

EYE GOT IT: A SYSTEM FOR AUTOMATIC CALCULATION OF THE EYE-VOICE SPAN

INTRODUCTION

LeCycl is an ANR trilateral project focusing on knowledge transfer.



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Correlation speech + eye tracking [1]

Goal: Build an experimental paradigm for L2 learning using multimodal information

FIRST EXPERIMENT

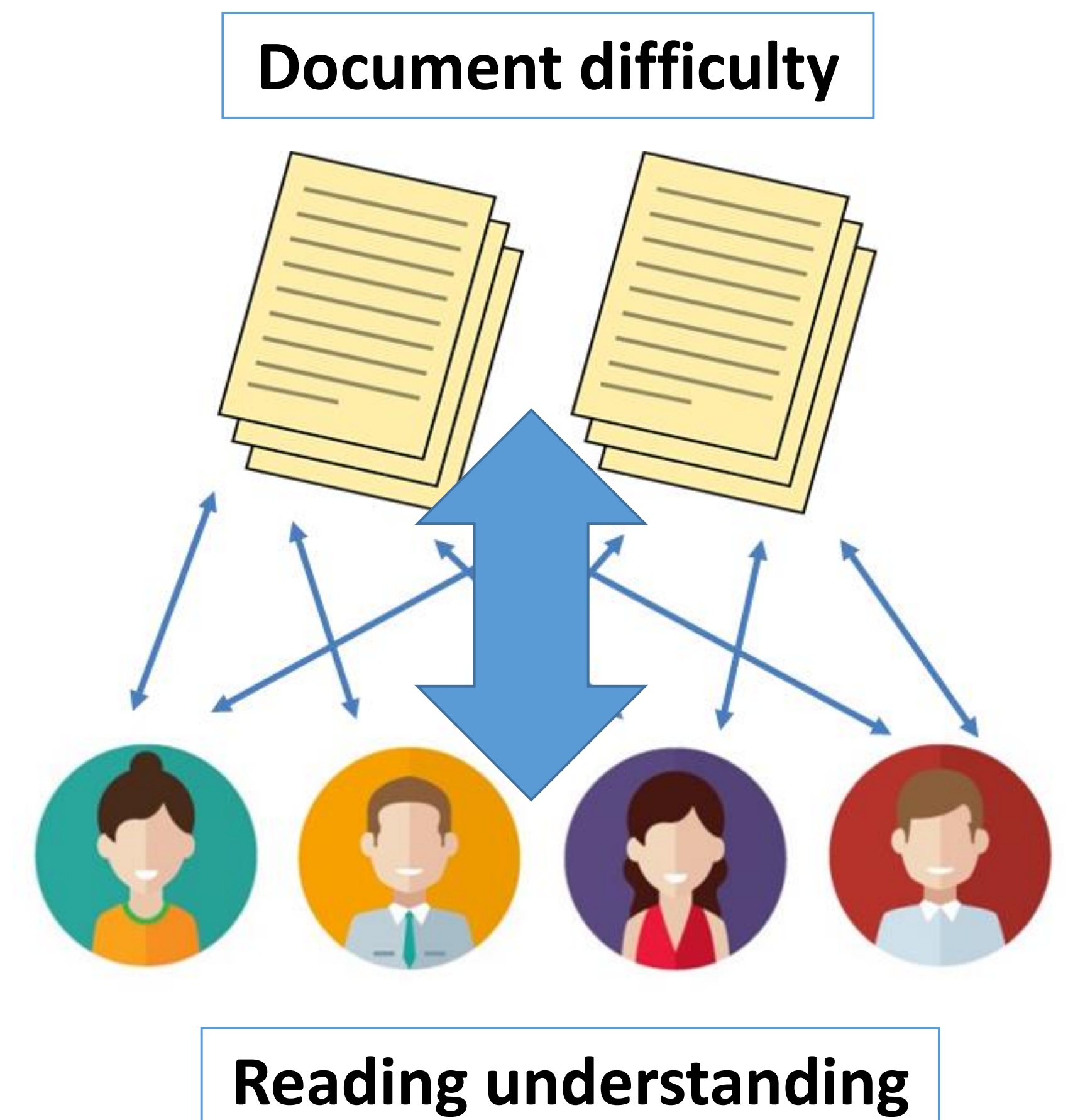
- **Participants:** 5 French native speakers, > 18 y.o, any level of English (A1-C2)
- **Experiment:** read aloud 3 texts in English of different levels (1 text per level)
- **Procedure:** record voice + eye movement using Eye Got It

DOCUMENT AND READER MUTUAL ANALYSIS

Document analysis (text, linguistic features, layout...)

