

Internship position on “HapticMic: Studying the Persuasive Effects of Haptics during Speech-Based Interactions”

Environment

The work will be carried out at **IRISA-Inria Rennes** as part of the HYBRID team (<https://team.inria.fr/hybrid/>), which is internationally recognized for its scientific activity as well as for technology transfer experience in the field of virtual reality, 3D interaction, haptic feedback, and human-machine interaction.

Inria is the main French research institution focusing on computer science and applied mathematics, employing 3900 researchers and engineers in 10 research centers.

Rennes is a lively city in the north-west part of France, capital of the Brittany region. Located 90 minutes from Paris and less than one hour from the sea, **Rennes was named as the leading French city in Europe for “quality of life”** in 2020 and has the highest satisfaction rate among its inhabitants (source: European Commission).

Topic

Vibrotactile feedback is directly related to sound. When we speak, we make our body vibrate. At a concert, we feel vibratory feedback if we get close to a speaker. Vibrations seem to be an interesting way to emphasize sound feedback. Persuasive speech is broadly used in verbal communication, for instance in meetings, advertisements, informal discussions among friends, etc. Being able to modulate speaker leadership or persuasion in a collaborative environment could be of interest to increase inclusivity (e.g. of shy participants) or to solve conflicts. Previous studies have suggested that leadership is influenced by visual feedback. Very recently, we conducted two experiments where participants embody a first-person avatar attending a virtual meeting in immersive VR. Results showed that vibrotactile-reinforced speech can significantly improve the perceived co-presence but also the persuasiveness and leadership of the haptically-augmented agent.



Figure. In a previous work, we investigated whether reinforcing speech with vibrotactile feedback displayed in users’ hand could improve perceived persuasion, leadership, and co-presence when users listen to agents (left) or when users talk to agents (right) in VR [Saint-Aubert et al., *IEEE VR* (2023)].

The objective of this research work is to **design and evaluate a haptic-enabled microphone, able to reinforce speech in real-time through vibrotactile feedback.**

The work will address the following points, tuned according on the expertise and interests of the student:

- Development of the HapticMic: endow a standard microphone of haptic capabilities, so as to enable to reinforce the speech with vibrotactile feedback at runtime.
- Evaluation in Virtual Reality: design and evaluate the effect of speaking through the HapticMic during an immersive VR speech-interaction with virtual avatars in terms of perceived persuasion, leadership, and co-presence.
- Evaluation in the real world: design and evaluate the effect of speaking through the HapticMic during a real speech-interaction with other humans in terms of perceived persuasion, leadership, and co-presence.

Requirements

- B.Sc. degree in computer science or related fields;
- Experience in C/C++/C# , Unity3D, VR/AR tools, human-robot interaction;
- Excellent scientific curiosity, motivation, and ability to work independently.

References

J. Saint-Aubert, F. Argelaguet, M. J.-M. Macé, C. Pacchierotti, A. Amedi, A. Lécuyer. Persuasive Vibrations: Effects of Speech-Based Vibrations on Persuasion, Leadership, and Co-Presence During Verbal Communication in VR. IEEE VR 2023 - Virtual Reality. [\[PDF\]](#)

Duration

5-6 months

Benefits and Salary

According to French laws (e.g., subsidized meals, partial reimbursement of public transport costs, flexible organization of working hours, insurance).

Advisors and contact

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How to apply

Contact Justine Saint-Aubert at justine.saint-aubert@inria.fr, providing

- Complete Curriculum Vitae (CV)
- Transcript of record

- Short letter of motivation (1 page)
- Name of one or two references, e.g., a Professor you worked with.