

# 000 001 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018 019 020 021 022 023 024 025 026 027 028 029 030 031 032 033 034 035 036 037 038 039 040 041 042 043 044 045 046 047 048 049 050 051 052 053 HISTOBENCH: WORLD HISTORY EVENT EXTRACTION AND COGNITIVE-LEVEL BENCHMARKING OF GENER- ATIVE AI

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## ABSTRACT

We present HistoBench, a benchmark and dataset designed to evaluate and improve large language models’ (LLMs) ability to reason about complex, temporally grounded historical narratives. While LLMs perform well on general language tasks, their historical understanding remains limited. HistoBench provides a richly annotated collection of global events, timelines, and causal chains, alongside an interactive timeline and global map to enhance accessibility for research and education. To assess reasoning across multiple depths, we introduce a set of 1,007 historical questions structured around Bloom’s Taxonomy, covering levels from factual recall (*Remember*) to higher-order reasoning (*Evaluate* and *Create*). Our results show that models perform well on spatial and entity recognition but struggle more with temporal reasoning. Among the evaluated systems, DeepSeek-V3 consistently outperforms GPT4o-mini and Gemma-3 across nearly all levels, achieving over 90% accuracy at the most advanced stages of evaluation and creation, highlighting its stronger capacity for complex historical reasoning.

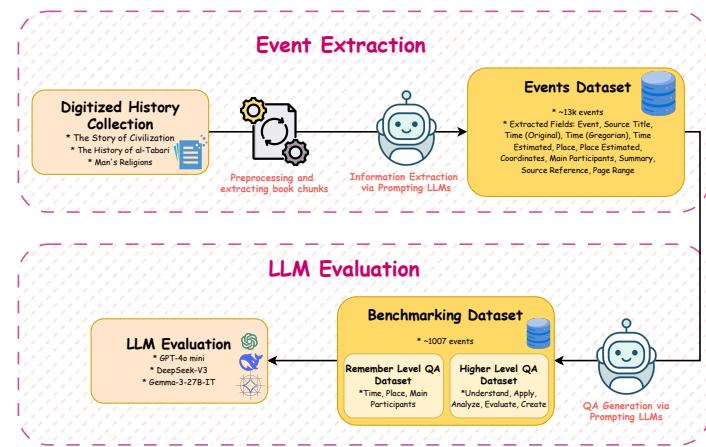
## 1 INTRODUCTION

The emergence of digital humanities over the last two decades has fundamentally transformed scholarship in the humanities, particularly in the field of history (Fafalios et al., 2023). Historical documents are now massively digitized into photos and texts, allowing researchers to query across collections and languages. This digitization has created an enormous volume of archives and archival data available digitally, producing a valuable but under-utilized source of large-scale digital data for digital humanities scholars (Hawkins, 2021). However, several challenges remain in this domain.

The challenges in the historical data analysis are as follows: **(i) Under-exploration of certain historical tasks:** One of the primary challenges in digital humanities is the under-exploration of certain historical tasks, particularly event extraction, which has either been applied to small-scale datasets or constrained by limited event typologies with predefined event categories (Rovera et al., 2019) (Hervieux et al., 2024). This limitation has restricted the broader application and generalizability of event extraction methods in historical research. **(ii) The lack of structured data:** Most historical texts are not in clean, structured formats suitable for direct computational analysis, therefore requiring extensive preprocessing before being usable in NLP pipelines (Wakabayashi, 2019). Available historical texts can be divided into three types from the point of automated text analysis: initially digital, printed/written but digitized, and non-digitized printed/written texts (Huistra & Mellink, 2016). In the case of solely printed or written texts, digitization is just the first step, as digitized text must be preprocessed to make it proper for automated analysis through steps like correction of Optical Character Recognition (OCR), concept or meta tagging, and lemmatization (Szabó et al., 2020). **(iii) Presenting large historical datasets:** While large-scale analysis of historical sources can provide a broader and more nuanced understanding of historical events, the sheer volume of extracted data can be overwhelming. For it to be useful, especially to non-experts, the data must be organized, filtered, and displayed in an accessible and user-friendly format. The scale and diversity of such collections presents particular challenges in identifying and extracting relevant content (Leavy et al., 2019). **(iv) Benchmarking Gaps in Historical Knowledge Evaluation:** Evaluating large language models on historical knowledge has become a key area of research as these systems are increasingly used for educational and informational purposes (Garcia & Weilbach, 2023). History

054 presents unique challenges for LLMs because it requires not just memorizing isolated facts, but un-  
 055 derstanding complex relationships between events, people, and time periods (Kandpal et al., 2023).  
 056 Moreover, our historical knowledge and the available digital data are heavily skewed toward West-  
 057 ern narratives, and this Western bias is also evident in the knowledge encoded by large language  
 058 models (Keleg & Magdy, 2023).

