LECTAUREP: Paris Notary Record Books Automated Reading

Alix Chagué, Aurélia Rostaing

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Paris Notary Record Books Automated Reading

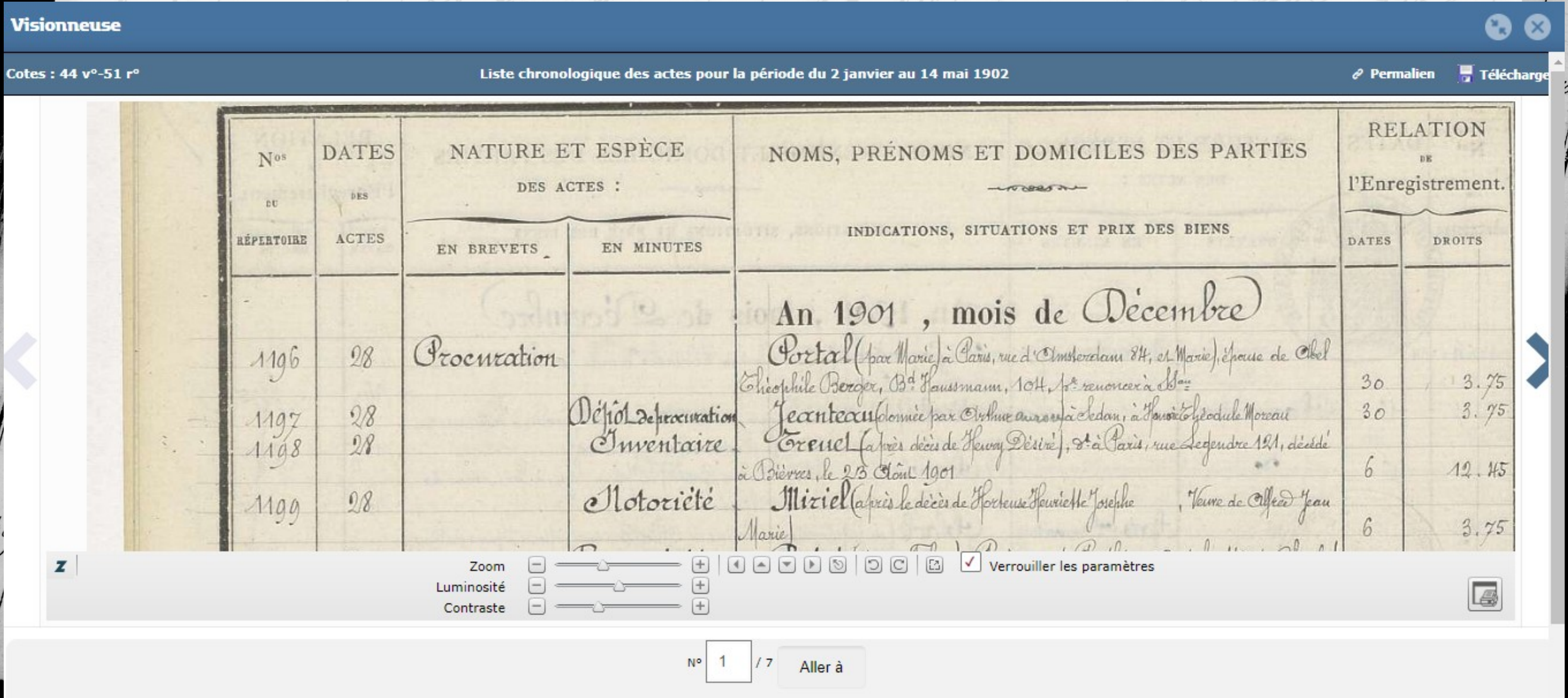
FF21 - BnF - 10/12/2021

Alix Chagué (Inria, Université de Montréal)
Aurélia Rostaing (Archives nationales)

Inria
ARCHIVES NATIONALES
MINISTÈRE DE LA CULTURE
Liberté
Égalité
Fraternité

LECTAUREP’s perimeter

B/W & colored digitizations of notary record books, 1803-1940s



Stakes

Help end-users read, search, mine notarial registers

> Turn massively digitized archives into data through AI (recurrent neural networks - LSTM)

