

AI at the Archives: Pilot Projects of the Estonian National Archives



REPUBLIC OF ESTONIA
NATIONAL ARCHIVES

Sven Lepa

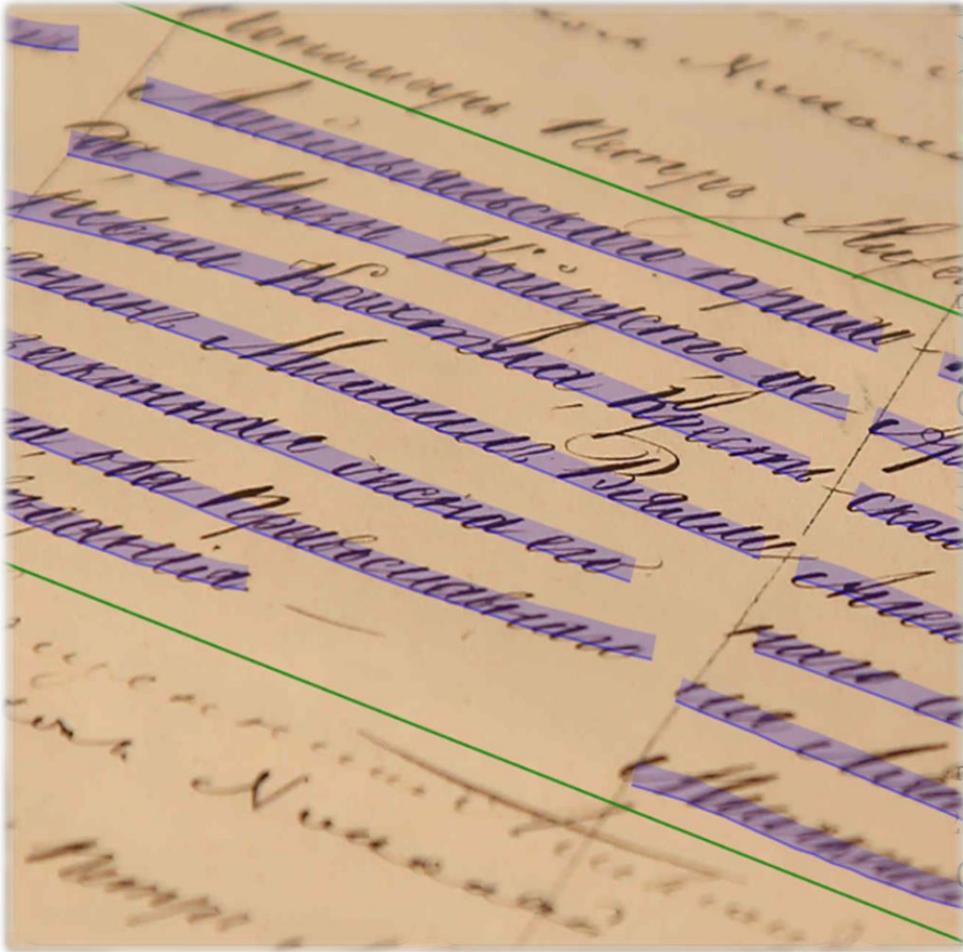
25.05.2023

National Archives of Estonia

- about 10 million **records** (the oldest from 1240)
- about 150,000 **maps** (the oldest from the first half of the 17th century)
- 9,5 million meters of **film recordings** (the oldest from 1908)
- about one million **photographs** (the oldest from the 1840s)
- 35 million **digital images** on web (ca 5% of the collections)



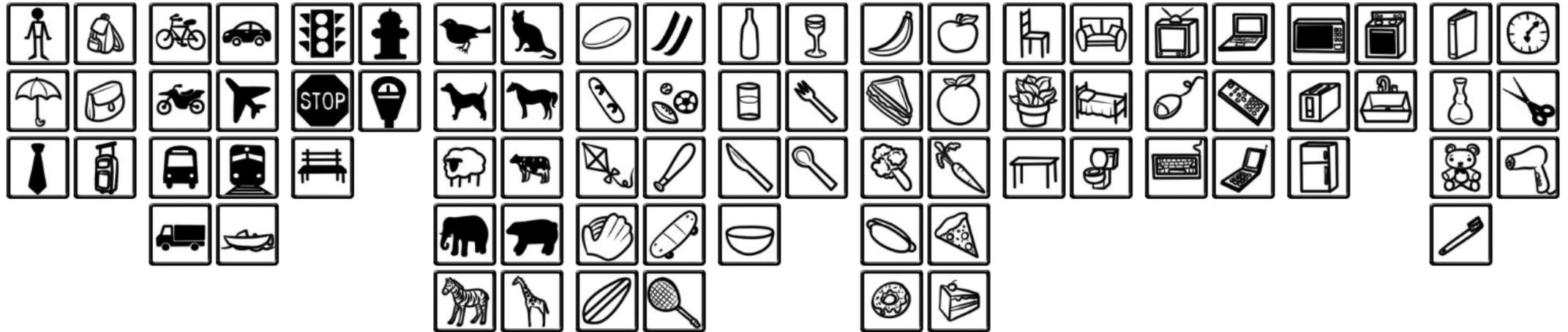
Pilot projects using **artificial intelligence**



- **Object recognition**
- **Facial recognition**
- **Handwritten text recognition**