059 To address the first challenge, we employed large language models (LLMs) and used prompt en-  
 060 gineering techniques to perform tasks such as historical event extraction. To tackle the second  
 061 challenge, we developed a series of preprocessing steps, particularly tailored to the constraints and  
 062 nuances of feeding book-length texts into LLMs. To overcome the third challenge, we designed a  
 063 web-based user interface that enables users to visually explore and filter the extracted events through  
 064 interactive timelines and maps. Therefore, both academic researchers and non-specialist users can  
 065 benefit from the outputs. Scholars can use the platform for historical investigations across a wide  
 066 range of time periods and geographic regions, regardless of their specific area of expertise. In ad-  
 067 dition, the platform serves as an educational tool, accessible to general users with an interest in  
 068 learning about historical events and patterns. To address the forth gap, we curated a dataset of 1,007  
 069 multiple-choice questions derived from the structured historical data extracted from our source texts.  
 070 This dataset covers a wide variety of time periods and regions, enabling a fair and representative  
 071 evaluation. We then used it to benchmark the historical understanding of several state-of-the-art  
 072 LLMs, providing new insights into their performance and limitations in processing historical con-  
 073 tent. Figure 1 provides a visual overview of the event extraction process and large language model  
 074 (LLM) evaluation pipelines in our work.



090 Figure 1: An overview of our pipeline for historical event extraction and evaluation. The top section  
 091 illustrates how structured event data is extracted from digitized historical texts using LLMs. The  
 092 bottom section shows how the resulting dataset is used for evaluating LLMs across multiple reason-  
 093 ing levels based on Bloom’s Taxonomy.

## 094 2 RELATED WORK

095 **Event Extraction:** A common approach in the task of event extraction has been to decompose it  
 096 into smaller subtasks. For example, (Nguyen & Grishman, 2018) employs Graph Convolutional  
 097 Networks (GCNs) to perform event detection, which involves identifying whether a specific event  
 098 occurs within a given text. Another example is GRIT (Du et al., 2021), which uses a transformer-  
 099 based model to extract entities related to events.

100 Subsequent work in event extraction has largely framed the task as a classification problem, often fo-  
 101 cusing on identifying and categorizing event triggers—words that explicitly indicate the occurrence  
 102 of an event, typically the main verb in a sentence. This approach is based on annotation guidelines  
 103 such as those provided by the ACE dataset (ACE), which defines and categorizes event types. For  
 104 example, Sprugnoli and Tonelli (Sprugnoli & Tonelli, 2019) introduced an annotation scheme that  
 105 classifies events into 22 categories and created a dataset with these annotations, along with a model

108 to automate the annotation process. The BRAD dataset (Lai et al., 2021) is another relevant example.  
 109 It contains annotated historical texts related to Black uprisings found in 19th-century African  
 110 American newspapers. The study reported that existing models, based primarily on BERT, struggled  
 111 to perform well on this dataset.

112 A significant shift in methodology came with research showing that framing event extraction as a  
 113 question answering (QA) task yields promising results [liu-etal-2020-event]. Follow-up studies have  
 114 validated the effectiveness of this approach. For instance, (Borenstein et al., 2023) introduced a multi-  
 115 lingual dataset based on early modern colonial-era newspaper advertisements that document formerly  
 116 enslaved individuals who liberated themselves. Using a QA-based approach with RoBERTa  
 117 models, they achieved strong results on these historical texts.

118 However, these prior works have notable limitations: the questions are typically handcrafted, the  
 119 tasks are limited to specific event types, and the datasets are small in scale and narrowly focused.  
 120 Given the demonstrated success of QA formulations for event extraction, the emergence of large  
 121 language models (LLMs) presents a powerful opportunity. These models inherently operate well  
 122 in QA-like formats and enable large-scale, high-accuracy event extraction across diverse historical  
 123 texts, without being constrained by fixed event taxonomies.

