BENCE MARK HALPERN

Designated Assistant Professor, Nagoya University

Hungarian (native) English (C2) Japanese (B2) Dutch (B1)
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INDUSTRY AND RESEARCH EXPERIENCE

Designed Assistant Professor

Nagoya University

Oct 2023 - Ongoing — Nagoya, JP

- **Supervisor**: Prof. Tomoki Toda
- Work funded by Nagoya University on developing future pathological speech based systems, focusing on post-operative speech prediction

Researcher

Netherlands Cancer Institute

Oct 2022 - Ongoing — Amsterdam, NL

- **Supervisor**: Prof. Michiel van den Brekel, Dr. Rob van Son
- Conducting research on assistive speech technology for oral cancer speakers, leading data collection for prospective studies

Postdoctoral Researcher

Nagoya University

Oct 2022 - January 2023 — Nagoya, JP

- **Supervisor**: Prof. Tomoki Toda
- Worked on pathological speech synthesis, secured funding for the position through personal resources

Early Stage Researcher (PhD student)

Netherlands Cancer Institute, University of Amsterdam, Delft University of Technology

July 2018 - Oct 2022 — Amsterdam, NL

- **Supervisors**: Prof. Michiel van den Brekel, Dr. Odette Scharenborg, Dr. Rob van Son
- **Funding**: TAPAS Marie Curie European Research Council program
- Worked on various pathological speech technology applications which resulted in more than 10 publications
- Experience with ethical approvals and speech data collections in the Netherlands
- Published publically available YouTube-based spontaneous oral cancer dataset
- Developed open-source software for articulatory synthesis, articulatory inversion, error analysis of word-level ASRs

Machine Learning Research Consultant

Oxford Wave Research Ltd.

July 2019 – September 2023 — Oxford, UK

- Developed a noise-robust fake (spoofed) speech detector, resulting in a publication (B. Halpern, Kelly, et al. 2020; B. Halpern and Kelly 2022)
- Finished working on a speaker embedding-based speech enhancement project resulting in a publication (B. M. Halpern, Kelly, and Alexander 2021)
- Experience with developing speech technology projects for security-sensitive environments

Intern

IDIAP

June 2020 – Aug 2020 — Martigny, CH

- **Supervisor**: Dr. Mathew.-Magimai Doss
- Developed open-source software for voice conversion and carried out research on synthesising dysarthric speech (B. M. Halpern, Fritsch, et al. 2021)

Computer Vision Intern

BECOCO Ltd.

July 2017 – Sept 2017 | London, UK

- Developed a fashion object detection pipeline with over 90% accuracy for fashion reccommendation applications
- Worked towards tight deadlines in a fast-paced London startup (backed by Innovate UK 4 times), finishing four project deliverables under two months using Python and MATLAB

Undergraduate Researcher

Imperial College London

July 2015-July 2016 | London, UK

- Worked on a blood oxygene control software fault happening in high blood pressure readings, which is currently used as an assistive technology in the National Health Service (UK Public Healthcare)
- Created a CT image processing pipeline which improved segmentation of ribs for an ultrasound treatment plan using computer vision techniques in MATLAB

TEACHING EXPERIENCE

- Two-time co-lecturer of the course **Speech Synthesis-and recognition** at the University of Amsterdam, Netherlands with Prof. Paul Boersma (*developer of Praat*, *UvA*). Explained end-to-end approaches to speech technology and received 7.2 on teaching performance. (266 hours)
- Guest lecture on **End-to-end ASR systems** for the **Dialogue, speech and language processing course** of Dr. Svitlana Vakulenko (*Amazon Alexa*) (10 hours)
- Organised **ASR Deep Learning Workshop** for 15 PhD students during the TAPAS (Training in the Automatic Processing of PAthological Speech) Training Event 2 with Thomas Rolland, Zhengjun Yue and Dr. Thomas Pellegrini (*IRIT*) (10 hours)
- Undergraduate Teaching Assistant of **Programming II** workshop at Imperial College London where I helped students with C++ assignments and understanding of objected oriented programming concepts (50 hours)
- Supervised 9 MSc students from diverse backgrounds during my PhD, several of them resulting in publications at top conferences (Illa et al. 2021; Prananta et al. 2022; Monen et al. 2022; Wildenburg et al. 2022)

EDUCATION

MSc in Biomedical Engineering (Electrical Engineering Major)

Imperial College London

Sep 2014 - July 2018 | London, UK

- Written thesis on an Optimal Experiment Design framework for Bayesian Identification of Genetic Regulatory Networks supervised by **Dr. Guy-Bart Stan** and **Dr. Zoltan Tuza**
- Taken courses in Information Theory, Pattern Recognition, Adaptive Signal Processing, Image Processing, Control Theory and Computer Vision to obtain fundamental machine learning and digital signal processing knowledge
- As President of Imperial College Hungarian Society organised medium-sized events (10-80 people) and secured sponsorship from Hungarian State

PROGRAMMING SKILLS

Programming Languages	Frameworks	Scripting
Python	PyTorch	Praat
MATLAB	Keras	R
bash/shell	Kaldi	LaTeX
C++	ESPNET	HTML
Java	Tensorflow	CSS

