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# LECTAUREP: Paris Notary Record Books Automated Reading

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# LECTAUREP

## Paris Notary Record Books Automated Reading

FF21 - BnF - 10/12/2021

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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

Visionneuse

Cotes : 44 v°-51 r°

Liste chronologique des actes pour la période du 2 janvier au 14 mai 1902

Permalien

Télécharger

N <sup>os</sup> DU RÉPERTOIRE	DATES DES ACTES	NATURE ET ESPÈCE DES ACTES :		NOMS, PRÉNOMS ET DOMICILES DES PARTIES  INDICATIONS, SITUATIONS ET PRIX DES BIENS	RELATION DE l'Enregistrement.	
		EN BREVETS	EN MINUTES		DATES	DROITS
1196	28	Procuration		An 1901, mois de Décembre Portal (par Marie) à Paris, rue d'Amsterdam 24, et Marie, épouse de Abel Théophile Berger, B <sup>d</sup> Hausmann, 104, 1 <sup>er</sup> renoncer à s'opposer	30	3.75
1197	28	Dépôt de procuration		Jean teauculomnie par Charles au s'opposer à s'opposer	30	3.75
1198	28	Inventaire		Treuel (après décès de Henry Dérive), à Paris, rue Legendre 121, décide à Bnières, le 25 Août 1901	6	12.45
1199	28	Notoriété		Miziel (après le décès de Hortense Henriette Josephine, femme de Alfred Jean Marie)	6	3.75

Z

Zoom  
Luminosité  
Contraste

Verrouiller les paramètres

N° 1 / 7

Aller à

# 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

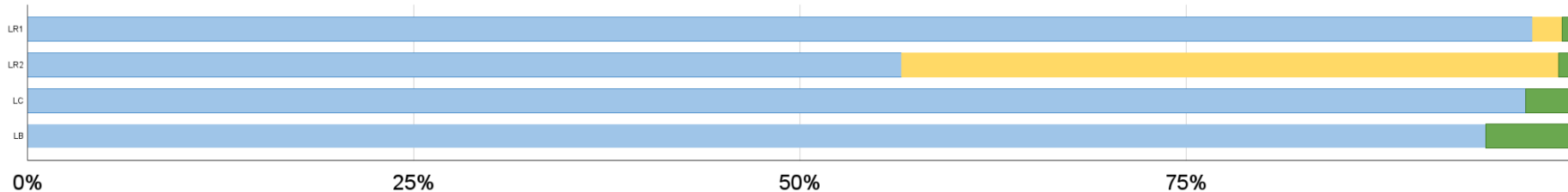
Consider **digital heritage** as a whole

- > 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

■ remaining in the lot ■ transcribed, not revised ■ transcribed and revised



# Technological environment

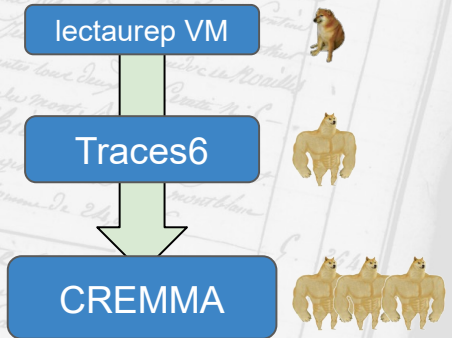
NOI	DATES	NATURE ET ESPECE	NOMS, PRENOMS ET DOMICILES DES PARTIES	RELATION
du	des	DESACTES		(Engagement)
REFOR	ACTES	EN MINUTES	INDICATIONS SUR L'OBJET ET PRO DES BENS	ACTIV
576	24	Inventaire	An 1903, mois de Juillet	29
577	24	Décharge	Cette pièce desse de Joseph à Paris, rue de la Harpe, le 14 Juin 1903	11,25
578	24	Prorogation	Donation	26
579	24	Prorogation	Mainlevée	27
580	24	Prorogation	Prorogation	28
581	25	Prorogation	Prorogation	29
582	27	Prorogation	Prorogation	30
583	27	Prorogation	Prorogation	31
584	28	Prorogation	Prorogation	32
585	29	Prorogation	Prorogation	33
586	29	Prorogation	Prorogation	34
587	30	Prorogation	Prorogation	35
588	31	Prorogation	Prorogation	36
589	31	Prorogation	Prorogation	37
590	1	Prorogation	Prorogation	38
591	1	Prorogation	Prorogation	39
592	3	Prorogation	Prorogation	40
593	3	Prorogation	Prorogation	41

## 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/](https://data.archives-nationales.culture.gouv.fr/)
  - 333 more pages ready to join HTR-United
- 1561 images of silver transcription awaiting revision