124 **Visualizing Historical Events:** In terms of visualizing historical events on a timeline, relatively  
 125 few studies have addressed this challenge. Bedi et al. (Bedi et al., 2017) utilized the TimeMapper tool  
 126 (<https://timemapper.okfnlabs.org/>) for this purpose, using the NER component of  
 127 Stanford CoreNLP (Manning et al., 2014) to extract events. However, their extracted events were  
 128 limited in scope, based on only around 200 sentences. Another study by Hienert et al. (Hienert &  
 129 Luciano, 2012) worked with a larger dataset spanning from 300 BC to 2013. Their dataset was  
 130 derived from structured data on Wikipedia, where events are already listed in chronological format  
 131 on dedicated pages. Their work focused primarily on building a pipeline for event extraction and  
 132 visualization from this semi-structured source.

133 **Historical Benchmarking for LLMs:** General-purpose evaluation benchmarks like  
 134 MMLU (Hendrycks et al., 2021) are widely adopted across numerous academic domains, including  
 135 history, as proxies for assessing large language models’ reasoning and encyclopedic  
 136 knowledge. However, these benchmarks are not tailored to the unique demands of historical  
 137 reasoning: they do not offer contextual narrative structure, causal chaining, or temporally grounded  
 138 evaluation specific to history, motivating the need for a domain-specific dataset.

139 Dedicated historical and temporal reasoning benchmarks have made important progress, but each  
 140 exhibits key limitations. HiST-LLM, built from the Seshat Global History Databank, provides structured  
 141 coverage of historical societies from the Neolithic to the Industrial Revolution, but emphasizes  
 142 basic factual recall and lacks systematic alignment with cognitive levels like analysis or evaluation  
 143 (Hauser et al., 2024). HistBench, developed alongside the HistAgent platform, offers multilingual and  
 144 multimodal historical QA, yet remains limited in scale (hundreds of questions) and does not integrate  
 145 Bloom’s Taxonomy to balance cognitive complexity across tasks (Qiu et al., 2025). Temporal reasoning  
 146 benchmarks such as TRAM (Wang & Zhao, 2024) and TimeBench (Chu et al., 2024) provide broad  
 147 coverage of tasks involving ordering, duration, frequency, arithmetic, and some aspects of causality.  
 148 Nonetheless, they lack support for causal-chain visualizations and structured narrative event  
 149 extraction, and similarly omit a systematic approach to cognitive-level design.

150 In contrast, our work addresses these gaps by delivering (1) broad temporal and geographic representation  
 151 of extracted events; (2) an interactive, map-based visualization interface; and (3) a deliberately  
 152 designed set of 1,007 multiple-choice questions, crafted according to Bloom’s Taxonomy to span  
 153 remembering through creating cognitive levels. This enables more interpretable and cognitively  
 154 informed evaluation of LLM historical reasoning.

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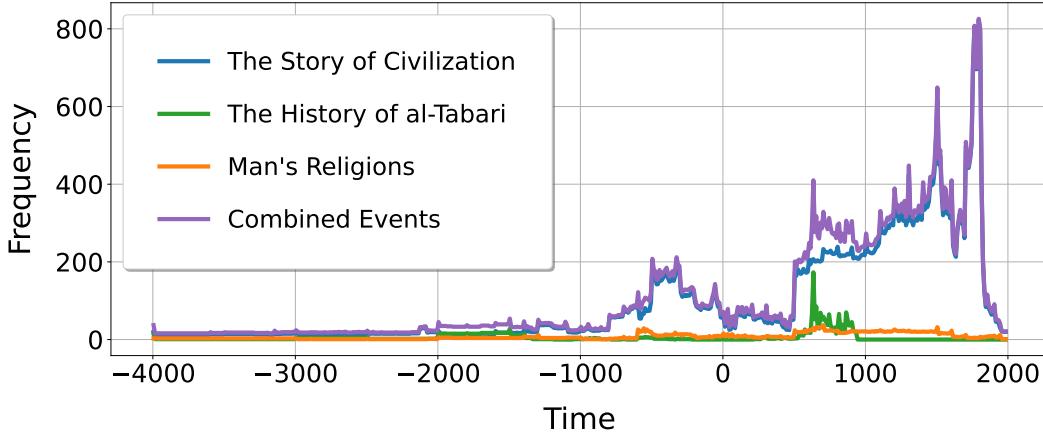
163 Table 1: Basic quantitative statistics of the selected historical texts, including total pages, word  
164 counts, and character counts

165

Book	Pages #	Words #	Characters #
The Story of Civilization	9,570	4.24M	24.7M
The History of al-Tabari	6,166	1.63M	8.11M
Man's Religions	768	0.30M	1.76M
<b>Total</b>	<b>16,504</b>	<b>6.17M</b>	<b>34.6M</b>

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188 Figure 2: Temporal distribution of events in the full dataset, categorized by source texts: The Story  
189 of Civilization, The History of al-Tabari, and Man's Religions.

