

Leveraging Large Language Models for Joint Linguistic and Technical Accessibility Improvement: A Case Study on University Webpages

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Abstract

The aim of the study presented in this paper is to investigate whether Large Language Models can be leveraged to translate French content from existing websites into their B1-level simplified versions and to integrate them into an accessible HTML structure. We design a CMS agnostic approach to webpage accessibility improvement based on prompt engineering and apply it to Geneva University webpages. We conduct several automatic and manual evaluations to measure the accessibility improvement reached by several LLMs with various prompts in a zero-shot setting. Results show that LLMs are not all suitable for the task, while a large disparity is observed among results reached by different prompts. Manual evaluation carried out by a dyslexic crowd shows that some LLMs could produce more accessible websites and improve access to information.

1 Introduction

According to the Federal Statistical Office, the number of students accessing higher education in Switzerland has doubled since 2000, while the number of students with disabilities has decreased and remains the lowest compared to other groups, such as people of foreign origin¹. This low penetration rate could be explained, among other reasons, by the difficulty of accessing information (Yerlikaya and Onay Durdu, 2017).

Since 2004, information accessibility has been a legal requirement in Switzerland for all areas of life, with the adoption of the Federal Act on the Elimination of Discrimination against People with Disabilities (LHand), as well as Switzerland's

ratification of the UN Convention on the Rights of Persons with Disabilities (UNCRPD) in 2014. The Uni-Access project², financed by swissuniversities³, aims to understand the barriers faced by users of Geneva University websites. In line with the recommendations of the new version of the Swiss accessibility standard for websites eCH-0059⁴, it proposes concrete solutions to integrate simplified language and sign language on university webpages, including corpora and tools.

The Uni-Access pipeline for creating accessible webpages, given original webpages that are not optimized for accessibility, consists in three main steps: 1) intra-linguistic translation of the original content by an Easy-to-Read (E2R) expert into a B1-level simplified version and validation of the result with the content creator and the different target groups, 2) translation of the simplified version into sign language videos by deaf translators at the level of sentence or paragraph, and 3) creation of the webpage with the institution's CMS⁵ following WCAG2.2⁶ web accessibility guidelines⁷.

The aim of the study presented in this paper is to investigate whether LLMs (Large Language Model) can be leveraged to translate French content from existing websites into a B1-level simplified version and to integrate it into a highly accessible HTML structure. We design a CMS agnostic approach to webpage accessibility improvement based on prompt engineering and apply it to Geneva University webpages. To the best of our knowledge, this is a first attempt at leveraging LLMs for joint linguistic and technical accessibil-

²<https://www.unige.ch/uni-access>

³<https://www.swissuniversities.ch/en/>

⁴eCH-0059 – Accessibility Standard 3.0. Retrieved from <https://www.ech.ch/fr/ech/ech-0059/3.0>

⁵for Geneva University: Concrete CMS version 8.5.17

⁶<https://www.w3.org/TR/WCAG22/>

⁷Examples of web pages can be found on the Uni-Access project website: <https://www.unige.ch/uni-access/demos>

ity improvement. The main contributions of this work are: 1) the comparison of various prompts and open-weights pre-trained LLMs to jointly transform existing webpages into their simplified versions and 2) a two-step evaluation process relying on automatic metrics and manual evaluation through crowdsourcing.

The remainder of this paper is organized as follows. In Section 2, we present previous work on LLMs applied to web accessibility. Section 3 describes our methodology, including the models used, our prompting method and evaluation protocol. Finally, the results are detailed in Section 4 followed by a conclusion in Section 5.

2 LLM for Web Accessibility

Creating websites following the Uni-Access pipeline is time consuming and labor intensive, which limits its positive impact. In Switzerland, for example, the presence of simplified and sign language has been reported to still be anecdotal in the web ecosystem (David et al., 2023; Rodríguez Vázquez et al., 2022). Recently, LLMs have been studied as a means to create more accessible content (Freyer et al., 2024), and enhance linguistic and technical web accessibility.

Linguistic accessibility Different studies explore the potential of ChatGPT for content adaptation to simplified language (Easy to read – E2R – or Plain language), for example (Madina et al., 2024; Deilen et al., 2024). Common findings are that generated texts are easier than originals, but do not meet specific criteria (Madina et al., 2024). They also contain a lot of content related mistakes (Deilen et al., 2024), and fail to perform logical reordering at the text level (Madina et al., 2024) and to give explanations (Saggion, 2024).

Technical accessibility Previous studies explored LLMs’ ability to assist in creating specific accessible content for web applications and examined ChatGPT’s ability to fix web accessibility issues, but no previous study seems to have investigated the ability of LLM to adapt a source website into the corresponding accessible B1 version (López-Gil and Pereira, 2024; Aljedaani et al., 2024).

3 Methodology

We describe the methodology employed, including the automatic accessibility improvement approach

using LLMs, the dataset used in our experiments, the pre-trained models and prompts selection, as well as the user evaluation.

3.1 Automatic Accessibility Improvement

Given an existing website without improved accessibility, our goal is to prompt a LLM in a zero-shot fashion to obtain a highly accessible website following pre-defined rules (presented in Appendix A), with a valid HTML structure and B1-level French content. We hand-crafted various prompts, written in English or French, and selected the best performing one. The exact prompt and its variants used in our experiments are presented in Appendix C. The input of each LLM tested in our study is composed of a hand-crafted prompt followed by the HTML content to be processed for accessibility improvement. Due to the recent publication of the WCAG2.2 guidelines, and based on the publication dates of the LLMs tested, we specify an earlier WCAG version in the prompt, assuming that LLMs training data might contain an earlier version of the guidelines.

