

Title: An experimental protocol to assess the impact of abbreviations on the legibility of cockpit texts

Context and state-of-the-art:

Modern commercial cockpits rely heavily on visual displays, such as flight control panels, electronic centralized aircraft monitor (ECAM) procedures, and system status pages, to deliver critical operational information to flight crews. Due to severe physical space constraints on cockpit screens, technical prose relies heavily on visual abbreviations. However, human factors remain a primary or contributing factor in approximately 70% of aviation incidents, with communication breakdown and language comprehension forming a major subset of these issues. Poorly legible or ambiguous textual abbreviations can induce unnecessary cognitive workload, slow visual processing speeds, and increase the risk of misinterpretation during time-critical flight phases, directly threatening operational safety.

From an academic perspective, textual usability is conceptualized through distinct levels: legibility (the visual ease of identifying individual letters or characters) and readability (the visual comfort and efficiency of parsing continuous words and sentences). Psycholinguistic and human factors research shows that while simple truncations are often preferred during text encoding, non-standard or highly irregular abbreviations incur a significant processing cost during decoding. This processing cost translates into longer fixation durations, higher fixation counts, and potential visual decoding errors. However, academic findings also indicate that legibility and decoding efficiency improve significantly when abbreviations preserve structural anchors (such as initial/final boundary characters) or are presented within clear semantic contexts.

Bridging these industrial and academic domains, this internship aims to establish a framework for evaluating and optimizing cockpit text displays. By drawing on state-of-the-art legibility assessment methods—such as eye-tracking metrics (fixation durations, saccade amplitudes, off-road/display glance durations), visual search paradigms, and reading latency tasks—the project will evaluate how abbreviations impact a pilot's cognitive load and reading speed. Ultimately, the goal is to design an experimental protocol to quantify the impact of visual abbreviations on text legibility, providing guidelines to balance screen space constraints with flight deck safety.

Bibliography:

Kamandhari, H. H. (2020). The Definitions and the Measurement of Legibility and Readability in Instructional Text Design: An Integrated Literature Review

Nielsen, J. (2015). Legibility, Readability, and Comprehension: Making Users Read Your Words

Rana, F. S. (2017). How does Reading Internet and Texting Abbreviations Affect Processing?

Parry, D., Odedra, A., Fagbohun, M., Oeppen, R. S., Davidson, M., & Brennan, P. A. (2023). Abbreviation Use Decreases Affective Clinical Communication and can Compromise Patient Safety

Burmistrov, I., Zlokazova, T., Ishmuratova, I., & Semenova, M. (2016). Legibility of Light and Ultra-Light Fonts: Eyetracking Study

Perea, M., Moret-Tatay, C., & Gómez, P. (2011). The Effects of Interletter Spacing in Visual-word Recognition

Missions and tasks:

- Literature review
- Experimental protocol design
- Feasibility study (experimental dry-run)

This internship will allow you to develop the following skills and knowledge:

- Mastery of legibility / readability concepts and controlled language applied to critical systems ergonomics.
- Programming and use of Artificial Intelligence technologies for the analysis of text corpora and linguistic resources.
- Ability to design experimental protocols.
- Ability to work in an international multidisciplinary team with diverse profiles (ergonomists, systems engineers, test pilots, instructor pilots, operations specialists, etc.).

Pre-requisites:

You are currently pursuing a degree in Linguistics or Cognitive Science in one of the following fields:

- Corpus Linguistics
- Terminology / Controlled Languages
- Natural Language Processing
- Cognitive Linguistics
- Psycholinguistics
- Cognitive Ergonomics.

Your English proficiency level is CEFR B2 at minimum. French is not required.

Tutor and work environment:

The internship will take place in the “Human Factors & Ergonomics in Cockpit Design” department of Airbus Commercial Aircraft. The internship will be supervised by Estelle Delpech, Ph. D., Human Factors specialist. You will join an international and multidisciplinary team of 30 Human Factors specialists and experts with various academic backgrounds (linguistics, cognitive psychology, ergonomics, neuroscience, physiology, psychoacoustics).

Conditions:

- Paid internship
- 6 months duration
- Expected start date: January / February 2027 (to be discussed)
- No nationality restrictions
- Toulouse Saint-Martin, France

Application:

Applicants must submit their application officially through the [Airbus Careers Platform](#). We also encourage candidates to send a copy of their CV directly to us at estelle.e.delpech@airbus.com and siu-kei.pepe-lo@airbus.com.

The application deadline is October 15.