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## 3 DATASET

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## 3.1 EVENTS DATASET

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195 We analyzed three major historical texts<sup>1</sup> to extract a wide range of world events, aiming to broaden  
196 the geographic and cultural scope beyond a predominantly Western focus. Some information about  
197 the size of these resources is provided in Table 1, which summarizes the number of pages, words,  
198 and characters for each book as well as their combined totals. Our resources include:

199

200 **The Story of Civilization**, an 11-volume series by Will and Ariel Durant (1935–1975), traces the  
201 broad sweep of world history from prehistoric times through the Napoleonic era in 1975. While  
202 it covers both Eastern and Western civilizations, the narrative foregrounds European and Western  
203 developments, weaving together political, cultural, and intellectual histories with storytelling for a  
204 general readership (Durant, 1942). For detailed volume-specific distributions, see Figure 5 (temporal  
205 distribution of events) in the Appendix.

206

207 **The History of al-Tabari** (also known as *Tarikh al-Rusul wa al-Muluk*), compiled by Ibn Jarir  
208 al-Tabari and completed in 915CE, is an 11-volume annalistic chronicle beginning with creation  
209 and covering ancient empires, prophetic traditions, and Islamic history through to the early Abbasid  
210 caliphate. It offers an in-depth account of Middle Eastern history up to 915CE, with particular  
211 emphasis on Persian and early Islamic narratives (al Tabari & Rosenthal, 1988). The original text  
212 is in Arabic, and we conducted our analysis directly on the Arabic version to avoid potential issues  
213 introduced by translation nuances.

214

215

<sup>1</sup>We used three major historical works: *The Story of Civilization*, *The History of al-Tabari*, and *Man's Religions*, to enrich our dataset. No copyrighted text was reproduced; all historical content was paraphrased and fully attributed. This use aligns with standard academic fair-use (U.S.) and fair-dealing (U.K. and similar jurisdictions) practices, which permit paraphrasing factual material for non-commercial scholarly research provided attribution is given and no substantial portions of original expression are copied.

216 **Man’s Religions** (by John B.Noss; revised edition c.1980s; originally early 1960s editions) is a  
 217 single-volume comparative overview of global belief systems. It is organized in four thematic sec-  
 218 tions: primitive and extinct religions, religions of India, religions of East Asia, and religions of the  
 219 Middle East, and provides factual, comparative descriptions of each tradition’s history, beliefs, and  
 220 practices (Noss, 1956).

221 Drawing on these sources and after the aggregation process, the resulting dataset includes **13,233**  
 222 **historical events**, categorized as follows: 11,176 from *The Story of Civilization*, 1,570 from *The*  
 223 *History of al-Tabari*, and 487 from *Man’s Religions*. The temporal distribution of these events is  
 224 illustrated in Figure 2, which shows a higher density in the last 1,500 years. Each extracted event in  
 225 our dataset is represented using the structured fields detailed in Table 2.

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 227  
 228 Table 2: Universal data schema for historical events  
 229

230 <b>Field</b>	231 <b>Description</b>
231 <b>Event</b>	232 A short title or description of the event
232 <b>Source title</b>	233 Title of the event as it appears in the original text (if 234 applicable)
233 <b>Time (original)</b>	235 Temporal description of the event as provided by the 236 source
235 <b>Time (gregorian)</b>	237 Normalized year in the Gregorian calendar (negative 238 for BCE, positive for CE)
237 <b>Time estimated</b>	239 Boolean flag: <code>true</code> if inferred, <code>false</code> if explicitly 240 given in the source
239 <b>Place</b>	241 Name of the geographical location where the event oc- 242 curred
241 <b>Place estimated</b>	243 Boolean flag: <code>true</code> if inferred, <code>false</code> if stated in the 244 source
243 <b>Coordinates</b>	245 Standardized latitude and longitude of the location
245 <b>Main participants</b>	246 Key individuals or groups involved in the event
246 <b>Summary</b>	247 A concise summary of the event, optionally generated 248 by a language model
247 <b>Source reference</b>	249 Name and volume of the source
249 <b>Page range</b>	251 Start and end pages of the event in the source material