Serve GLAM communities, academics, genealogists, HTR/AIS/LIS SPs

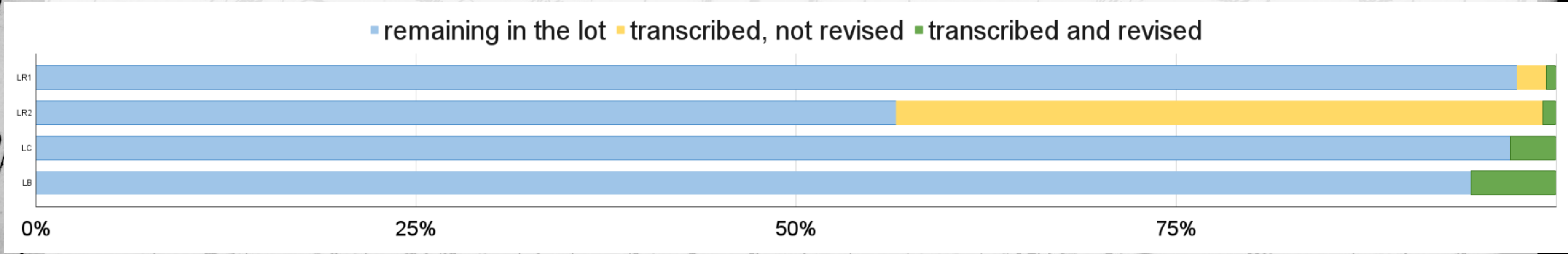
> Mutualize & document data, models, platform, methods for interoperability purposes

Consider **digital heritage** as a whole

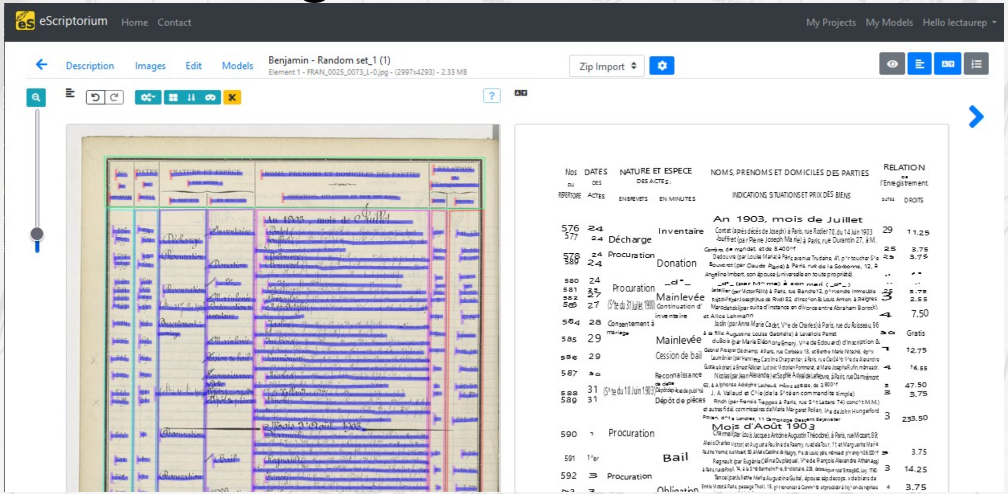
> Take into account B&W digitized microfilms & digitization from the original

Sample sets

	Images	Dates	Notaries	Notary Studies	Hands	Hands	Size (Go)	Target (p.)	Lots (p.)	Transcribed (p.)	Revised (p.)
Lot Rép. 1	b/w	1803-1907	12	4	~50	~16	11.6	~174 840 ?	20 800	533	138
Lot Rép. 2	col.	1889-1943	~100	~57	~200	~100	3.75	~1 M ?	1844	800	16
Lot CM-SD	col.	1829-1934	N/A	N/A	~30	~10	42.5	20 000	600	600	218
Lot Bronod	col.	1719-1760	1	1	1	1	1.2	3595	200	200	200