Object recognition

Object recognition

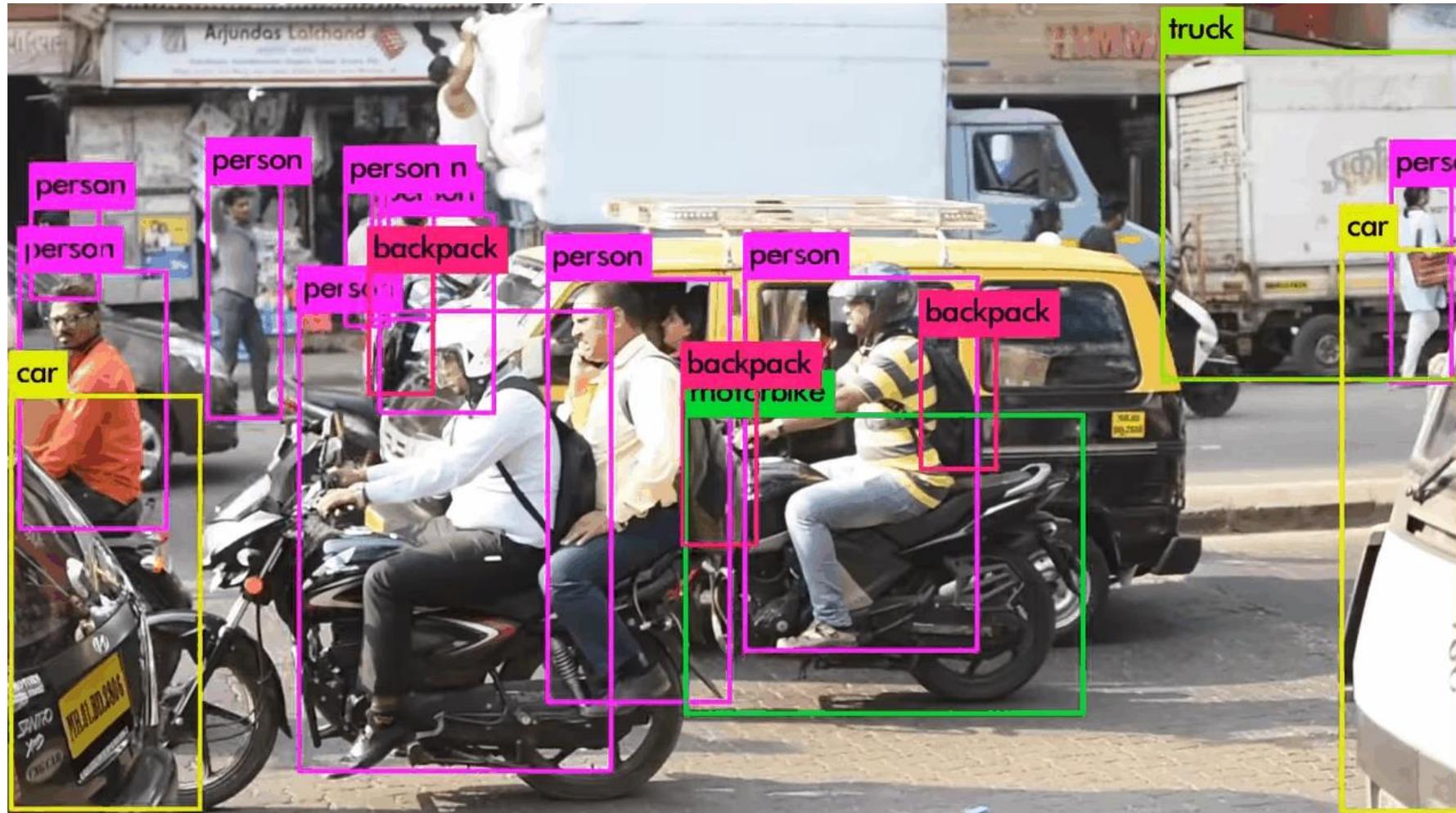


Object recognition: training data (COCO)



<https://cocodataset.org/#explore?id=137188>

Object recognition: real-time results (YOLO)



<https://www.youtube.com/watch?v=MPU2HistivI>

Object recognition: results

Advanced Search

Simple Search

Search Clear

All Digitised Not Digitised

Reference Code Code Fond Inventory Archival Page nr Foto Nr Short form

For ranges search use wildcard 1-9999 (separated by spaces), or in the form of > 6 and <70 * or 10 *, or *p

Location Not Set

Fond Title

Type Album Photo

Title

Computer-detected objects

- * Cat
- horse
- Hot dog
- Keyboard
- Kite
- Knife
- Laptop
- Microwave
- Motorcycle
- Mouse
- Orange