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 255 3.2 BENCHMARKING DATASET  
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257 To evaluate the performance of large language models (LLMs), we constructed a balanced bench-  
 258 marking subset derived from our large-scale event dataset.  
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260  
 261 3.2.1 EVENT SELECTION  
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263 From the full corpus of 13,233 historical events, we selected a representative subset of 1,007 in-  
 264 stances, ensuring coverage across diverse geographic regions, historical periods, and thematic do-  
 265 mains. The dataset size was intentionally limited to a scale feasible for manual verification, thereby  
 266 supporting the correctness and reliability of the benchmark. The distribution of the selected events is  
 267 visualized in Figure 3, which demonstrates a similar distribution pattern between the full dataset and  
 268 the benchmarking subset. Events from earlier historical periods are depicted in blue, transitioning to  
 269 red for more recent events. Furthermore, areas with greater event density are represented with more  
 intense colors, highlighting regions of significant historical concentration.

270 3.2.2 FACTUAL BENCHMARKING (LEVEL: REMEMBER)  
271

272 Each of the 1,007 selected events was input into GPT-4o Mini to generate three multiple-choice  
273 questions, corresponding to the fields of time, place, and main participants. These questions were de-  
274 signed to assess the model’s factual recall and knowledge retention. Only events that were answered  
275 correctly by all models across these three questions were retained for higher-level benchmarking.

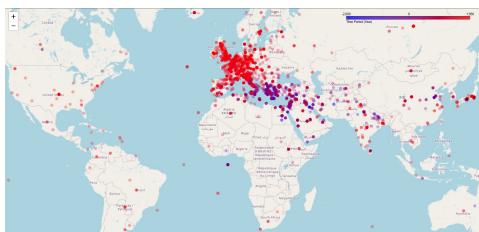
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277 3.2.3 HIGHER-ORDER BENCHMARKING VIA BLOOM’S TAXONOMY  
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279 To assess deeper historical reasoning beyond factual recall, we adopted Bloom’s Taxonomy, a widely  
280 recognized framework for classifying educational learning objectives into six hierarchical cognitive  
281 levels (Anderson & Krathwohl, 2001). At the foundational level, *Remember* targets the retrieval of  
282 factual knowledge, such as dates, names, or specific events. The next level, *Understand*, involves  
283 grasping the meaning of historical content, such as summarizing a passage or interpreting a source.  
284 *Apply* requires learners to use historical knowledge in new contexts, for example, relating a past  
285 conflict to a contemporary situation. At a more advanced stage, *Analyze* focuses on breaking down  
286 historical narratives into components, identifying causes, effects, and relationships. The *Evaluate*  
287 level asks learners to make informed judgments, such as critiquing a historical decision or comparing  
288 the reliability of multiple sources. Finally, *Create* represents the highest cognitive level, involving  
289 the synthesis of new ideas or narratives based on historical understanding, such as constructing  
290 a counterfactual scenario or proposing an alternative interpretation of an event. This taxonomy  
291 informed the design of our evaluation framework, allowing us to probe different depths of reasoning,  
292 from simple recall to complex historical synthesis.

293 **Question Generation Process:** From the original set of 1,007 events, we first identified a subset of  
294 394 events for which all tested models correctly answered the factual (i.e., “Remember” level) ques-  
295 tions. For each of these events, we then generated five multiple-choice questions, each aligned with  
296 one of the higher-order levels of Bloom’s Taxonomy: *Understand*, *Apply*, *Analyze*, *Evaluate*, and  
297 *Create*. The initial versions of these questions were produced using the GPT-4o Mini model. Sub-  
298 sequently, the questions were refined and their cognitive complexity enhanced using the DeepSeek  
299 model to ensure greater depth and challenge across the higher taxonomy levels.

300 This structured approach enables a comprehensive evaluation of LLMs across both lower and higher  
301 order cognitive skills in the domain of historical reasoning.



302 (a) Geographic distribution of the full event  
303 dataset.  
304



305 (b) Geographic distribution of the benchmarking  
306 subset.  
307

308 Figure 3: Comparison of the geographic distributions in the full dataset and the benchmarking sub-  
309 set. Time is visualized using a gradient from blue (older events) to red (more recent events). The  
310 density of events in each geographic area is represented by color intensity, highlighting historically  
311 rich regions.