[data.culture.gouv.fr](https://data.culture.gouv.fr)

HTR  
United

Quantity of pages in gold, silver and remaining sets

■ Gold ■ Silver ■ Remaining in target





# 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)

Reference

Maison **Chevalier** à la **requête** de **Delacroix** **avocat** à Paris  
11:25  
2

**Certificat de vote**  
Le Roy (**gouverneur**) Louise **Amable** **Anais** à Paris B<sup>n</sup>d Diderot  
902  
45, p<sup>r</sup>f **reproduire** inscription de **rente** 3% de 1100<sup>r</sup>f n<sup>e</sup>

Prediction

Maison **Chevalier** à la **requête** de **Delacroix** **avocat** à Pi  
11:25  
2

**Certificat de vote**  
Le Roy (**gouverneur**) Louise **Amable** **Anais** à Paris B<sup>n</sup>d Diderot  
902  
45, p<sup>r</sup>f **reproduire** **souscription** de **rente** 3% de 1100<sup>r</sup>f n<sup>e</sup>

ignore all digits  
 ignore text case (all in lower case)  
 ignore the punctuation  
 ignore diacritical signs

Compare

	Default	Ignoring digits	Ignoring case	Ignoring punctuation	Ignoring diacritics	Combining all options
Levenshtein Distance (Char)	440	433	433	421	210	178
Levenshtein Distance (Words)	228	216	224	219	130	99
Hamming Distance	0	0	0	0	0	0
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

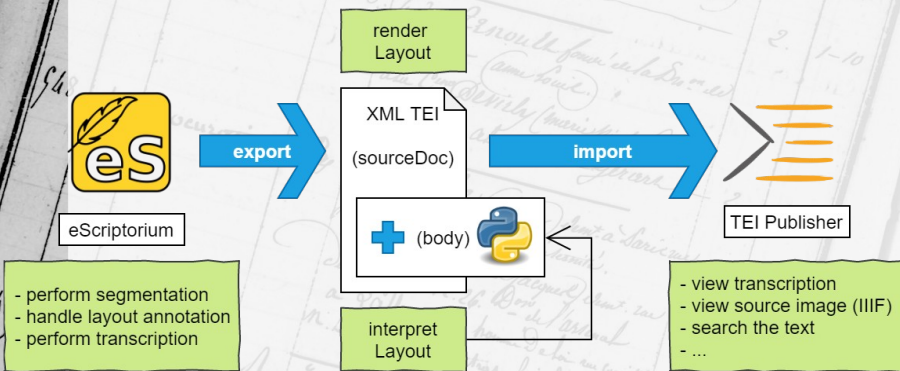
Notoriété | Leroy (après décès de Augustin Jules) demeurant à Paris, avenue de Wagram, 157, du 31<sup>e</sup> décembre 1903

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 IIF facsimile and search feature in tools like TEI Publisher



The screenshot shows the **TEI Publisher** web interface. At the top, there's a navigation bar with links for Start, Documentation, News, Download, and a search bar. Below that, a breadcrumb trail shows the document ID: **FRAN\_0025\_1290\_I-1-tei**. The main area is split into two panels. The left panel shows a table of contents:

292	15	P. V. ouv. Cof.	22	-
293	15	Inventaire	22	35

The right panel displays a facsimile of a document page titled "An 19 39 , mois de Mars" with a "4 FRANCS" stamp. The text is a list of names and dates, such as "Bajul au décès de Desiré Alexandre Martin à Banatville 7 et 9 rue des Ozarbas arrivé le 10 8<sup>bre</sup> 1938".

# 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 ‰)

## Scaling for production deployment means

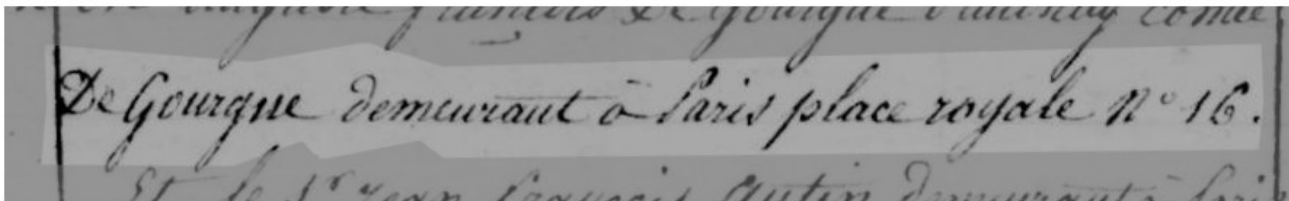
> collaborative logistics, infrastructures, project engineering.

> 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.

# 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

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