Location Select form hierarchy

Place detail

Period

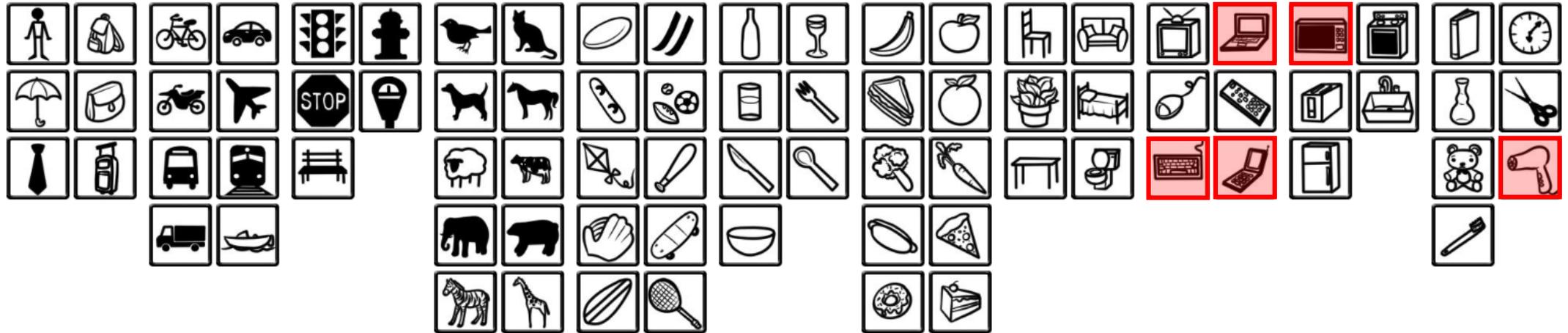
Author

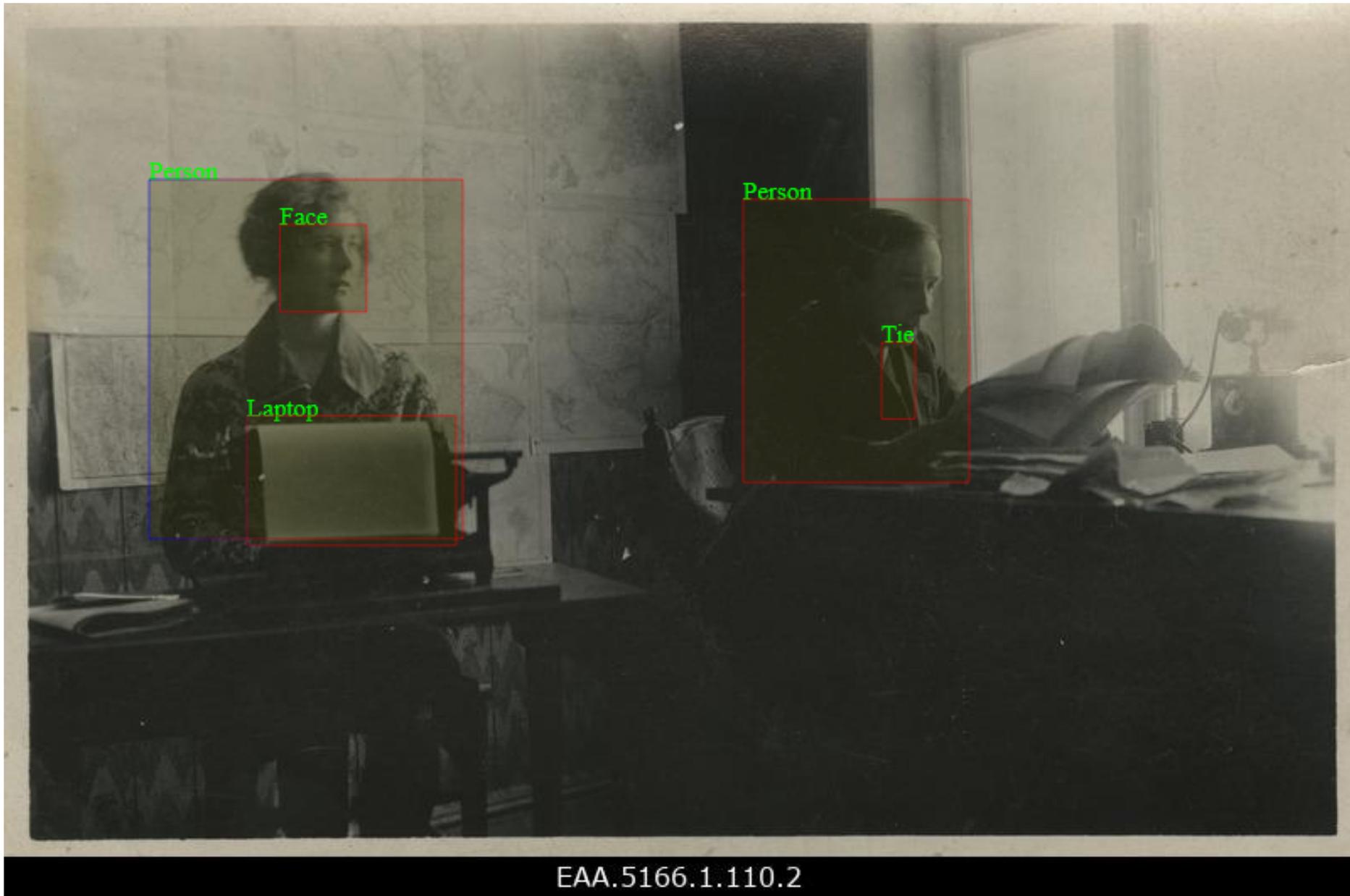
Studio

Public Remarks

<https://www.ra.ee/fotis/>

Object recognition: contemporary





Johannes Audova working in the ETA, 1923-24



EAA.1858.1.345.109

A consultant with a model of a horses hoof and horseshoe at an agricultural exhibition