312

313 4 METHODOLOGY  
314315 4.1 DATASET PREPARATION AND PREPROCESSING  
316

317 We utilized digitized versions of three major historical texts: *The Story of Civilization* (Durant,  
318 2016), *The History of al-Tabari* (al Tabari, 1967), and *Man’s Religions*, the latter of which was  
319 digitized using Optical Character Recognition (OCR). Preprocessing involved cleaning the raw text

324 and segmenting each book into smaller, coherent chunks. Each chunk was given a descriptive title  
 325 and annotated with its start and end page numbers, based on a structural analysis of the text.  
 326

## 327 4.2 EVENT EXTRACTION 328

329 We employed GPT-4 (32k context window) via prompt engineering to extract historical events from  
 330 the preprocessed chunks. Two major challenges emerged in this process:

331 **(i) Missing temporal and spatial information:** In many cases, events lacked time or location  
 332 data, both of which are essential for visualization on a temporal-spatial map. This issue stemmed  
 333 either from limitations in the model’s extraction capabilities or the absence of such details in the  
 334 source text. To mitigate this, each prompt included both the target text segment and a set of recently  
 335 extracted events to provide historical context. When time or place was not explicitly mentioned, the  
 336 model was instructed to infer it based on its training data. A separate field was added to indicate  
 337 whether this information was inferred (True) or directly stated (False).

338 **(ii) Standardization of extracted fields:** For consistency and usability, temporal data was converted  
 339 into numeric formats (e.g., years, centuries), and spatial data into geographic coordinates (latitude  
 340 and longitude). To support this, two additional fields were defined in the model prompt to extract  
 341 standardized versions of time and location directly.

## 343 4.3 EVALUATION OF EXTRACTED EVENTS 344

345 To assess the quality of the extracted event dataset, a random sample of 50 events was selected  
 346 for manual verification. Two independent evaluators reviewed each event’s fields—including time,  
 347 place, main participants, and others—labeling them as correct or incorrect based on careful exam-  
 348 ination of the original text and additional historical sources. Table 3 presents the results of this  
 349 evaluation, including individual assessments and their average, demonstrating strong overall per-  
 350 formance with an average accuracy of 94.1%. Notably, the standardization of place information  
 351 exhibited slightly lower accuracy, reflecting challenges in precisely identifying geographical co-  
 352 ordinates. These results indicate that the dataset is both robust and reliable for capturing critical  
 353 historical event information.

354 Table 3: Evaluation of extracted events based on annotations by two dependent human annotators  
 355

	time	time estimated	time standard	place	place estimated	place standard	main participants	pages	total
annotator 1	90%	96%	98%	94%	100%	88%	96%	100%	95.25%
annotator 2	88%	96%	88%	94%	98%	88%	98%	94%	93%
average	89%	96%	93%	94%	99%	88%	97%	97%	94.125%

## 361 4.4 LLM EVALUATION 362

363 We evaluated the performance of three large language models: GPT-4o Mini (OpenAI et al., 2024),  
 364 DeepSeek-V3 (DeepSeek-AI et al., 2025), and Gemma-3-27B-IT (Team et al., 2025). Evaluation  
 365 proceeded in two stages:

366 **Factual Benchmarking (Remember level):** Each model was assessed using three multiple-choice  
 367 questions per event, targeting the fields of time, place, and main participants.

368 **Higher-Order Reasoning Benchmarking:** Events for which all three models answered correctly  
 369 at the factual level were selected to generate more advanced questions. These were mapped to the  
 370 upper levels of Bloom’s Taxonomy (*Understand, Apply, Analyze, Evaluate, and Create*) to evaluate  
 371 the models’ deeper historical reasoning capabilities.

