Thesis title / MAL izenburua
Fundamental Frequency Restoration Using Deep Learning.

Proposer(s) / Proposatzailea(k): names / izenak

Eva Navas / Inma Hernáez/

Contact / Kontaktua: eva.navas@ehu.eus

Description / Deskribapena

Fundamental Frequency Restoration Using Deep Learning. One of the biggest problems in esophageal voice production in laryngectomized patients is the lack of pitch or frequency fundamental that produces unnatural signals. Applying techniques of Voice conversion can improve the quality of your voices [1] [2], but the absence of fundamental frequency is a problem that persists in converted signals limiting their quality. Generative networks antagonists (Generative Adversarial Networks, GANs) have been applied successfully converting whispered voice (lacking frequency fundamental) to voiced voice [3]. In this paper it is proposed to explore these techniques based on deep learning to restore frequency fundamental in sound signals that have been eliminated the fundamental frequency information in advance, as a first step to obtain a valid pitch restoration system for patients laryngectomized. To do this, it is proposed to apply the architecture available at [4].

1] Doi, H., Nakamura, K., Toda, T., Saruwatari, H., & Shikano, K. (2010). Esophageal speech enhancement based on statistical voice
conversion with Gaussian mixture models. IEICE TRANSACTIONS on Information and Systems, 93(9), 2472-2482.
[2] Serrano, L., Tavarez, D., Sarasola, X., Raman, S., Saratxaga, I., Navas, E., & Hernaez, I. (2018). LSTM based voice conversion for laryngectomees. In IberSPEECH (pp. 122-126).
[3] Pascual, S., Bonafonte, A., Serrà, J., & Gonzalez, J. A. (2018). Whispered-to-voiced alaryngeal speech conversion with generative
adversarial networks. arXiv preprint arXiv:1808.10687. https://arxiv.org/pdf/1808.10687.pdf
[4] https://github.com/santi-pdp/segan_pytorch

Goals / Helburuak

Goals here

Requirements / Betebeharrak

Knowledge of programming high-level programs (Python, scripting). Motivation and interest to innovate and solve problems. Capacity for teamwork.

Framework / Esparrua

Tasks and plan / Atazak eta plana

Tasks and plan here if needed