

The Use of Virtual Reality in Public Speaking Training

Design of a dedicated tool

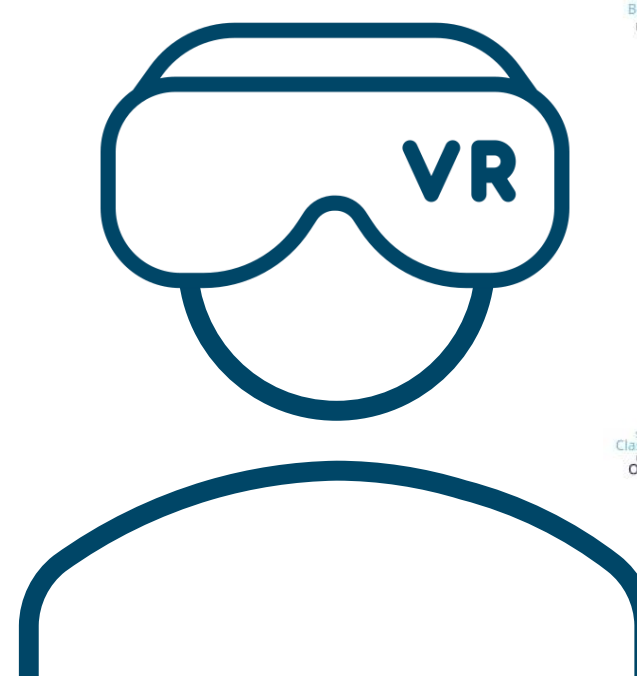
Saufnay S., Etienne E., Schyns M.

Speaking in public is an essential soft skill in both private and professional life, yet it is highly feared

Public speaking skills can be acquired through training



Limitations of traditional training approaches



Team meetings
Company announcement
Speaking at a conference
Collaborate with coworkers
Going for a job interview
Classroom management
Having difficult discussions
Conducting a job interview
Interacting with clients
Pleading in court
Giving a speech
Oral exams
Product presentation
Thesis defense
Crisis communication
Project presentation
Giving a lesson
Sales pitch
Investor pitch
Product launch
Company announcement
Promotion request
School project
Pleading in court
Oral exams



AUDIENCE DESIGN



Perceptive studies guide audience design

Validated library of nonverbal behaviors (Etienne et al., 2023)

Behaviors Posture, head movement, and facial expression combinations that vary in valence and arousal^{1,2}

→ **Valence** How positively or negatively the audience feels toward the speaker or the presentation²

→ **Arousal** The level of alertness of the audience²

Events and contextual behaviors

Events and behaviors based on the simulated public speaking context

Appearance

- **Photo-realistic agents** of various age, ethnicities, and genders
- No uncanny effect observed¹

TRAINING APPROACH

Presentation



Performance feedback

Performance dashboard provided and opportunity to **replay** the presentation in VR



Performance analysis

Audience reaction

Multimodal cues are better predictors of performance^{3, 4}

Linguistic

- ✓ Word count
- ✓ Words used
- ✓ Language diversity metrics
- ✓ ...

Paralinguistic

- ✓ Fundamental frequency (pitch)
- ✓ Voice intensity
- ✓ Speech rate
- ✓ ...

Nonverbal

- ✓ Stage usage
- ✓ Hand movements
- ✓ Gaze
- ✓ Body language
- ✓ ...

CONCLUSION

- Training solution applicable in multiple domains and contexts
- Validated nonverbal behavior library
- Validated photorealistic virtual agents
- Virtual rooms validated in terms of presence⁵
- **Next steps:**
 - ✓ Enrich the performance dashboard
 - ✓ Automatic reaction of the audience
 - ✓ Effectiveness assessment

REFERENCES

- ¹ E. Etienne, A.-L. Leclercq, A. Remacle, L. Dessart, and M. Schyns. Perception of avatars nonverbal behaviors in virtual reality. *Psychology and Marketing*, 40(11): 2464–2481, 2023. doi: 10.1002/mar.21871.
- ² M. Chollet and S. Stefan. Perception of virtual audiences. *IEEE Computer Graphics and Applications*, 37(4): 50–59, 2017. doi: 10.1109/MCG.2017.3271465.
- ³ L. Chen, C. W. Leong, G. Feng, C. M. Lee, and S. Somasundaran. Utilizing multimodal cues to automatically evaluate public speaking performance. In *2015 International Conference on Affective Computing and Intelligent Interaction, ACII '15*, pages 394–400, USA, 2015. doi:10.1109/ACII.2015.7344601.
- ⁴ T. Wörtwein, M. Chollet, B. Schauerte, L.-P. Morency, R. Stiefelhagen, and S. Scherer. Multimodal public speaking performance assessment. In *Proceedings of the 2015 ACM International Conference on Multimodal Interaction, ICMI '15*, page 43–50, New York, NY, USA, 2015. doi: 10.1145/2818346.2820762.
- ⁵ S. Bouchard and G. Robillard. Validation canadienne-française du gatinneau presence questionnaire auprès d'adultes immergés en réalité virtuelle. In *87e Congrès de l'ACFAS*, 2019.