3.2 Dataset

Our dataset consists in two pages from the Geneva University website, manually simplified following the Uni-Access pipeline. Original and simplified pages are presented in Appendix D. Both pages describe complex administrative procedures – one about the library book lending service (noted *Biblio*) and the other about the conditions for accessing a specific educational program (noted *Horizon*). The original pages achieve various levels of linguistic and technical accessibility. In particular, both pages contain a lot of jargon. The second page also features a HTML table that does not comply with accessibility guidelines.

3.3 Model Selection

Improving Web accessibility involves transforming the linguistic content and HTML structure of existing websites. Thus, an ideal LLM for the Uni-Access pipeline would be trained on various levels of French language (eg. A1, B2, etc.) and on web-related languages (eg. HTML, Javascript, etc.). However, due to the prohibitive costs of training LLMs on large amounts of data, we selected pre-trained models amongst popular open-weights LLMs, trained in a multilingual fashion with both natural and programming languages.

Preliminary accessibility experiments conducted in-house on various prompts and LLMs allowed us to select the best performing models for the task. From an initial pool of 9 pre-trained models (see Appendix B), 4 were selected for the automatic and manual evaluation, before selecting the best performing model, which was used for the crowd-based evaluation. The selection of 4 models from the initial pool relied on a two-step evaluation process:

i) automatic evaluation using publicly available metrics⁸, namely:

- WAVE, identifying WCAG related errors on webpages⁹
- AMesure, focusing on text difficulty for French. It provides a global readability score for the text, that is computed by a readability formula. The output score ranges from 1 (for very easy texts) to 5 (for very complex texts) and is yielded by a support vector machine classifier combining 10 linguistic features of the text (François et al., 2014; François et al., 2020).¹⁰
- CEFRLex, performing token-level classification according to French levels (A1 to C2) based on existing dictionaries (François et al., 2014; Pintard and François, 2020).¹¹
- W3C Validator, assessing the validity of a webpage HTML code¹²

ii) manual evaluation to verify for textual content omission caused by the LLM during the translation into French B1 language. For the manual evaluation, we asked a member of Geneva University administrative staff with expert knowledge of university policies and procedures to define ten questions for each webpage to be processed. We then checked if the LLM outputs contained the answers to all questions.

3.4 User evaluation

To assess whether the transformation of the pages improves their understandability, and thereby their usefulness for end-users seeking information, we carried out a reading comprehension test with users (Scarton and Specia, 2016). We included in this evaluation all three versions of the two webpages: the original, the manually simplified and the LLM output that achieved the highest score during model

selection. We measure the user’s ability to answer questions about the page content, the time required to find the answers in the page, and we collect the user’s subjective opinion of the page’s readability. Participants were recruited on the Prolific platform¹³. We used the platform’s screeners to select participants with fluent French and to create two groups: dyslexic and non-dyslexic. For this study, we chose a between-subjects design in order to avoid learning effects. Each of the 6 pages was submitted to 10 participants. On each page, participants had to 1) sequentially answer three questions related to the page content (one yes/no question, two short answer questions), and 2) rate the page’s readability on a six-point scale. Timestamps for page loading and response submission were collected through the page. All participants were paid a fixed amount for the task according to estimated completion time and Prolific’s payment principles.

4 Results

This section presents the results obtained with automatic and manual evaluation during the model selection process, as well as the results obtained with the crowd-based manual evaluation.

4.1 Model Selection

As mentioned, the model selection follows a two-step process based on LLMs outputs: automatic evaluation for linguistic and technical accessibility, and manual verification of information omission.

Automatic evaluation results are presented in Table 1 for the *Biblio* and *Horizon* webpages. We evaluated the original webpages, their manually improved versions, as well as their automatically processed versions produced by LLMs. The AMesure metric indicates that LLMs do not reach the readability level of the manually produced *Biblio* page, although they do improve the original textual content. The token-level classification done by the CEFRLex metric shows a strong disparity among LLMs and prompts, especially for the A1 level. Especially, for the *Biblio* webpage, the model #7 with the first prompt reaches a higher ratio of A1 classified tokens compared to the manually processed page. However, LLMs tend to produce outputs with fewer tokens compared to *original* and *manual*, which motivates our manual evaluation to verify for information omission, because shorter

⁸All metrics were accessed online in March 2025.