Object recognition: US-centric





EAA.5266.1.1269.98

Salme Kask by the Valgejõe river, 1970

Author: Benita Labi



EFA.546.0.298624

At the Eduard Vilde kolkhoz, 1988-1990

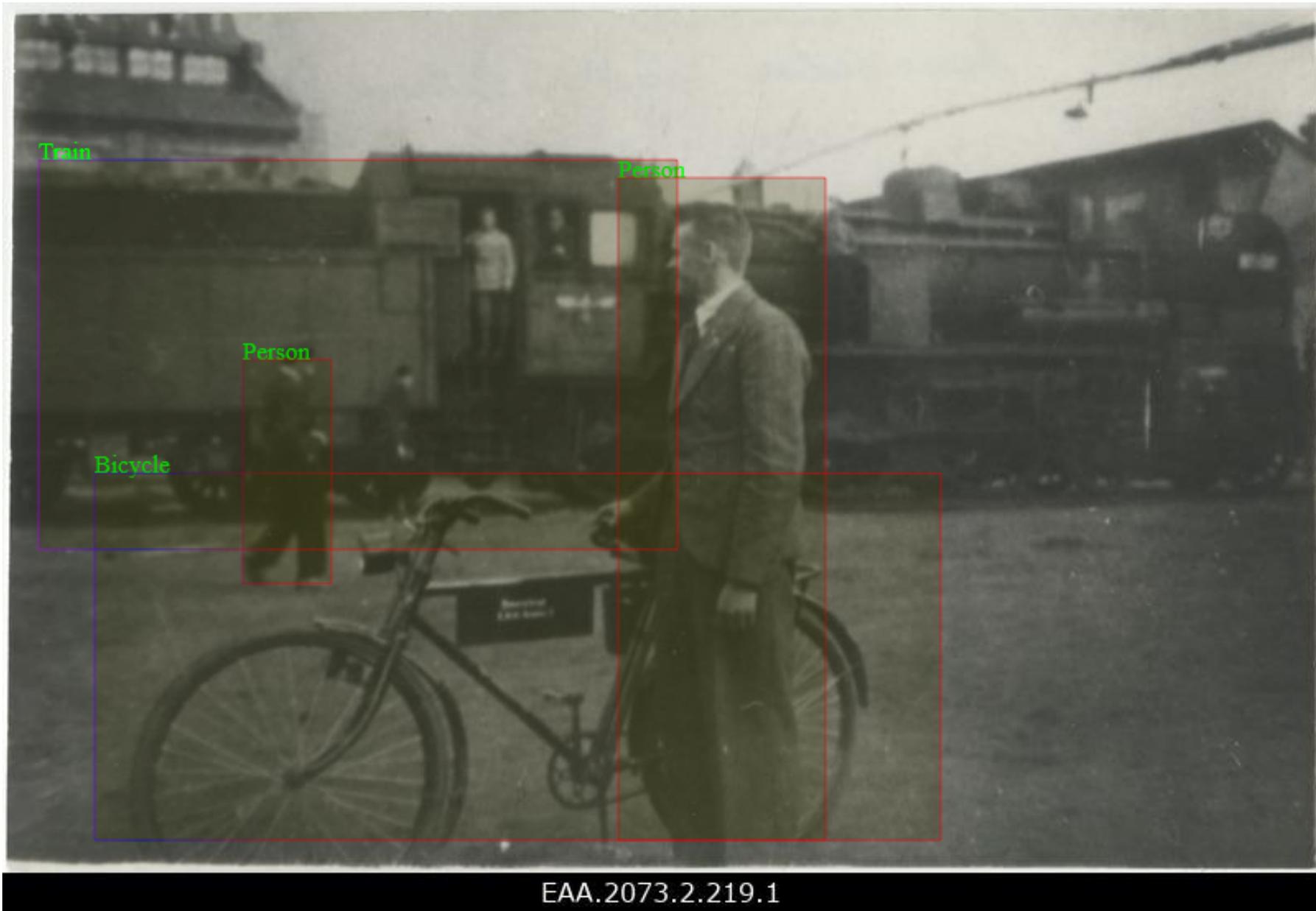
Author: Harald Leppikson

Object recognition: not just for fun



The poet Aleksander Müller, 2002

Author: Ove Maidla



EAA.2073.2.219.1

Steam locomotive on the Tartu-Petseri railroad, 1936

Facial recognition

Facial recognition: finding faces



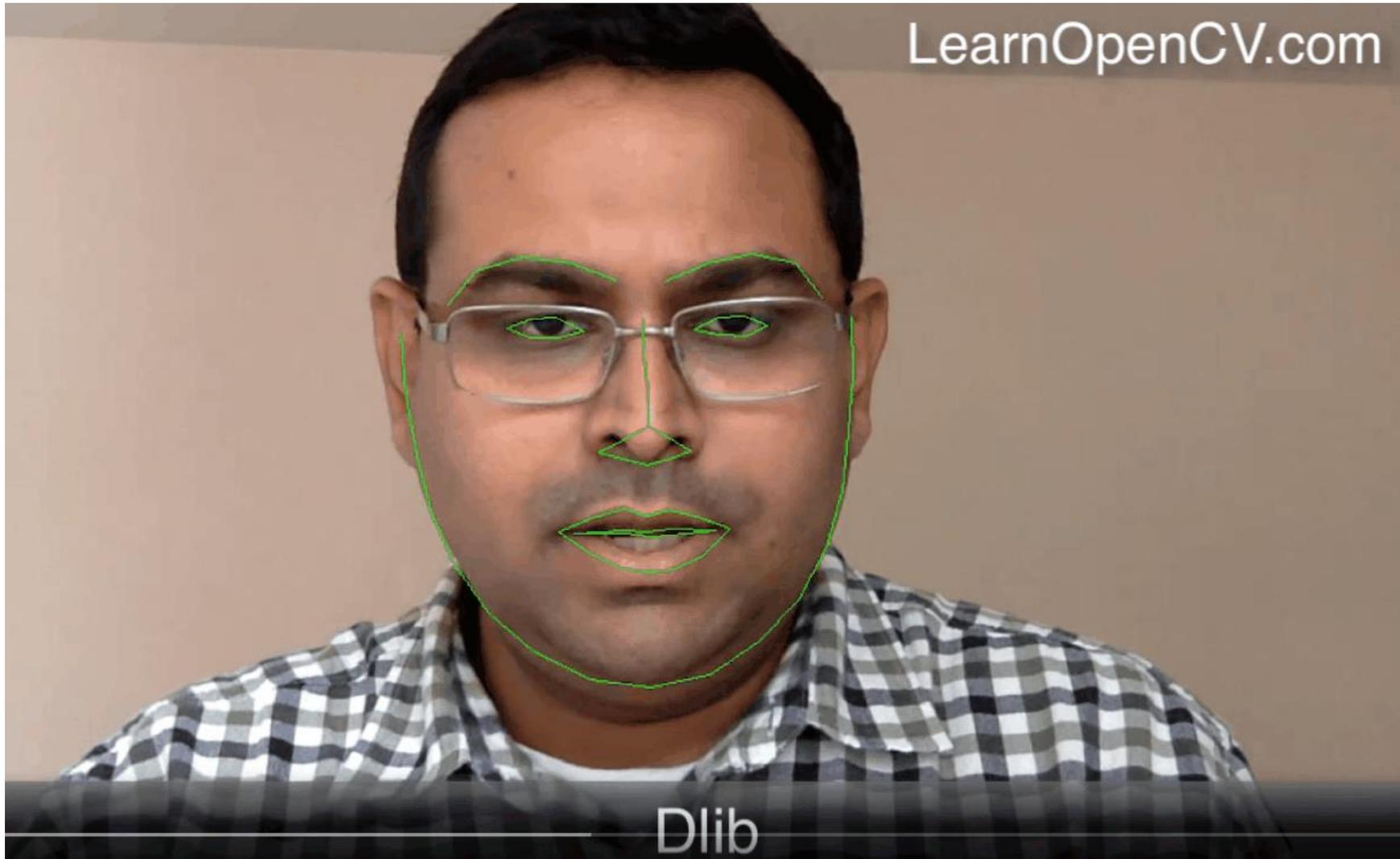
Members of the old and new government, 1927

Facial recognition: finding faces?



Demonstration at the Tallinn Town Hall Square, 1987

Facial recognition: finding landmarks



https://www.youtube.com/watch?v=j49RbZf_SgY

Ilme: find Your ancestors!

Ilme

HOME FAQ QUERY FEEDBACK 

The National Archives invites you to look up your ancestors on FOTIS photos. Face recognition is run on the photos you upload and they are compared with over half a million photos dating back as far as the 1840s. By the following day you'll be emailed the best matches from among approximately 3 million faces.

START SEARCH

<https://www.ra.ee/ilme>

Ilme: find Your ancestors!



Ilme

HOME

FAQ

QUERY

FEEDBACK



 Upload photo

 Take photo of face



Email

Security code



SEND

Example: Aleksander Tõnisson



ERM Fk 2625:5

Faces found in the image.



1



Leidandmed

EFA.272.0.167353

AVA FOTISES

2



Leidandmed

EAA.2111.1.12426.7

AVA FOTISES

3



Leidandmed

ERA.1622.1.964.40

AVA FOTISES

4



Leidandmed

EFA.114.A.255.1046

AVA FOTISES

Example: Aleksander Tõnisson



ERM Fk 2625:5

Faces found in the image.



5



Leidandmed

EFA.204.0.48494

AVA FOTISES

6

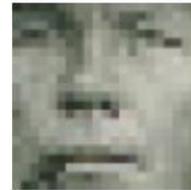


Leidandmed

EAA.2111.1.12426.9

AVA FOTISES

7



Leidandmed

ERAF.2.2.5090.1

AVA FOTISES

8



Leidandmed

ERA.1583.1.273.7

AVA FOTISES

Example: Aleksander Tõnisson



ERM Fk 2625:5

Faces found in the image.