## 373 5 RESULTS 374

375 For each multiple-choice question, the model’s response was evaluated against the ground truth to  
 376 determine its correctness. Overall accuracy was then calculated based on the proportion of correct  
 377 responses. Table 4 presents the performance of the three models at the *Remember* level, while

378 Table 5 reports their results across the remaining five levels of Bloom’s Taxonomy. They offer a  
 379 detailed view of how different large language models perform across various dimensions of historical  
 380 understanding. Below are several key insights drawn from the evaluation data:  
 381

382 **Overall Performance Levels.** (1) All models generally perform better on higher-order cognitive  
 383 tasks (like *Evaluate* and *Create*) compared to the *Remember* and *Understand* levels. (2) *DeepSeek-*  
 384 *V3* consistently outperforms *GPT4o-mini* and *Gemma-3* across nearly all categories and Bloom’s  
 385 levels, indicating stronger historical reasoning and comprehension capabilities.  
 386

387 **Remember Level (Table 4).** (1) Models excel in recognizing *Place* and *Main Participants*, with  
 388 accuracy around 90% or above, while performance on *Time* is considerably lower (66.5%–75.9%).  
 389 This suggests temporal understanding remains more challenging than spatial or entity recognition  
 390 at the factual recall level. (2) *DeepSeek-V3* leads on all three *Remember* subcategories, pushing its  
 391 total accuracy to 88.65%, about 5 percentage points higher than the other two models.  
 392

393 **Higher-Order Cognitive Levels (Table 5).** (1) Accuracy improves progressively from *Under-*  
 394 *stand* (approximately 74–84%) to *Evaluate* and *Create* levels (approximately 79–92%), demon-  
 395 strating that models can perform well on complex reasoning tasks when provided with structured  
 396 historical data. (2) *DeepSeek-V3* again ranks highest across all five levels, exceeding 90% accuracy  
 397 at *Evaluate* and *Create*, suggesting a better grasp of complex historical concepts and analysis. (3)  
 398 *Gemma-3* trails behind *GPT4o-mini*, especially at the *Apply*, *Analyze*, *Evaluate*, and *Create* levels,  
 399 indicating weaker performance in applying and synthesizing historical information.  
 400

401 Table 4: Model performance at the remember level, showing the number of correct answers along-  
 402 side the corresponding accuracy percentages  
 403

model	time	place	main participants	total
gpt4o-mini	670 (66.534%)	911 (90.466%)	943 (93.644%)	83.55%
deepseek-v3	764 (75.868%)	955 (94.836%)	959 (95.233%)	88.65%
gemma-3-27b-it	704 (69.911%)	911 (90.466%)	916 (90.963%)	83.78%

412 Table 5: Model performance on higher-order levels (bloom’s taxonomy), showing the number of  
 413 correct answers alongside the corresponding accuracy percentages  
 414

model	understand	apply	analyze	evaluate	create
gpt4o-mini	298 (75.63 %)	327 (82.99 %)	348 (88.32 %)	357 (90.60 %)	349 (88.57 %)
deepseek-v3	332 (84.26 %)	335 (85.02 %)	351 (89.08 %)	364 (92.38 %)	362 (91.87 %)
gemma-3-27b-it	291 (73.85 %)	301 (76.39 %)	312 (79.18 %)	327 (82.99 %)	311 (78.93 %)

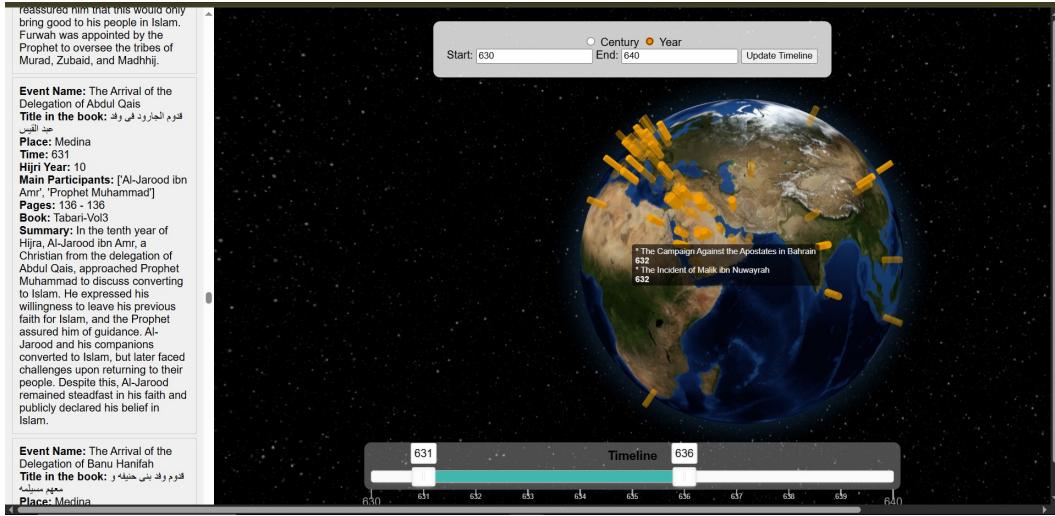
## 6 VISUALIZATION

425 To facilitate the exploration of the extracted historical events, we developed a web-based visual-  
 426 ization platform featuring an interactive 3D globe. Users can select specific time intervals, by  
 427 year or century, and view the corresponding events geographically displayed on the globe. An  
 428 adjustable timeline is provided to further refine the temporal range and dynamically update the dis-  
 429 played events.