⁹<https://wave.webaim.org/>

¹⁰<https://cental.uclouvain.be/amesure/>

¹¹<https://cental.uclouvain.be/cefrlex/analyse/>

¹²<https://validator.w3.org>

¹³<https://www.prolific.com/>

prompt	model	tokens	AMesure	CEFRLeX (% tokens)						W3C	WAVE			
				A1	A2	B1	B2	C1	C2		unk.	ign.	err.	contr.
<i>Webpage: Biblio</i>														
-	original	792	3	57.1	3.2	8.6	6.4	0.5	0.6	4.5	19.1	13	2	2
-	manual	748	1	59.6	4.9	5.5	2.9	0.1	0.3	4.5	22.1	2	2	2
1	2	758	2	59.5	3.3	8.0	5.9	0.5	0.7	3.2	18.9	26	2	2
	5	862	2	52.7	3.4	7.8	5.9	0.5	0.6	5.1	24.1	8	2	0
	7	592	2	60.1	2.5	7.8	6.6	0.7	0.2	2.7	19.4	6	2	0
	9	442	2	47.7	3.2	6.6	5.2	0.0	1.1	5.9	30.3	7	2	0
2	2	179	2	55.3	3.9	8.4	5.0	1.1	0.0	3.9	22.3	15	2	0
	5	853	2	52.3	3.4	7.9	6.0	0.5	0.6	5.2	24.3	6	2	0
	7	728	3	59.6	3.0	8.4	6.5	0.5	0.7	3.2	18.1	6	2	0
	9	533	3	43.0	3.0	6.2	6.6	0.0	0.8	5.1	35.5	9	2	0
3	2	660	2	59.2	3.5	7.4	5.5	0.3	0.6	3.3	20.2	15	2	2
	5	851	2	52.3	3.4	7.9	6.0	0.5	0.6	5.2	24.2	6	2	0
	7	676	2	59.8	3.1	8.4	6.7	0.6	0.7	2.7	18.0	7	2	0
	9	534	2	47.9	3.2	6.0	6.9	0.2	0.7	5.1	30.0	10	2	0
<i>Webpage: Horizon</i>														
-	original	698	3	52.0	4.6	9.6	8.6	1.9	0.1	3.7	19.5	17	3	1
-	manual	938	2	60.6	5.0	5.5	5.1	0.3	0.1	2.5	20.9	14	3	0
1	2	242	2	54.1	4.1	10.3	5.8	1.2	0.0	5.8	18.6	12	2	0
	5	833	2	54.4	4.3	8.8	7.1	1.2	0.0	3.0	21.2	7	2	0
	7	590	3	58.0	3.9	7.6	6.3	1.0	0.7	2.4	20.2	6	2	0
	9	391	3	48.3	3.3	6.9	9.5	1.0	0.0	2.3	28.6	6	2	0
2	2	249	3	49.8	4.4	8.4	9.2	1.2	0.0	7.6	19.3	12	2	0
	5	672	2	54.6	4.0	8.8	7.3	1.8	0.0	3.3	20.2	9	3	0
	7	433	2	59.1	4.6	7.2	6.2	0.9	0.0	2.8	19.2	7	2	0
	9	451	3	45.2	3.3	10.4	7.5	1.8	0.2	2.0	29.5	7	2	0
3	2	415	2	46.5	3.9	8.4	9.2	2.2	0.0	9.9	20.0	6	2	0
	5	731	2	54.6	4.2	8.3	7.1	1.5	0.0	3.0	21.2	11	3	0
	7	479	3	58.7	4.6	7.1	6.3	0.6	0.2	1.9	20.7	6	2	0
	9	524	3	51.7	4.2	8.6	8.2	1.0	0.0	3.2	23.1	7	2	0

Table 1: Comparison between four pre-trained LLMs and three prompt variants for the automatic accessibility improvement of the webpages *Biblio* (top) and *Horizon* (bottom) according to automatic metrics measuring linguistic and technical accessibility. The *unk.* and *ign.* columns indicate the unknown and ignored tokens of the CEFRLeX metric, respectively. The *err.* and *contr.* columns denote the global and contrast errors of the WAVE metric, respectively. For model and prompt IDs, please refer to Appendix B and to Appendix C. Bold values are prompts and models selected for crowd-based evaluation.

webpages could lack mandatory information included in the *original* and *manual* versions.

Manual verification for information omission is based on a set of 10 questions drafted by a domain expert. For each question, we check if the LLM outputs contain the answer and annotate them accordingly in a binary fashion. The average scores per prompt variant and model, for the two webpages of our study, are presented in Table 2. These results highlight the importance of careful prompt crafting, for instance with model #5 reaching 0.9pts (max. 1.0) with the first prompt and 0.1 with the second prompt on the *Biblio* webpage. The same model does not perform well on the *Horizon* webpage, while model #2 shows less variability on this page among the prompt variants.

Based on the automatic and manual evaluation results, the final prompts are #1 and #3 for the webpages *Horizon* and *Biblio* respectively. The best model for both pages is *Qwen2.5-Coder-32B-Instruct* (Hui et al., 2024).¹⁴

4.2 User Evaluation

The crowd-based user evaluation was carried out on 6 webpages (2 original webpages, their manually improved version and the best LLM outputs). We collected 10 responses for each of the 6 pages. Table 3 shows the number of correct responses by page and question. Some participants responded in languages other than French, or with full sen-

¹⁴<https://huggingface.co/Qwen/Qwen2.5-Coder-32B-Instruct>

prompt	model	<i>Biblio</i>	<i>Horizon</i>
1	2	0.8	0.8
	5	0.9	0.1
	7	0.8	0.8
	9	0.6	0.7
2	2	0.8	0.8
	5	0.1	0.2
	7	0.9	0.5
	9	0.7	0.6
3	2	0.3	0.8
	5	0.9	0.2
	7	0.9	0.7
	9	0.9	0.8

Table 2: Manual verification of information omission for three prompts and four pre-trained models on two webpages, *Biblio* and *Horizon*, for the automatic accessibility improvement task. Scores are averaged binary labels indicating if the answer of a specific question is present in the LLM output. For model and prompt IDs, refer to Appendix B and to Appendix C, respectively. Bold values are prompts and models selected for crowd-based evaluation.

tences instead of the expected short answer. Some responses also led us to believe that participants used LLMs to obtain answers to the questions. Nevertheless, we considered as correct all responses containing the required information.

Multiple causes can lead to an incorrect response in a crowdsourcing context: participants not understanding the page and/or question, careless participants, difficult questions, etc. In order to exclude participants who had not followed the instructions and provided random or irrelevant responses from further analysis, we removed from the dataset the responses where none of the three questions had been answered correctly.

We first calculated the **average readability scores** for this dataset, based on the readability ratings given by participants on a 6-point scale after completing the questions. Table 4 gives the average scores by page and group. Overall the manually simplified versions were rated higher than the original pages. In all cases, with the exception of the non-dyslexic group when evaluating the *Biblio* webpage, the LLM versions are halfway between the original and the manually simplified versions, suggesting the changes made by the models improve perceived readability.