65



Leidandmed

EFA.114.0.50437

AVA FOTISES

66



Leidandmed

EAA.2111.1.13330.29

AVA FOTISES

67



Leidandmed

EFA.10.3.5185

AVA FOTISES

68



Leidandmed

EFA.257.A.288.59

AVA FOTISES

Example: my grandfather

Faces found in the image.



1



Leidandmed

EAA.5303.1.310.78

AVA FOTISES

2



Leidandmed

EFA.761.0.386150

AVA FOTISES

3

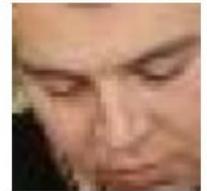


Leidandmed

EFA.204.0.4922

AVA FOTISES

4



Leidandmed

EFA.565.10.24308

AVA FOTISES

Example: my grandfather

Faces found in the image.



5



Leidandmed

EFA.204.0.2831

AVA FOTISES

6



Leidandmed

EFA.761.0.392965

AVA FOTISES

7



Leidandmed

EFA.546.0.311974

AVA FOTISES

8



Leidandmed

EFA.289.0.64102

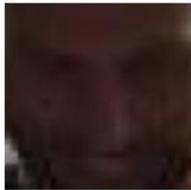
AVA FOTISES

Example: my grandfather

Faces found in the image.



77



Leidandmed
EFA.209.0.148884

AVA FOTISES

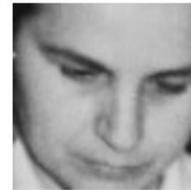
78



Leidandmed
EFA.204.0.10863

AVA FOTISES

79



Leidandmed
EFA.345.0.75981

AVA FOTISES

80



Leidandmed
EFA.114.A.455.95

AVA FOTISES

Pixel Acuity: better is possible!

Clustering Faces



Doug Peterson

Pixel Acuity: better is possible!

Interesting Findings



Estonia History Museum



Estonia History Museum



Handwritten text recognition

Kallid o
 Tahtsin iga päev kirja
 Peal korralik olema,
 kasitatud saada. K
 kasarmu arestis, Märk
 kui teine. Kuwa meil
 moodustati, siis waadu
 reihma peale ja peab



AIS

About AIS

Help

Search Help

New Search



File: ERA.1278.1.267 K. Pätsi kirjad omastele ja tuttavatele

Open

Open Archive Structure

Data

Subunits

General data

Unit Level	File	
Reference	ERA.1278.1.267	
Title	K. Pätsi kirjad omastele ja tuttavatele	
Dates	22.05.1904-15.04.1938	
Extent and medium	Type	Amount
	Lehtede arv	53
Reading Room	Tallinna uurimissaal	



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113

Members

27

Countries



Ehron seinen Kon, sondern wie wir gefallt
Lepore, was der H. Land / Götting, der oben
wir der der in Befragung.

Dass selbiger H. Benet aber, die execution auf
sic, freyheit, ist Beygablich, zu machen ist ja sic,
wie Land Kundig, nicht nur so sehr, und die
so Göttinger Gewinnbringung, der Göttinger Tonnale
in Friedland, so von Michel Engelhard vertritt,
aller ist, so noch übrig, weil er aber auch die
intra den selbigen Götting, in solingen Levestreit,
wie auch der H. Land / Götting Brief zu ver-
sehen, dass der Hof sic attest bringe, ob selbiger

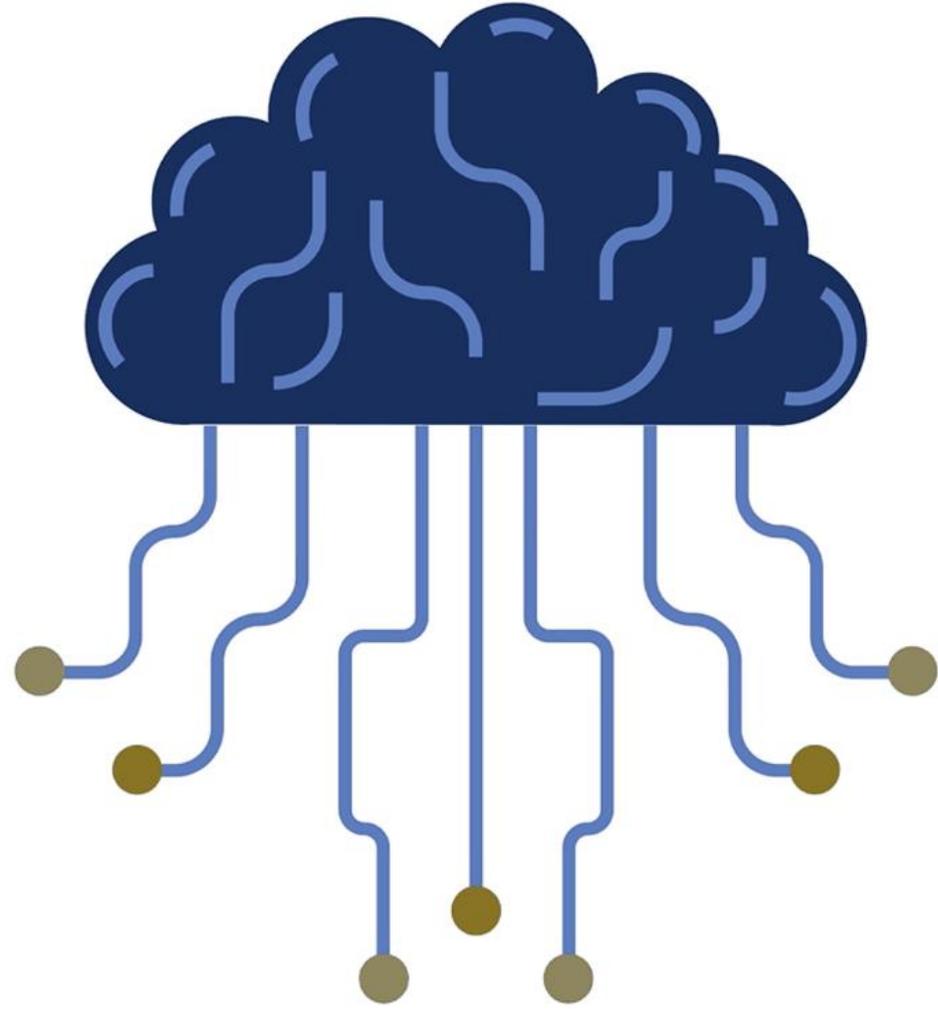
Eynen seinen Kon, sondern wir nicht gefall
te sein, was der H. Landtsperrung, der orten
wider das in besagt.