Technological environment

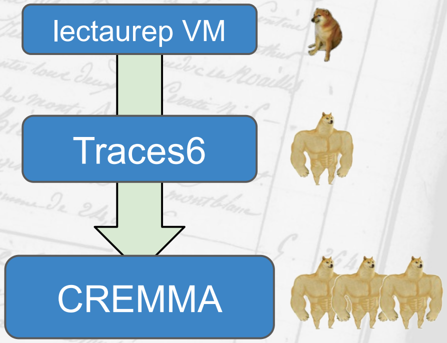


Software

- **Kraken** - open source HTR engine developed by Ben Kiessling since 2015
- **eScriptorium** - open source web application developed by SCRIPTA PSL since 2018

Hardware

- 2019 - lectaurep.paris.inria.fr (no GPU, virtual machine)
- 2020 - traces6.paris.inria.fr (2 GPU, more storage)
- 2021-2022 - escriptorium.cremma.fr (better architecture, + 2 GPUs, more storage, more RAM)



Contractual deliverables

Models

- 1 perfectible model for line detection
- 1 perfectible model for region detection
- at least 4 usable models for text recognition
  - 2 generics (several hands): “Generic” (9 %) & “Random Set” (10 %)
  - 2 specialized (1 hand): “Bronod” (5 %) & “Contrats de Mariage” (3 %)

Documentation

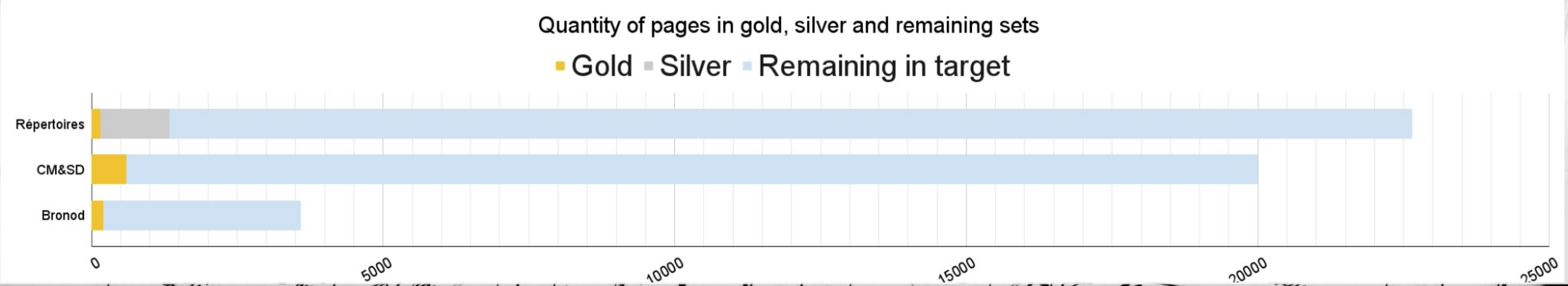
- Transcription conventions & good practices
- Open Science and Gitlab/Github environments (issues and codes)

Contractual deliverables

Data

- 239 images (31 401 lines) gold transcription published and documented as ground truth on HTR-United
  - from Répertoires, CM/SD and Bronod
  - additional publication on data.archives-nationales.culture.gouv.fr?
  - 333 more pages ready to join HTR-United

- 1561 images of silver transcription awaiting revision



Bonus deliverables

Scripta-PSL

- Providing use cases and feedback
- Developing features for eScriptorium (document tags, dashboard…)
- Creating general documentation for eScriptorium (tutorial)

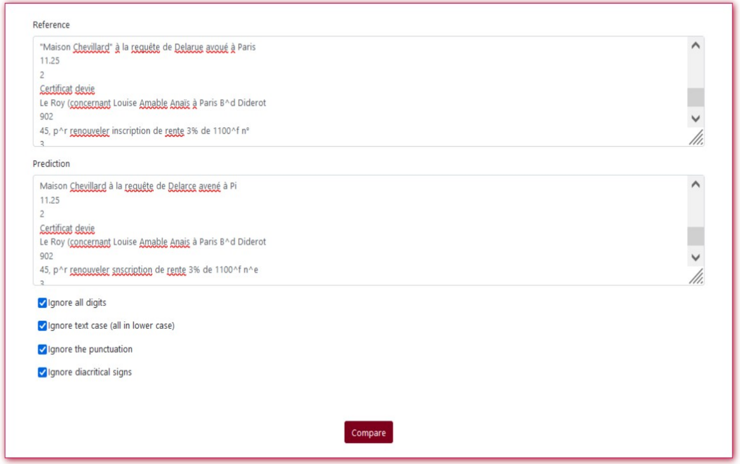
GLAM & academics

- Sharing expertise with users, project carriers and working groups (smaller projects, CREMMALab, AI4LAM)
- Sharing expertise via scientific publication (Hypotheses blog)