Using this dataset, we also calculated the **time in**

	question 1		question 2		question 3	
	d	nd	d	nd	d	nd
<i>Webpage: Biblio</i>						
original	4	5	4	10	3	4
manual	2	3	7	9	2	3
LLM	4	4	8	8	3	4
<i>Webpage: Horizon</i>						
original	8	9	6	2	7	9
manual	9	9	2	5	10	9
LLM	9	10	2	4	10	7

Table 3: User evaluation of original pages, their manually improved accessibility version and the LLM output, in terms of correct responses by webpage and participant group (*d* and *nd* denote the dyslexic and the non-dyslexic group of evaluators, respectively).

	N	dyslexic	N	non-dyslexic
<i>Webpage: Biblio</i>				
original	5	5.20 (0.84)	10	4.70 (1.06)
manual	8	5.88 (0.35)	10	5.10 (1.29)
LLM	8	5.50 (0.76)	8	5.88 (0.35)
<i>Webpage: Horizon</i>				
original	9	4.89 (1.36)	10	5.50 (0.97)
manual	10	5.70 (0.48)	10	5.60 (0.70)
LLM	10	5.50 (0.97)	10	5.30 (1.06)

Table 4: Mean readability scores and standard deviations (in brackets) by webpage and participant group when manually evaluating original pages, their manually accessibility improved version and the LLM output.

seconds for the task. It was measured over all three questions, from page load until the submission of the answer to the third question. Due to the uncontrolled conditions in which participants completed the tasks, the measured times could have been affected by activities unrelated to the task. Outliers were therefore identified and 7 were removed from the dataset using the Interquartile Range (IQR) method with a threshold of $\pm 1.5 \times \text{IQR}$.

Table 5 shows the median response times for the remaining data. We observe that for the original and manually simplified pages, participants from the dyslexic group spent more time on the task than the non-dyslexic participants. For both LLM versions, the median times are very close for both groups, suggesting that the simplified version might improve access to information for the dyslexic group. Figure 1 shows the median times

	N	dyslexic	N	non-dyslexic
<i>Webpage: Biblio</i>				
original	4	435	9	129
manual	7	316	10	191
LLM	8	237	8	236
<i>Webpage: Horizon</i>				
original	8	193	10	166
manual	9	209	8	158
LLM	10	173	10	171

Table 5: Median response time in seconds by webpage and participant group (outliers removed), when manually evaluating original pages, their manually accessibility improved version and the LLM output.

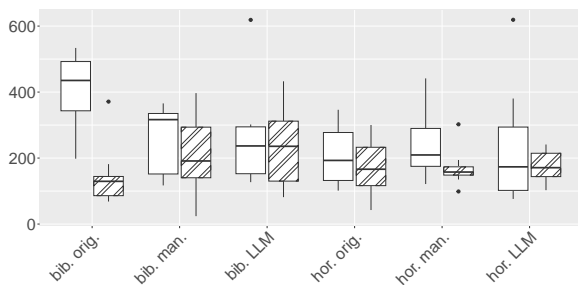


Figure 1: Response time in seconds by webpage (*bib* and *hor* denote the *Biblio* and *Horizon* webpages, respectively) and participant group (dyslexic in white, non-dyslexic striped) for each page (outliers removed)

by page and group.

5 Conclusion and limitations

The main aim of this paper was to investigate whether LLMs could be used to transform academic websites into more accessible versions. We confirmed that LLMs could produce more accessible versions than their originals and improve access to information for dyslexic users. However, 1) not all LLMs are equally suitable for the task, notably regarding omissions and 2) the combination prompt/model leads to unstable performances for both linguistic and technical accessibility, as shown by the automatic metrics and manual verification.

Crowdsourcing had many advantages and enabled us to carry out a user study with different groups such as people with dyslexia. However, during the analysis of these results, incorrect answers were difficult to interpret due to the uncontrolled crowd-based evaluation conditions. Furthermore, it is possible that evaluators used other means of finding answers to the questions, such as publicly avail-

able LLMs, rather than consulting the presented page.

The number of participants could be increased further for future studies, but more comparisons are necessary to validate the experimental approach used, in particular the inclusion of multiple questions per page and the between-subjects design.

Despite all the ethical concerns, notably regarding the content-related issues, our conclusion is that a LLM, associated with a careful preselection and evaluation process, could contribute to level inequalities.

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References

- Wajdi Aljedaani, Abdulrahman Habib, Ahmed Aljohani, Marcelo Eler, and Yunhe Feng. 2024. [Does chatgpt generate accessible code? investigating accessibility challenges in llm-generated source code](#). In *Proceedings of the 21st International Web for All Conference, W4A '24*, page 165–176, New York, NY, USA. Association for Computing Machinery.
- Bastien David, Lucía Morado Vázquez, and Elisa Casalegno. 2023. [The inclusion of sign language on the swiss web ecosystem](#). *Journal of accessibility and design for all: JACCES*, 13(1):1–42.
- Silvana Deilen, Ekaterina Lapshinova-Koltunski, Sergio Hernández Garrido, Christiane Maaß, Julian Hörner, Vanessa Theel, and Sophie Ziemer. 2024. [Towards AI-supported health communication in plain language: Evaluating intralingual machine translation of medical texts](#). In *Proceedings of the First Workshop on Patient-Oriented Language Processing (CL4Health) @ LREC-COLING 2024*, pages 44–53, Torino, Italia. ELRA and ICCL.
- Thomas François, Núria Gala, Patrick Watrin, and Cédric Fairon. 2014. [Flelex: a graded lexical resource for french foreign learners](#). In *International conference on Language Resources and Evaluation (LREC 2014)*.
- Thomas François, Adeline Müller, Eva Rolin, and Magali Norré. 2020. [AMesure: A web platform to assist the clear writing of administrative texts](#). In *Proceedings of the 1st Conference of the Asia-Pacific Chapter of the Association for Computational Linguistics and the 10th International Joint Conference on Natural Language Processing: System Demonstrations*, pages 1–7, Suzhou, China. Association for Computational Linguistics.