Das selbigen H. Benet aber, die execution auf
sic, frey ist, ist Bergablig, zu verfahren ist, ja sic,
wie Landt Rindig, nicht nur so sehr, und die
so Göttrich gemin oberrung, der gütlich Tonula
in freyland, so von Michel Engelhard vertritt,
aller ist, so noch übrig, wilken aber auch die
intra den selbigen gütlich, in solangn legestriert
wie auch der H. Landtsperrung vertritt zu ver
fahren, bis zu dem sic attest bringe, ob selbigen

Ehron suchen kan, sondern mir muß gefallen
lassen, was der H. Landshöfding, der orten,
weiter darin verhenget.
Daß selbiger H. Benet aber, die execution auch
hir, sruchet, ist vergeblich, zumahlen Ich ja hir,
wie land kundig, nichtß mehr habe, und die
10 jährige genießbrauchung, des guhtß Tönnula
in Finland, so von Michel Engelhard erkaufft
alles ist, so noch übrig, weilan aber auch die
intraden selbiges Ruhtß, in solange sequestrirt,
wie auß deß H. Landshöfdingß brieff zu er-
sehen bieß Ich von hir attest beybringe, ob selbiger
Engelhard solvendo. Alß bitte nochmahlen,
wie schon, in meiner vorigen supplique
gestriges tages gebehen, umb Schein u. attest,
daß Ich zwar die execution, wegen refusion
meines Kauffschillingß für Tönnula, nemlich
die 2700 rdhr. spec. beym Königl. Gowernam. ge-
suchet, aber wegen des Engelhards großer unver-
mögenheit nichtß erhalten können, son-
dern eß dabey müßen bewenden laßen,
muß mir also billig, laut Ihr. Königl. Maytt.
in solchen fällen, ergangene u. verfaßeten

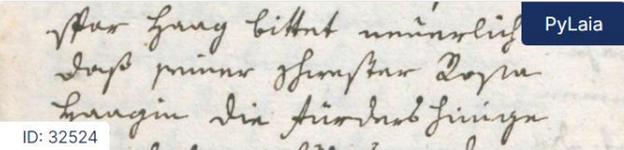
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muß mir also billig, laut Ihr. Königl. Maytt.
in solchen fällen, ergangene u. verfaßeten



Transkribus: public models

Featured Models



PyLaia

ID: 32524

TRANSKRIBUS GERMAN KURRENT M2 - HANDWRITTEN

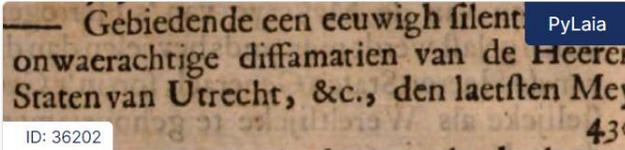
Transkribus German Kurrent

By: Transkribus Team

🇩🇪 German 📄 German Kurrent, Sütterlin, Fraktur

% 5.29 (CER)

[VIEW & TRY MODEL](#)



PyLaia

ID: 36202

TRANSKRIBUS PRINT 0.3 - PRINT, TYPEWRITTEN

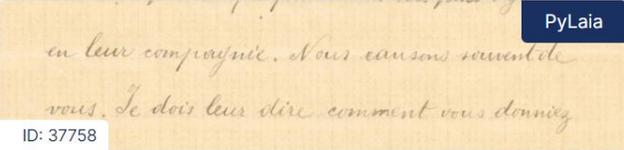
Transkribus Print Multi-Language

By: Transkribus Community

🇩🇪 Dutch, English, Finnish, French, German, Swedish

📄 Latin alphabet, Fraktur % 1.6 (CER)

[VIEW & TRY MODEL](#)



PyLaia

ID: 37758

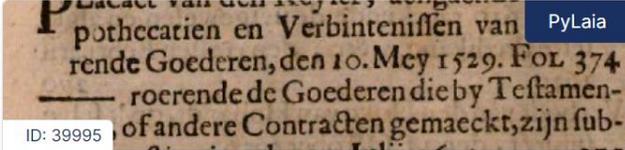
TRANSKRIBUS FRENCH MODEL 1 - HANDWRITTEN

French – General Model

By: Transkribus Team

🇫🇷 French 📄 Latin alphabet % 7.8 (CER)

[VIEW & TRY MODEL](#)