OTHER ACTIVITIES

- **Eurovision AI Song Contest**: Member of Can AI Kick It team responsible for the singing voice synthesis in our team where I worked together with the Dutch rapper *Willie Wartaal*. Our submission is accompanied by a web series.
- Statistically analysed the language use of Hungarian students at UK and Hungarian university campuses, supervised by Dr. Eszter Tarsoly (*UCL*)
- Member of International Speech Communication Association (ISCA) (2019-Ongoing)
- **Reviewer** at
  - IEEE Transactions on Speech, Audio and Language Processing (2021)

- ITG Speech Communications (2021)
- Interspeech (2021)
- Universal Access in the Information Society (2021)
- IEEE Access (2022)

LIST OF PUBLICATIONS

Peer-reviewed journal papers

- Feng, Siyuan et al. (2024). “Towards inclusive automatic speech recognition”. In: *Computer Speech & Language* 84, p. 101567.
- Halpern, Bence Mark, Siyuan Feng, et al. (2023). “Automatic evaluation of spontaneous oral cancer speech using ratings from naive listeners”. In: *Speech Communication* 149, pp. 84–97.
- Tienkamp, Thomas B, Rob JJH van Son, and Bence Mark Halpern (2023). “Objective speech outcomes after surgical treatment for oral cancer: An acoustic analysis of a spontaneous speech corpus containing 32.850 tokens”. In: *Journal of Communication Disorders* 101, pp. 106–292. DOI: 10.1016/j.jcomdis.2022.106292.
- Halpern, Bence Mark, Siyuan Feng, et al. (2022). “Low-resource automatic speech recognition and error analyses of oral cancer speech”. In: *Speech Communication* 141, pp. 14–27. DOI: 10.1016/j.specom.2022.04.006.

Peer-reviewed conference papers

- Halpern, Bence and Finnian Kelly (2022). “Can DeepFake voices steal high-profile identities?” In: *IAFPA 2022*.
- Huang, Wen-Chin et al. (2022). “Towards identity preserving normal to dysarthric voice conversion”. In: *ICASSP 2022-2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE, pp. 6672–6676.
- Monen, Janay et al. (2022). “Automatic Detection and Speech Severity Estimation for Oral Cancer Speech”. In: *Young Female Researchers in Speech Workshop 2022*.
- Prananta, Luke et al. (2022). “The Effectiveness of Time Stretching for Enhancing Dysarthric Speech for Improved Dysarthric Speech Recognition”. In: *Interspeech 2022*. DOI: 10.21437/Interspeech.2022-190.
- Rebernik, Teja et al. (2022). “The effect of masking noise on oral cancer speech acoustics and kinematics”. In: *Speech Motor Control 2022*.
- Tienkamp, Thomas, Teja Rebernik, Bence Halpern, et al. (2022). “Quantifying changes in articulatory working space following oral cancer treatment using electromagnetic articulography”. In: *Speech Motor Control 2022*.
- Wildenburg, Kirsten et al. (2022). “Automatic Speech Recognition and Error Analyses of Dutch Oral Cancer Speech”. In: *Young Female Researchers in Speech Workshop 2022*.
- Zhang, Yuanyuan et al. (2022). “Mitigating bias against non-native accents”. In: *Interspeech 2022*, pp. 3168–3172. DOI: 10.21437/Interspeech.2022-836.
- Halpern, Bence Mark, Julian Fritsch, et al. (2021). “An objective evaluation framework for pathological speech synthesis”. In: *Speech Communication; 14th ITG Conference*. VDE, pp. 1–5.
- Halpern, Bence Mark, Finnian Kelly, and Anil Alexander (2021). “Speaker-informed speech enhancement and separation”. In: *IAFPA 2021*.
- Illa, Marc et al. (2021). “Pathological voice adaptation with autoencoder-based voice conversion”. In: *11th ISCA Speech Synthesis Workshop*. ISCA, pp. 19–24. DOI: 10.21437/SSW.2021-4.
- Halpern, Bence, Finnian Kelly, et al. (2020). “Residual Networks for Resisting Noise: Analysis of an Embeddings-based Spoofing Countermeasure”. In: *Proc. The Speaker and Language Recognition Workshop (Odyssey 2020)*, pp. 326–332. DOI: 10.21437/Odyssey.2020-46.
- Halpern, Bence Mark, Rob van Son, et al. (2020). “Detecting and Analysing Spontaneous Oral Cancer Speech in the Wild”. In: *Interspeech 2020*, pp. 4826–4830. DOI: 10.21437/Interspeech.2020-1598.

Preprints and publications currently under review

- Halpern, Bence Mark, Wen-Chin Huang, et al. (2023). “Improving severity preservation of healthy-to-pathological voice conversion with global style tokens”. In: *Accepted to IEEE Automatic Speech Recognition and Understanding 2023*. arXiv: 2310.02570 [cs.SD].
- Tienkamp, Thomas, Bence Halpern, et al. (2023). “Acoustic and kinematic vowel space in individuals surgically treated for oral cancer”. In: *Submitted to 20th International Congress for Phonetics Science*.
- Tienkamp, Thomas, Teja Rebernik, Bence Mark Halpern, et al. (2023). “Quantifying Articulatory Working Space in Individuals Surgically Treated for Oral Cancer with Electromagnetic Articulography”. In: *Accepted at Journal of Speech and Hearing Research*.
- Halpern, Bence Mark, Teja Rebernik, et al. (2022). “Manipulation of oral cancer speech using neural articulatory synthesis”. In: *Preprint available on arXiv*.