Thomas François, Laetitia Brouwers, Hubert Naets, and Cédric Fairon. 2014. [Amesure: a readability formula for administrative texts \(amesure: une plateforme de lisibilité pour les textes administratifs\) \[in french\]](#). In *JEP/TALN/RECITAL*.

Nils Freyer, Hendrik Kempt, and Lars Klöser. 2024. Easy-read and large language models: on the ethical dimensions of llm-based text simplification. *Ethics and Information Technology*, 26(3):50.

Binyuan Hui, Jian Yang, Zeyu Cui, Jiayi Yang, Dayiheng Liu, Lei Zhang, Tianyu Liu, Jiajun Zhang, Bowen Yu, Kai Dang, et al. 2024. Qwen2. 5-coder technical report. *arXiv preprint arXiv:2409.12186*.

Juan-Miguel López-Gil and Juanan Pereira. 2024. [Turning manual web accessibility success criteria into automatic: an llm-based approach](#). *Universal Access in the Information Society*.

Margot Madina, Itziar Gonzalez-Dios, and Melanie Siegel. 2024. [A preliminary study of ChatGPT for Spanish E2R text adaptation](#). In *Proceedings of the 2024 Joint International Conference on Computational Linguistics, Language Resources and Evaluation (LREC-COLING 2024)*, pages 1422–1434, Torino, Italia. ELRA and ICCL.

Alice Pintard and Thomas François. 2020. Combining expert knowledge with frequency information to infer cefr levels for words. In *Proceedings of the 1st Workshop on Tools and Resources to Empower People with READING Difficulties (READI)*, pages 85–92.

Silvia Rodríguez Vázquez, Jesús Torres del Rey, Lucía Morado Vázquez, et al. 2022. Easy language content on the web: a multilingual perspective. *Investigaciones recientes en traducción y accesibilidad digital*.

Horacio Saggion. 2024. [Artificial intelligence and natural language processing for easy-to-read texts](#). *Revista de Llengua i Dret*, pages 84–103.

Carolina Scarton and Lucia Specia. 2016. [A reading comprehension corpus for machine translation evaluation](#). In *Proceedings of the Tenth International Conference on Language Resources and Evaluation (LREC'16)*, pages 3652–3658, Portorož, Slovenia. European Language Resources Association (ELRA).

Zehra Yerlikaya and Pinar Onay Durdu. 2017. Usability of university websites: A systematic review. In *Universal Access in Human–Computer Interaction. Design and Development Approaches and Methods: 11th International Conference, UAHCI*, pages 277–287. Springer.

A Rules for Manual Accessibility Improvement

A list of rules for manual improvement of existing Geneva University webpages were derived from

the accessibility improved pages produced by domain and accessibility experts. These rules are grouped in two categories, linguistic and technical accessibility.

Linguistic accessibility

- Text CEFR B1 level
- Make short sentences
- One idea per sentence
- Use frequent words
- Avoid passives
- Address the person directly
- Follow a logical order of information
- Reinforce coherence
- Don't use undefined abbreviations or terms/jargon
- Replace conditions with questions, for example:
 - If you live abroad, you have to pay fees.
 - Do you live abroad? You pay fees.

Technical accessibility

- Make bulleted lists to describe steps
- 1.5 line spacing
- Go to line after periods
- Non-breaking space before punctuation marks with a space
- Bold for important information, such as dates
- No images and description of images in text

B Models

We compare several models in a zero-shot setting using various prompts. The list of all pre-trained LLMs involved in our study is presented in Table 6 (All models have open weights and are available on the Hugging Face Hub¹⁵). From this initial list of models, we select a subset of four best performing models according to a brief manual check of the LLMs outputs. We removed models with non-HTML outputs, as well as outputs in other languages than French, and unmodified outputs compared to input webpages. The four models selected for automatic and manual evaluation are marked with * in Table 6.

C Prompts

Several hand-crafted prompts were tested in our experiments and the best performing variants are presented in Figure 2.

D Uni-Access Simplified Pages

¹⁵<https://huggingface.co/>

id	Model name	#params.
1	nvidia/Llama-3_1-Nemotron-51B-Instruct	51B
2	meta-llama/Llama-3.3-70B-Instruct*	70B
3	nvidia/Llama-3.1-Nemotron-70B-Instruct	70B
4	mistralai/Mistral-Nemo-Instruct-2407	12B
5	mistralai/Mistral-Small-24B-Instruct-2501*	24B
6	allenai/Llama-3.1-Tulu-3-70B	70B
7	Qwen/Qwen2.5-Coder-32B-Instruct*	32B
8	Qwen/Qwen2.5-72B-Instruct	72B
9	Qwen/QwQ-32B*	32B

Table 6: List of models used in our experiments. Model names match Hugging Face Hub identifiers. Number of parameters are in billions (noted *B*). Models kept for the automatic and manual evaluations are marked with *.

Prompt #1

The task involves rewriting a fragment of HTML content to produce an HTML fragment following the WCAG 2.1 guidelines and the W3C validator. The output must comply with the following rules: For the text, rewrite in French for a CEFR B1 level, write short sentences, follow a logical order of information, only one idea per sentence, avoid the passive form, address the person directly, use frequent words, don't use undefined abbreviations, do not use terms or jargon, reinforce the coherence of the textual content, replace conditions with questions (for example, "Si vous habitez à l'étranger, vous devez payer des frais.", "Vous habitez à l'étranger ? Vous payez des frais."). The output format must be HTML and must respect the following rules: Follow WCAG 2.1 and W3C guidelines, use bulleted lists to describe steps, 1.5 line spacing, line breaks after periods, insert a non-breaking space before punctuation marks with a space, bold important information such as dates and places, do not include images but instead describe input images in the output HTML content. Output a full and well-formed HTML page in a single <main> tag without header nor footer.