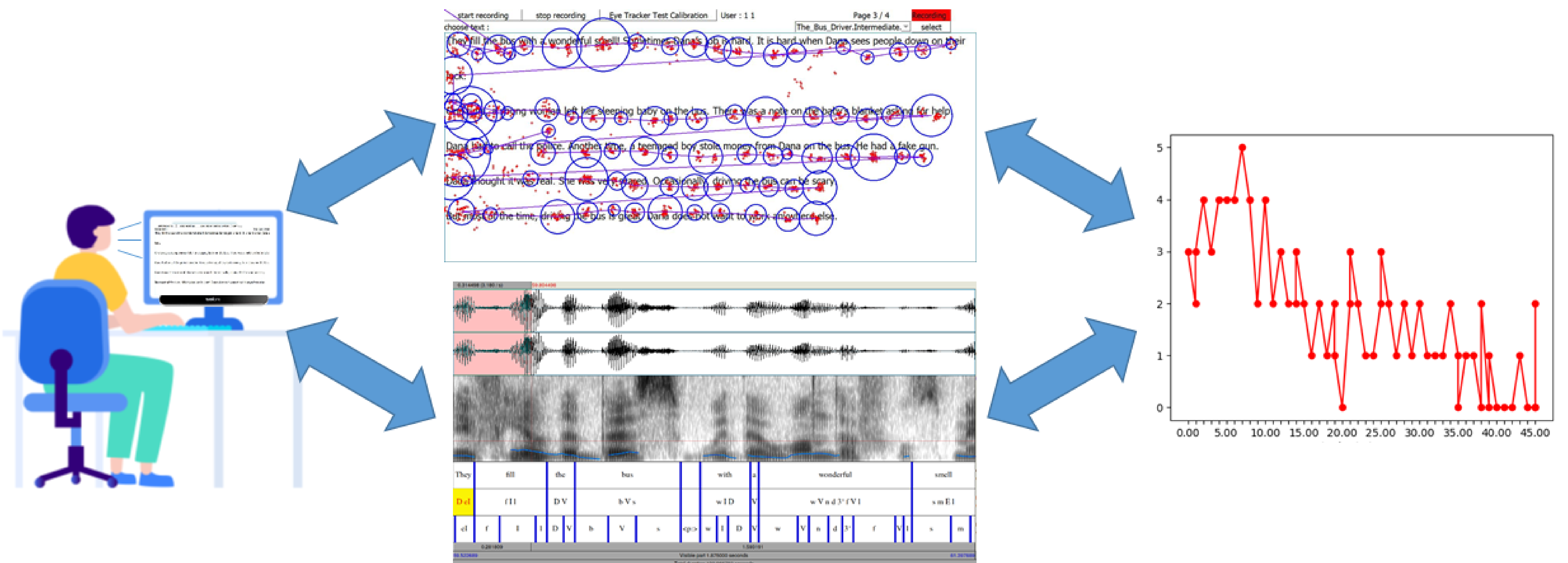
Sensors (eye tracking, microphone, ...)

Reader analysis (eye gaze, voice, posture, ...)