KaMI: metrics from the lab to the field

A tool to better evaluate the performances of HTR models with:

- filters (digits, punctuation, diacritics, lower/upper case, etc.)
- more metrics (CER, WER, hit and substitutions or deletions, etc.).
- KaMI is agnostic (not limited to Kraken)

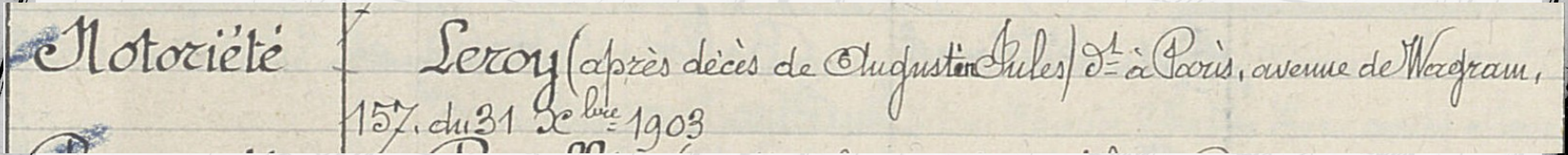


	Default	Ignoring digits	Ignoring case	Ignoring punctuation	Ignoring diacritics	Combining all options
Levensthein Distance (Char.)	440	433	433	421	210	178
Levensthein Distance (Words)	228	216	224	219	130	99
Hamming Distance	Ø	Ø	Ø	Ø	Ø	Ø
Word Error Rate (WER)	30.645	33.333	30.107	29.514	17.473	16.202
Char. Error Rate (CER)	9.596	10.253	9.443	9.57	4.554	4.38
Word Accuracy (Wacc)	69.354	66.666	69.892	70.485	82.526	83.797
Match Error Rate (MER)	9.333	9.949	9.183	9.297	4.538	4.363
Char. Information Lost (CIL)	13.52	14.385	13.196	13.425	6.203	5.75
Char. Information Preserved (CIP)	86.479	85.614	86.803	86.574	93.796	94.249
Hits	4274	3919	4282	4107	4417	3901
Substitutions	204	200	195	193	78	57
Deletions	107	104	108	99	116	105
Insertions	129	129	130	129	16	16

A corpus raising challenges for NLP-ists

A corpus of text with strong potential to raise new challenges for NLP due to its specificities