Prompt #2

Given an HTML snippet, your task is to transform it and output an HTML snippet which must follow the WCAG 2.1 and W3C guidelines, as well as the following mandatory rules: For the text, rewrite in French for a CEFR B1 level, write short sentences, follow a logical order of information, write only one idea per sentence, avoid the passive form, address the person directly, use frequent words, do not use abbreviations, terms or jargon, reinforce the coherence of the textual content, replace conditions with questions (for example, "Si vous habitez à l'étranger, vous devez payer des frais.", "Vous habitez à l'étranger ? Vous payez des frais."). Rules for the HTML: Follow WCAG 2.1 and W3C guidelines, use bulleted lists to describe steps, use 1.5 line spacing with CSS, use line breaks after periods, insert a non-breaking space before punctuation marks with a space, highlight and bold important information such as dates and places, do not include images but instead describe them in the content. Output a full and well-formed HTML page in a single <main> tag without header nor footer, no comments nor notes.

Prompt #3

Given an HTML snippet, your task is to transform it and output an HTML snippet without removing any information from the input. The output must follow the WCAG 2.1 and W3C guidelines, and the following rules: For the text, rewrite in French for a CEFR B1 level, write short sentences, follow a logical order of information, write only one idea per sentence, avoid the passive form, address the person directly, use frequent words, do not use abbreviations, terms or jargon, reinforce the coherence of the textual content, replace conditions with questions (for example, "Si vous habitez à l'étranger, vous devez payer des frais.", "Vous habitez à l'étranger ? Vous payez des frais."). Rules for the HTML: Follow WCAG 2.1 and W3C guidelines, use bulleted lists to describe steps, use 1.5 line spacing with CSS, use line breaks after periods, insert a non-breaking space before punctuation marks with a space, highlight and bold important information such as dates and places, do not include images but instead describe them in the content. Output a full and well-formed HTML page in a single <main> tag without header nor footer, no comments nor notes.

Figure 2: Variants of the best performing hand-crafted prompt used in our experiments.

UTILISER NOS SERVICES

Prêt et consultation

Pour emprunter un document, vous devrez posséder une **carte de bibliothèque valable**. Cette carte est personnelle et doit être présentée lors de chaque prêt. Elle vous permet d'emprunter dans l'ensemble des sites de la Bibliothèque de l'UNIGE, ainsi que dans les autres bibliothèques des réseaux SLSP (sans inscription supplémentaire) et **BibliOpas**. Si vous n'avez pas encore de carte, **inscrivez-vous** !

PRÊT

- La durée standard de prêt est de **28 jours**.
- Il est possible d'emprunter jusqu'à **100 documents** de la Bibliothèque de l'UNIGE sur son compte (hormis résident-es à l'étranger hors de la zone frontalière, max. 5 documents).
- Dans la plupart des cas, les documents sont **automatiquement prolongés** 5 fois leur durée de prêt initiale, pour autant qu'ils ne soient pas réservés par une autre personne ou que votre compte ne soit pas bloqué. Il n'est donc pas nécessaire de prolonger manuellement des documents empruntés.
- L'échéance de prêt des documents peut être consultée en tout temps via son compte sur **swisscovery** (menu "S'identifier").

RETOUR

- Les documents de la Bibliothèque de l'UNIGE peuvent être rendus sur n'importe quel **site** de la Bibliothèque de l'UNIGE, indépendamment de leur lieu d'origine.
- Les documents obtenus par le prêt entre bibliothèques (y compris dans le réseau SLSP) doivent être rendus sur leur lieu de retrait.
- Les documents empruntés physiquement auprès d'autres institutions (y compris dans le réseau SLSP) doivent être rendus où ils ont été empruntés.

DEMANDES ET RÉSERVATIONS

- Toutes les demandes se font en ligne, via le catalogue **swisscovery** (bouton "Prêt" → "Mon institution"/"Université de Genève").
- Une notification est envoyée par **email lorsque le document est prêt à être retiré**. Le délai pour venir le retirer est de 7 jours.
- Les documents suivants peuvent être demandés:
 - Documents **empruntés par une autre personne**: retrait uniquement sur le site d'origine du document
 - Documents **en magasin ou compactus** (= non accessibles au public); retrait uniquement sur le site d'origine du document
 - Documents du **Dépôt de la Bibliothèque de l'UNIGE** (DBU); retrait sur n'importe quel site de la Bibliothèque de l'UNIGE
 - Documents en prêt standard (28 jours) d'**Uni Bastions & Arve - Espace Battelle**: retrait uniquement sur le site Uni Bastions - Espace Jura.
- Tous les autres documents, en libre accès, doivent être cherchés en rayon et

CONSULTATION SUR PLACE

- La consultation sur place des documents est ouverte à toutes et tous. Une grande partie des collections est en libre-accès.
- Pour certaines collections, seule la consultation sur place et sur rendez-vous est autorisée:
 - **Astronomie**
 - **Histoire de la Réforme**
 - **CIGEV**

RETARDS ET FRAIS

- Les documents non rendus dans les délais engendrent des frais de retard, communs à l'ensemble du réseau SLSP:
 - 1 jour après l'expiration de la période de prêt: avis d'échéance gratuit
 - 6 jours après l'avis d'échéance: 1^{er} rappel payant: **5 CHF** par document
 - 6 jours après le 1^{er} rappel: 2^e rappel payant: **5 CHF** supplémentaires par document
 - 6 jours après le 2^e rappel: 3^e rappel payant: **10 CHF** supplémentaires par document
 - **A noter**: Pour les documents d'une durée de prêt plus longue que 28 jours

CONTACT

Uni Arve (Sciences)	biblio-arve@unige.ch
Uni Bastions	biblio-bastions-pret@unige.ch
Uni CMU	biblio-cmu@unige.ch Accueil: 022 379 51 00
Uni Mail	biblio-mail-pret@unige.ch 022 379 80 46

ACCÈS RAPIDE

[swisscovery UNIGE](#)
[Aide swisscovery](#)
[S'inscrire](#)
[Règlement d'utilisation des collections de la BUNIGE](#)
[Règlement d'utilisation des espaces](#)
[FAQ sur la facturation par SLSP pour les prestations payantes sur swisscovery](#)

 Figure 3: Original *Biblio* webpage

UTILISER NOS SERVICES

Comment emprunter des livres à la bibliothèque?