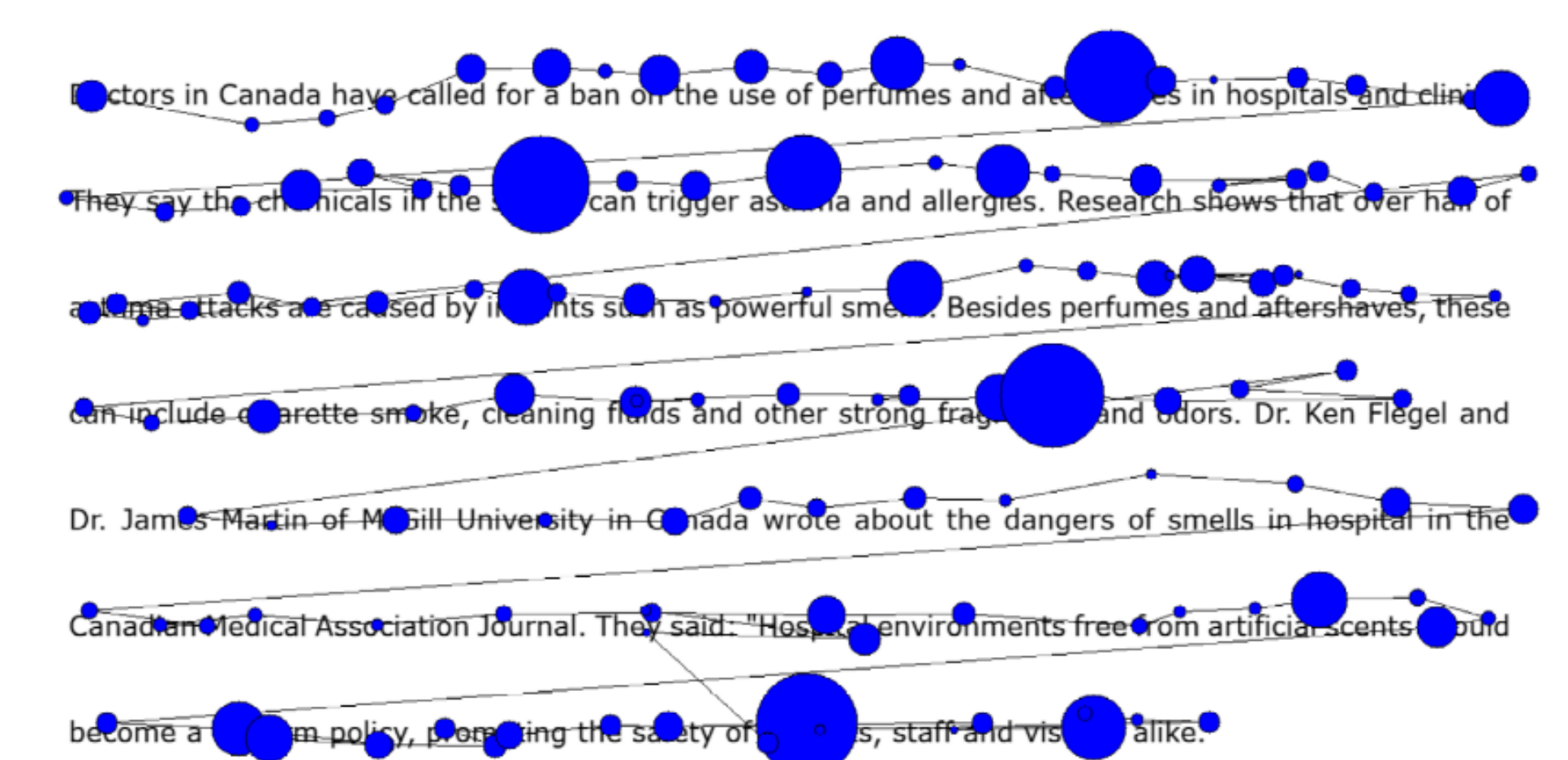
EYE GOT IT PLATFORM

- An open source platform [3]: https://github.com/oaugereau/Eye_Got_It/
- Records eye gaze & voice, forced aligner for voice (MAUS) + transcription alignment, calculates the eye-voice span



EYE-TRACKING FEAT. IN L2

- saccades & fixations
- total time spent per page/per paragraph [5]
- word-skipping
- latences (gap between voice vs eyes)
- image example eye-tracking [4]



EYE-VOICE SPAN CALCULATION

- Detect fixations and saccades [2]
- Align speech using MAUS forced aligner [6]
- Compute the distance between eye gaze and speech

RECORDINGS QUALITY

In order to avoid low quality recordings/processing errors, we set up three thresholds: the % of fixations in words, the % of words with at least one fixation, and the % of eye gazes in a fixation.

REFERENCES

- [1] Olivier Augereau, Hiroki Fujiyoshi, and Koichi Kise. "Towards an automated estimation of English skill via TOEIC score based on reading analysis". In: *ICPR'16*. 2016, pp. 1285–1290.
- [2] Georg Buscher, Andreas Dengel, and Ludger van Elst. "Eye movements as implicit relevance feedback". In: *CHI'08 extended abstracts on Human factors in computing systems*. 2008, pp. 2991–2996.
- [3] Mohamed El Baha et al. "Eye Got It: a System for Automatic Calculation of the Eye-Voice Span". In: *15th IAPR DAS*, 2022.
- [4] Utpal Garain et al. "Identification of Reader Specific Difficult Words by Analyzing Eye Gaze and Document Content". In: *2017 14th IAPR ICDAR*. Vol. 01. 2017, pp. 1346–1351.
- [5] S bastien Lall , Cristina Conati, and Roger Azevedo. "Prediction of Student Achievement Goals and Emotion Valence during Interaction with Pedagogical Agents". In: *AAMAS'18*. Stockholm, Sweden, 2018, pp. 1222–1231.
- [6] Florian Schiel. "A statistical model for predicting pronunciation." In: *ICPhS*. 2015.