PyLaia

ID: 39995

TRANSKRIBUS PRINT M1 - PRINT, TYPEWRITTEN

Transkribus Print Multi-Language

By: Transkribus Team

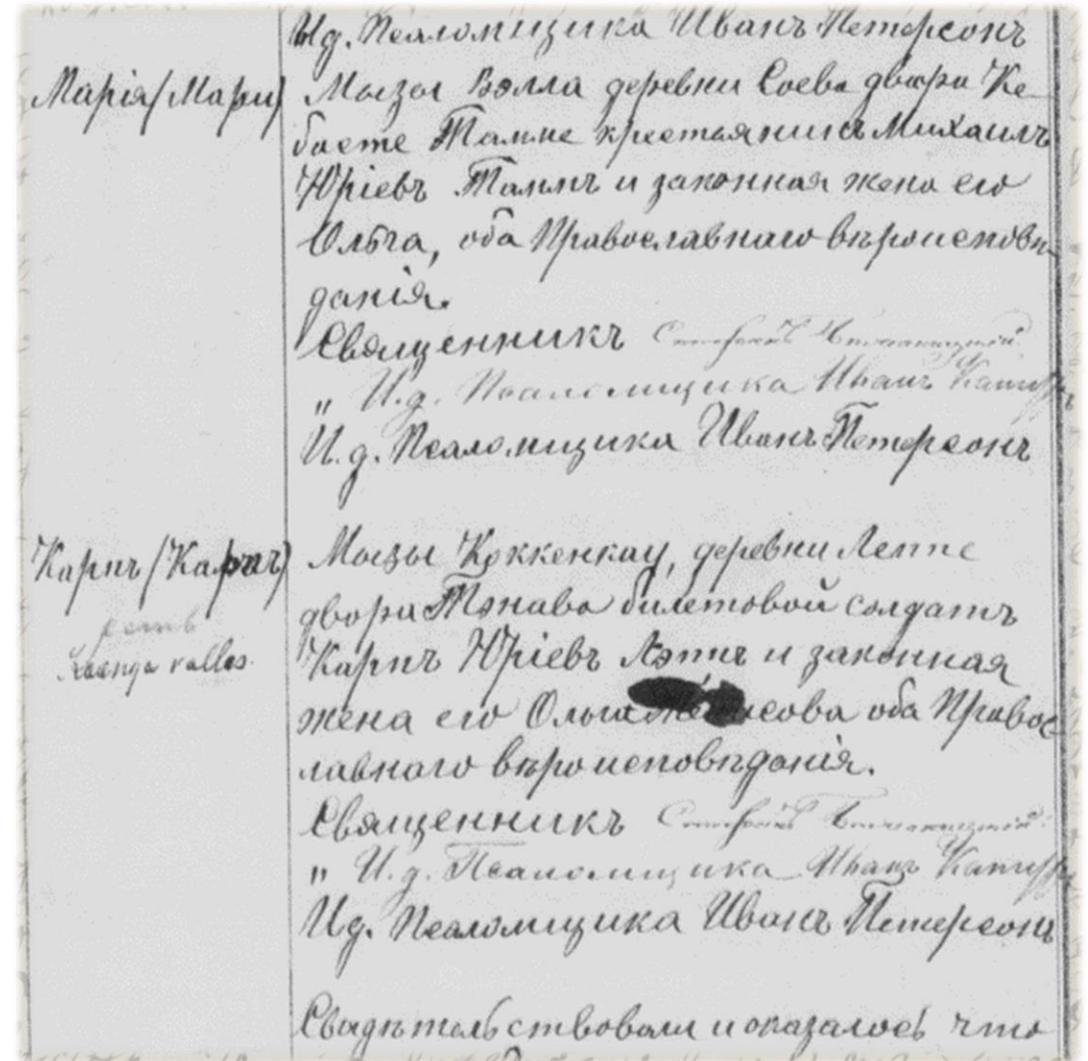
Dutch, English, Finnish, French, German, Italian, Latin, Swedish,
🇮🇵 Portuguese, Spanish, Polish, Flemish, Czech, Slovak, Slovenian,
Castilian

📄 Latin alphabet, Fraktur % 2.20 (CER)

[VIEW & TRY MODEL](#)

HTR projects

- Minutes of the Tartu city council (1902-1940)
- Petitions to the Governor General of Estonia under Swedish rule (17th c.)
- Russian orthodox birth registers (1838-1938)



J.O.Rütti, A.Kullam, O.Laurits, J.Tallo, V.Koppel, M.Massakas, J.Alver, O. Al-
lik, J.Aavik, A.Braats, P.Ingermann, E.zur-Mühlen, V.Bulgarin, V.Hartmann,
G.Post, J.Lill, K.Pahk, J.Sepp ja V.Tamman.

Seega on antud hääli Linnavalitsuse ettepaneku poolt 26 ja vastu 19.

Linnavolikogu, arvesse võttes hääletamise tagajärgi, mille järele Linnava-
litsuse ettepanek, mis seotud laenu tegemisega, ei ole saanud Linnasead.§ 71
põhjal nõutavat kahe kolmandiku koosolekul viibijate volinikkude häälteenamust,
on

otsustanud:

Linnavalitsuse ettepanek oksjonil 18.okt.s.a. müüdü J.Haubneri pärijate
Jaama, Raekoja ja Puiestee uul.nurgal asuva kinnisvara, kinn.nr.135/136 ostu-
eesõiguse tarvitamise ja selle kinnisvara omandamiseks kr.22.200 suuruse lae-
nu tegemise kohta tagasi lükata.

XI.

Veevärgi ehitamise aruanne ja veevärgi ehitamiseks tehtud laenu piken- damise ning kustutamise küsimus.

Aruandja: linnapea K.Luik.

Linnavolikogu 21.mai 1928 a. otsuse põhjal asus Linnavalitsus veevärgi
ehitamisele 11.juulil 1929 a.

Veevärgi ehitamise ja selleks tarvitatud summade kohta esitab Linnava-
litsus Volikogule järgmise aruande:

Ehitatud on veevärgi pea- ja harumagistraale:

200 mm. magistraale jooksvat meetrit	- 2407,
175 mm. " " " "	- 20,
150 mm. " " " "	- 472,

J.O.Rütti, A. Kullam, O.Laurits, J.Tallo, V.Koppel, M.Massakas, J.Alwer, O. Al-
lik, J.Aavik, A. Braats, P.Ingermann, E.gur-Mühlen, V. Bulgarin, V. Hartmann,
ik

G. Post, J.Lill, K.Pahk, J.Sepp ja V.Tamman.

Seega on antud hääli Linnawalitsuse ettepaneku poolt 26 ja vastu 19.

Linnavolikogu, arvesse võttes hääletamise tagajärgi, mille järele Linnawa-
litsuse ettepanek, mis seotud laenu tegemisega, ei ole saanud Linnasead.§ 71
põhjal nõutavat kahe kolmandiku koosolekul viibijate volinikkude häälteenamust
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Linnawalitsuse ettepanek oksjonil 18.okt.s.a. müüdü J.Raubneri pärijate
Jaama, Raekoja ja Puiestee uul.nurgal asuva kinnisvara, kinn.nr.135/136 ostu-
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nu tegemise kohta tagasi lükata.

XI.

Veevärgi ehitamise aruanne ja veevärgi ehitamiseks tehtud laenu piken-
küsimum.

damise ning kustutamise

Aruandja: linnapea K.Luik.

Linnavolikogu 21.mai 1928 a. otsuse põhjal asus Linnawalitsus veevärgi
ehitamisele 11.juulil 1929 a.

5op

Veevärgi ehitamise ja selleks tarvitatud sammwade kohta esitab Linnawa-
litsus Wolikogule järgmise aruande:

Ehitatud on veevärgi pea- ja harumagistraale:

nud

-2407,

200 mm. magistraale jooksvat meetrit

rul.V

6

20

175 mm.