VOUS VOULEZ EMPRUNTER UN LIVRE À LA BIBLIOTHÈQUE?

Vous devez présenter une carte de bibliothèque valable et avoir un compte Swisscovery. Le compte Swisscovery vous permet d'accéder au catalogue en ligne des bibliothèques suisses.

- Vous êtes **étudiant-e** ou vous **travaillez** à l'UNIGE?
 - Vous utilisez votre carte multi-service comme carte de bibliothèque
 - Vous ouvrez le compte Swisscovery avec votre login étudiant-e SWITCH edu-ID.
- **Si vous n'avez pas de carte**, suivez les instructions sur la page «[S'inscrire](#)» de la bibliothèque.

QUELLES SONT LES RÈGLES?

- **Durée du prêt**
Vous pouvez en général garder un livre 28 jours.
- **Nombre de prêts maximum**
 - Vous vivez en Suisse ou dans la zone transfrontalière?
Vous pouvez emprunter 100 livres en même temps.
 - Vous vivez à l'étranger?
Vous pouvez emprunter 5 livres au maximum.
- **Date de retour**
Votre compte Swisscovery indique quand vous devez rendre un livre.
- **Prolonger le prêt**
Nous prolongeons le prêt **automatiquement 5 fois**. Il y a 2 exceptions: quelqu'un d'autre a réservé le livre ou nous avons bloqué votre compte.
- **Frais de retard**
Si vous êtes en retard pour rendre un livre, vous recevez un avertissement. Ensuite, vous devez payer des frais. Vous pouvez payer jusqu'à 20 francs par livre. De plus, nous pouvons bloquer votre compte.

Combien je dois payer si je n'ai pas rendu les livres à temps?

Si vous avez 1 jour de retard	Vous recevez un avertissement gratuit
Si vous avez 7 jours de retard	Vous payez 5 CHF par livre
Si vous avez 13 jours de retard	Vous payez 10 CHF par livre
Si vous avez 19 jours de retard	Vous payez 20 CHF par livre

- **Perte d'un livre**: si vous perdez un livre, vous payez des frais pour le remplacer.

COMMENT RETIRER UN LIVRE À LA BIBLIOTHÈQUE?

- **Le livre est dans les rayons**: vous venez à la bibliothèque, vous le prenez et vous allez au guichet.
- **Le livre n'est pas dans les rayons**: vous pouvez réserver certains livres en ligne avec votre compte Swisscovery. Vous recevez un e-mail quand le livre est disponible. Vous avez 7 jours pour venir le chercher.
 - Vous réservez un livre emprunté ou non accessible au public?
Vous venez le chercher dans la bibliothèque où il se trouve.
 - Vous réservez un livre dans le **Dépôt de la Bibliothèque de l'UNIGE (DBU)**?
Vous venez le chercher dans n'importe quelle bibliothèque de l'UNIGE.
- **Le livre n'est pas disponible dans une bibliothèque UNIGE**: vous devez utiliser le service de prêt inter-bibliothèque (PEB).

OÙ RENDRE LES LIVRES EMPRUNTÉS?

- Vous avez emprunté un livre de la bibliothèque de l'UNIGE?
Vous pouvez rendre le livre dans n'importe quelle bibliothèque de l'UNIGE.
- Vous avez commandé le livre dans une autre bibliothèque genevoise avec le service de prêt entre bibliothèques?
Vous le rendez là où vous l'avez pris.
- Vous êtes allé chercher le livre dans une autre bibliothèque de Suisse?

CONTACT

Uni Arve (Sciences) biblio-arve@unige.ch

Bibliothèque Ernst & Lucie Schmidheiny (BELS)
022 379 65 06

Astronomie (Observatoire)
022 379 22 13

Informatique (CUJ)
022 379 13 14

Mathématiques
022 379 11 56

Sciences de l'environnement (ISE)
022 379 07 75

Uni Bastions biblio-bastions-pre@unige.ch

Espace Jura
Littérature, Langues, Linguistique, Philosophie, Religion
022 379 13 13

Espace Battelle
Histoire, Histoire de l'art, Musicologie, Études est-asiatiques, Études mésopotamiennes, Egyptologie, Archéologie classique
022 379 13 14

Uni CMU biblio-cmu@unige.ch
Accueil: 022 379 51 00

Uni Mail biblio-mail-pre@unige.ch
022 379 80 46

ACCÈS RAPIDE

[swisscovery UNIGE](#)

[Aide swisscovery](#)

[S'inscrire](#)

[Règlement d'utilisation des collections de la BUNIGE](#)

[Règlement d'utilisation des espaces](#)

[FAQ sur la facturation par SLSP pour les prestations payantes sur swisscovery](#)