- many abbreviations
- many named entities
- non verbal sentences

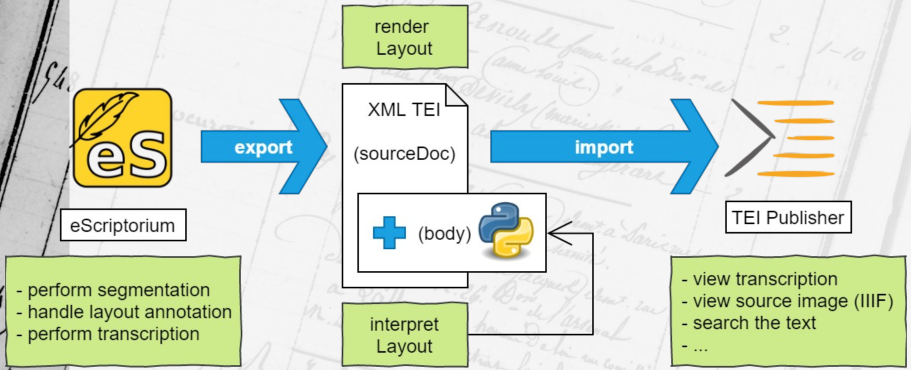


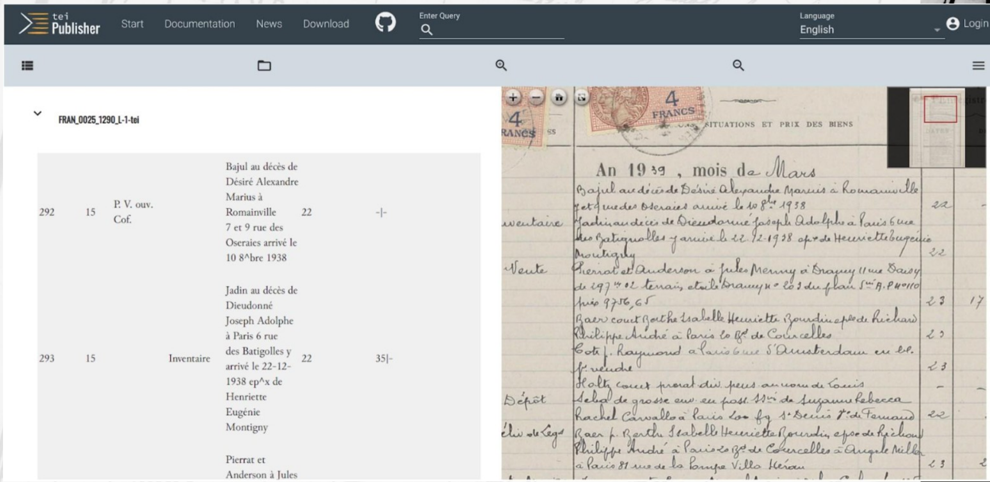
Notoriété | Leroy (après décès de Augustin Jules) demeurant à Paris, avenue de Wagram, 157, du 31 décembre 1903.”

Affidavit | Leroy (after death of Augustin Jules) dwelling in Paris, avenue de Wagram, 157, on December 31st 1903.

Towards TEI XML and TEI Publisher

- More systematic usage of TEI XML in the pipeline
- Displays documents with complex layout in simple interface
- Benefits from viewing IIIF facsimile and search feature in tools like TEI Publisher





Conclusion

Generic HTR models enable fuzzy search in loose lines (B/W 19th c. & part of col. 20th c.).

Segmentation models need to be upgraded in case of tight lines (large part of col. 20th c.).

A segmentation rating tool could be handy.

Target corpus: 3100 notary record books (~14% color)

~1,2 M pages, ~1000s handwritings, 1803-1940s (sample transcribed: 1,11 ‰)

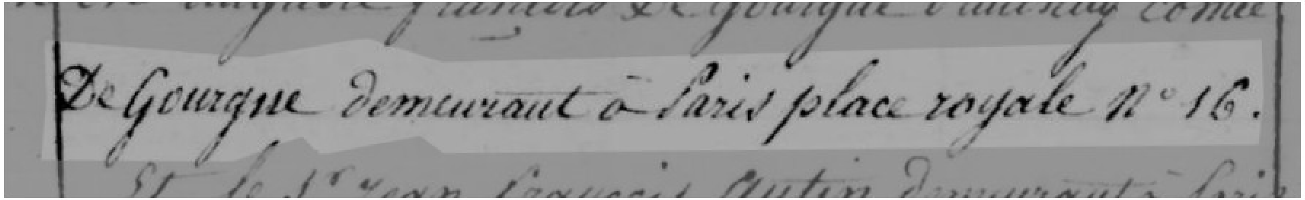
eScriptorium Home Contact My Projects My Models Hello lectaurep

Scaling for production deployment means

> collaborative logistics, infrastructures, project engineering.

> better sources diplomatic (how many handwritings in a book?)
> better mastering of digital images metadata (B/W-col. distribution) .

in order to avoid wasting AI resources.



de Gourgue demeurant à Paris place royale n°16.

by (eScriptorium) on Wed Dec 08 2021 22:22:20 GMT+0100

Thank you!

Links to doc!

- ➔ Blog: https://lectaurep.hypotheses.org/
- ➔ Gitlab: https://gitlab.inria.fr/almanach/lectaurep
- ➔ Github: https://github.com/lectaurep

Data on HTR-United

- ➔ https://github.com/HTR-United/lectaurep-mariages-et-divorces
- ➔ https://github.com/HTR-United/lectaurep-bronod
- ➔ https://github.com/HTR-United/lectaurep-repertoires

Contact

✉ alix.chague@inria.fr

✉ aurelia.rostaing@culture.gouv.fr