430 The intensity of the color bars on the map increases with the number of events associated with  
 431 a given location; higher event density results in more saturated color markers. By hovering over  
 a location, users can access a tooltip displaying detailed information about the associated events.

432 Additionally, a side panel presents a scrollable list of all currently filtered events, allowing for easier  
 433 navigation and inspection.

434  
 435 This visualization platform is implemented using HTML and JavaScript, with the support of the  
 436 Globe.GL library<sup>2</sup>, a UI component built on Three.js/WebGL for interactive geographic data visu-  
 437 alization. A screenshot of the interface is shown in Figure 4.



455 Figure 4: An example visualization of historical events on the interactive globe interface.  
 456  
 457

## 458 7 CONCLUSION

459  
 460 This paper introduced *HistoBench*, a comprehensive benchmark and dataset aimed at evaluating  
 461 large language models' (LLMs) capabilities in understanding temporally grounded and context-rich  
 462 historical narratives. By extracting and structuring over 13,000 events from diverse historical texts,  
 463 we not only broadened the geographic and cultural scope of available historical datasets but also  
 464 enabled meaningful analysis through an interactive globe-based visualization interface. Further-  
 465 more, we constructed a cognitively balanced benchmark of 1,007 multiple-choice questions, guided  
 466 by Bloom's Taxonomy, to assess both factual recall and higher-order reasoning in history-focused  
 467 tasks.

468 Our evaluation of three leading LLMs revealed notable performance differences across cognitive  
 469 levels and question types, with DeepSeek-V3 demonstrating superior accuracy and reasoning con-  
 470 sistency. These findings highlight both the potential and current limitations of LLMs in processing  
 471 complex historical content. Further work may explore expanding the dataset to cover a broader  
 472 range of cultures and historical traditions, as well as extracting additional layers of information,  
 473 such as historical figures, their relationships, and interconnections, to enable more advanced forms  
 474 of contextual and relational reasoning in historical language understanding.

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<sup>2</sup><https://globe.gl/>

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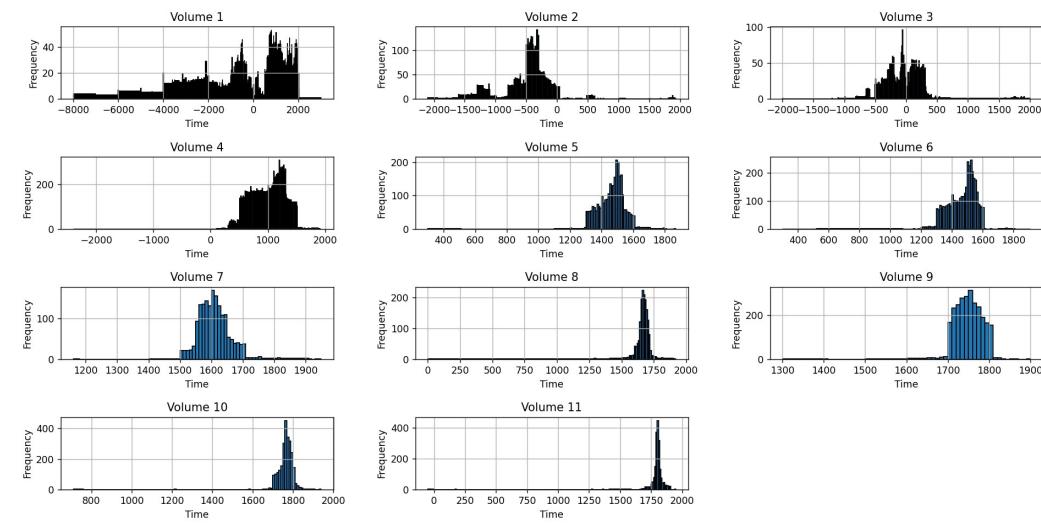
756 **A APPENDIX**  
757

Figure 5: Bar chart showing the temporal distribution of extracted events by volume.