Figure 4: Manually simplified *Biblio* webpage

HORIZON ACADÉMIQUE

Inscription

INFORMATIONS GÉNÉRALES CONCERNANT L'ACCÈS À HORIZON ACADÉMIQUE

Critères d'admission au programme

	Critères d'admission	Exceptions aux critères d'admission
Lieu de domicile	Être domicilié-es dans le canton de Genève, sauf exception;	Les détenteur-trices d'un permis relevant du domaine de l'asile (soit un permis N, F, F-réfugié, B-réfugié, livret S) d'autres cantons que Genève, dont le projet d'études est soutenu par une institution d'aide sociale en Suisse, attesté par une lettre de l'institution et avoir un niveau minimum B1 certifié oral et écrit en français ou niveau B2 en anglais certifié pour les formations en anglais
Permis de séjour	Détenir soit un permis N, F, F-réfugié, B-réfugié ou un livret S, un permis B regroupement familial, soit être un-e ressortissant-e suisse de retour de l'étranger, sauf exception;	Les titulaires des permis CI ou carte de légitimation dans le cadre d'un regroupement familial et toute autre personne titulaire d'un autre permis de séjour, pour autant qu'elle soit orientée par le projet commun d'employabilité entre les communes genevoises, le BIC et l'OFPC.
Âge minimum	Être âgé de 18 ans révolus au plus tard le 1er septembre précédant la rentrée universitaire.	
Projet d'études	<p>Critère 1: Avoir un projet d'études UNIGE/HES-SO Genève/IHEID</p> <p>Critère 2: Avoir commencé et interrompu un cursus académique OU n'avoir pas pu commencer des études universitaires après avoir obtenu un titre école secondaire.</p> <p>Critère 3: Ne pas être en possession d'un master universitaire.</p> <p>En cas de refus suite à l'évaluation du projet d'études, la personne peut soumettre une nouvelle demande l'année suivante.</p>	<p>Exceptions pour le critère 3:</p> <ul style="list-style-type: none"> • Les personnes avec un métier réglementé • Les personnes visant un titre de doctorat • Sur dossier (validation d'expérience, reconversion professionnelle, etc.)
Niveau de français	Avoir un niveau de français A1 acquis, sauf exception;	Les personnes détentrices d'un permis F, F-réfugié, B-réfugié obtenu après le 1er mai 2019 sont admissibles à partir du niveau A0.
Établissement en Suisse	Vivre en Suisse depuis un maximum de 5 ans, sauf exception;	Un dépassement des 5 ans peut être accepté, en fonction des circonstances personnelles.
Barème RDU	Correspondre au barème du revenu déterminant unifié (RDU) exigible pour le Chèque annuel de Formation (CAF);	Le critère ne s'applique pas aux personnes détentrices d'un permis F, F-réfugié, B-réfugié obtenu après le 1er mai 2019.
Candidature	Avoir déposé une candidature complète en ligne et transmis les documents nécessaires dans les délais.	

Informations complémentaires:

Figure 5: Original *Horizon* webpage

HORIZON ACADÉMIQUE

Comment vous inscrire au programme Horizon académique?

Vous trouverez ici les informations utiles sur les conditions d'inscription au programme Horizon académique.

- Qui peut participer au programme Horizon académique?
- Comment vous inscrire au programme Horizon académique?
- Comment se passe la sélection?
- Quelles sont les étapes de la sélection pour l'année académique 2024-2025?
- Comment nous contacter?

QUI PEUT PARTICIPER AU PROGRAMME HORIZON ACADÉMIQUE?

Pour participer au programme Horizon académique, il y a des conditions. Nous vous présentons ces conditions.

1. Âge

Vous devez avoir **18 ans ou plus** (au plus tard le 1er septembre avant le début de l'année universitaire).

2. Lieu de domicile

Vous devez normalement **habiter à Genève**.

→ Vous n'habitez **pas** à Genève?

Vous pouvez quand même vous inscrire si vous respectez **les trois conditions suivantes** :

1. vous avez un permis lié à l'asile d'un autre canton que Genève (N, F, F-réfugié, B-réfugié ou livret S);
2. votre projet de formation à Genève est soutenu avec une lettre par l'aide sociale de votre canton;
3. vous avez au moins le niveau B1 de français ou B2 d'anglais. Niveaux confirmés par des certificats.

3. Résidence en Suisse

Vous devez normalement **être en Suisse depuis moins de 5 ans**.

→ Vous vivez en Suisse depuis plus de 5 ans?

Vous pouvez quand même vous inscrire. Nous examinons votre dossier.

4. Permis de séjour

Vous devez normalement respecter **une des deux conditions suivantes** :

- vous avez un permis N, F, F-réfugié, B-réfugié, livret S ou un permis B regroupement familial
- **ou** vous avez la nationalité suisse et revenez de l'étranger.

Vous pouvez demander une exception si :

- vous avez un permis Ci ou une carte de légitimation dans le cadre d'un regroupement familial
- **ou** vous avez un autre permis de séjour. Vous avez été redirigé vers nous par l'intermédiaire de votre commune genevoise de résidence, le BIC (bureau de l'intégration et de la citoyenneté) et l'OFPC (office pour l'orientation, la formation professionnelle et continue).

5. Formation

Vous devez respecter **les trois conditions suivantes** :

1. vous avez l'intention de vous former dans une haute école à Genève (Université de Genève, HES-SO Genève ou IHEID);
2. vous avez interrompu vos études ou vous n'avez pas pu commencer des études universitaires après avoir terminé l'école secondaire;
3. vous n'avez **pas** encore obtenu de master universitaire.
→ Vous avez déjà un master universitaire?
Vous pouvez quand même vous inscrire si:
 - vous avez une formation dans une profession réglementée
 - **ou** vous voulez faire un doctorat
 - **ou** votre situation le permet (validation d'expérience, reconversion professionnelle, etc.).

6. Niveau de français

Vous devez normalement **avoir un niveau de français A1**.

→ Vous n'avez pas ce niveau?

Vous pouvez quand même vous inscrire si vous avez un permis F, F-réfugié ou B-réfugié, reçu **après** le 1er mai 2019.

Figure 6: Manually simplified *Horizon* webpage