

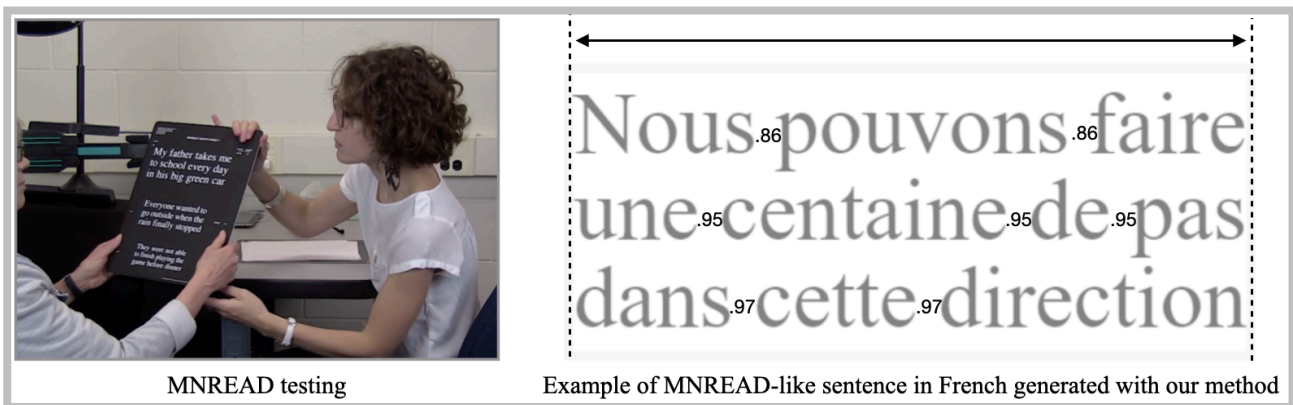
The digital world is offering an amazing range of possibilities for everyone, especially for people with disabilities. Come and join us as a **Master 2 intern** to leverage new technology to offer life-changing solutions for people with visual impairment.



## Validation of automatically generated reading material in a virtual reality environment: A behavioral study

**Aurélie Calabrèse**, Junior research scientist, [BIOVISION Lab](#), Inria

**Pierre Kornprobst**, Senior research scientist, [BIOVISION Lab](#), Inria



**CONTEXT:** Reading speed is a strong predictor of visual ability and vision-related quality of life for patients with vision loss. Therefore, **reading performance** has become one of the most important clinical measures for judging the effectiveness of treatments, surgical procedures or rehabilitation techniques.

**PROBLEM:** Accurate measurement of reading performance requires highly standardized reading test, such as the **MNREAD acuity chart** [1]. This test, available in 19 languages, allows to measure reading performance in people with normal and low vision. In brief, performance is measured from the time needed to read a **series of short sentences** that were designed to be equivalent in terms of linguistics, length and layout. To ensure accurate measurement, each sentence must be presented only once to avoid introduction of a memorization bias. However, because of their **highly constrained** nature, MNREAD sentences are hard to produce, leading to a very limited number of test versions (only two in French). Given that repeated measures are needed in many applications of MNREAD, there is a strong interest from the scientific and medical communities for a much **larger pool of sentences**.

**STATE-OF-THE-ART:** Very recently, we developed a method to generate automatically a very large number of **coherent sentences**, in French, while taking into account the strict linguistics, length and layout constraints, imposed by the MNREAD rules.

**INTERNSHIP OBJECTIVES:** The goal of the proposed project is to validate the reading material created with our generator on normally sighted individuals. Both original MNREAD sentences and our set of generated MNREAD-like sentences will be displayed in an existing **virtual reality** environment using the HTC Vive Pro Eye headset. Reading performance (speed and **eye movements**) will be recorded and compared for both sets of sentences.

**SKILLS YOU WILL LEARN:** Experimenting in a virtual reality environment, recording and analysing eye movement data, basic linguistic notions, basic statistical analysis notions.

**BIBLIOGRAPHY:**

[1] Mansfield J.S., Ahn S.J., Legge G.E., Luebker A. (1993) A new reading-acuity chart for normal and low vision. *Ophthalmic and Visual Optics/Noninvasive Assessment of the Visual System Technical Digest*, (Optical Society of America, Washington, DC., 1993.) 3: 232--235.

**SUPERVISORS:** The candidate will be co-supervised by P. Kornprobst, a mathematician with strong expertise in computer vision and human vision understanding and A. Calabrèse, a psychophysicist specialized in visual neuroscience with a strong clinical expertise.

**CONDITIONS:**

- Duration: 6 months
- Where: Inria Sophia Antipolis - Méditerranée, France (<https://www.inria.fr/en/centre/sophia>).
- Salary:  $\approx$  550 euros per month.

**CURRICULUM OF THE CANDIDATE:** The candidate should have a relevant Master, for example in cognitive psychology, psycholinguistics, natural language processing, computer science, digital humanities.

**FOLLOW-UP:** Funding opportunities to continue for a Ph.D.

**TO APPLY:** Please visit <https://team.inria.fr/biovision/internship-applications>.