Stockholm Ao. 1685 - Den 7. Augusti -

journey ... Stockholm

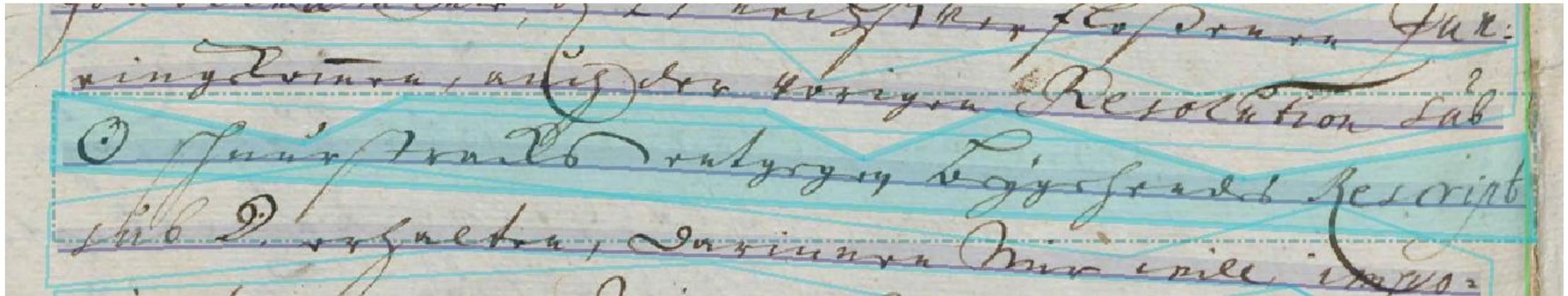
in Stockholm befild' allsina ...

in Stockholm ...

ben sub dato Nova Solun d. 29 Julij 1689.

Nova Solun

Comparison of “old” and “new” model



HTR:

⊙ schmnrstrücks|entgegen begygehendes Rescripb

HTR+:

⊙ schuurstracks entgegen beygehendes Rescripto

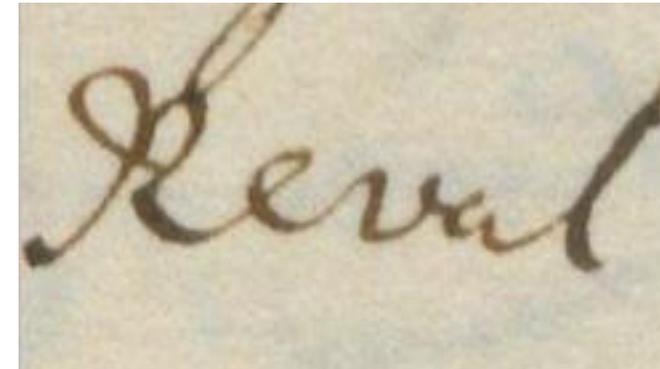
CORRECT:

⊙ schnurstracks entgegen beygehendes Rescript

Keyword Spotting

"Reval" (40 hits)

Confidence ^	Page Nr.	Line transcription	Previ...
0.7325	64	Reval Sles den 1t Mocy A. 1618 r	
0.6660	76	ergebend. Reval Schl. Hn. d 7b. H. 1 688.	
0.6219	53	in Real d5 ten ously Ao 1687	
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0.5102	57	versiegelt. geschehe n Revae Sen- sepmt	
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0.4404	62	wlln. Gö e. baht iipfaslen Real	
0.4272	96	H. Reval	
0.4153	30	Revoll Schloß d. 22 Sub. 1688.	
0.3986	15	klglaß stelle Gettl. Rerall Schloß dn 16 Fbr. r688	
0.2703	41	Tanater zekrffthenen, Daknn eval	
0.2518	68	diesehesanst i Kevall	
0.2428	98	Reuol sgmechen mögen olß orsicheee ich rein H Srauder u	
0.1967	68	etrihen, aten auff Schl PvnI.	
0.1886	39	olle Rvold..6Ocetatr B o7p	
0.1863	100	pecual d. 2 Fb. ao 16Sin	
0.1606	97	Egraoch üngn kenner Rogh Reialschemie Lolff	
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0.1274	54	Crosocollo evi Caiais sCprers Revatenu	
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0.0933	9	dentieernr. Datam xe pvoull d. 10 Senmtr	
0.0904	73	tariren. Boerl. p. Remt Schiß, den . May	
0.0877	91	Kena. Metntt Lil Redulimng wer ket hatdaßtet i tlaat	
0.0854	93	lachverzußerngen, wgelcher gestalt der Hr. Ritt M. Srck	
0.0811	93	bedi Herrl möchs, dochrirelhnhrefntsn H. Ridhall. ven	
0.0715	28	D. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30.	



Remt

-	+	↓	↘	↻
1.	Мария	<p>Юрьевского уезда, Ейзельской волости, крестьянская девица</p> <p>Юлия Михелева Рейвальдь, лютеранского вероисповедания, присоединена чрез Св. Таинство Миропомазания к Православной Восточной Каоликеской Церкви, с наречением имени Мария.</p> <p>Священник Дмитрий Александрович Семенов</p>		
10	Евдокия	<p>Феллинского уезда, Лустиферской волости, крестьянская девица</p> <p>Евдокия Юрьевна Семенова православного вероисповедания и законная жена его Елена Семенова лютеранского вероисповедания.</p> <p>Священник Дмитрий Александрович Семенов</p>		

Мария

Евдокия

Елена

Юрьевского уезда, Ейзельской

волости, крестьянская девица

Юлия Михелева Рейвальдь,

лютеранского вероисповедания.

присоединена чрез Св. Таинство

Миропомазания к Православной

Восточной Кафолической церкви,

с наречением имени Мария.

Реплинского уезда, Лустиферской

волости крестьянин Егорь Иваовъ Юрь-

енсонъ православного вероисповедания и

законная жена его Елена Тенисова,

лютеранского вероисповедания.

Феллинского уезда, Лустиферской

волости крестьянин Дионисий

Адовъ Рейссонъ православного

вероисповедания и законная

жена его Анна Юриева - лютеран-

ского вероисповедания.

Счетъ роди- вшихъ.		Мѣсяцъ и день		Имена родившихъ.	Званіе, имя, Отчество и фамилія родителей, и какѡвъ въкронповѣданіи.	Званіе, имя, Отчество и фамилія воспріемниковъ.	Кто совершалъ крѣщеніе.	Ръкопр- телей
Мужска пола.	Женска пола.	рожда- ніи.	креще- ніи.					

		Мартъ.		Павла	Волости Синаемъ, деревни мая, крестьянинъ Яковъ Густавовъ <u>Коча</u> , правосла- наго вѣроисповѣданія и законная жена его Лиза Магусова, материнскаго исповѣданія.	Волости С. Мартенсъ, деревни Озникъ, крестьянинъ Василій Васеновъ Каргола- и Волости Синаемъ, крестья- нская дѣвица Елена Владимі- рова Вестерт.	Св.вещеніи Георгій Коздревскій сына- и мещинномъ Иваномъ Ивановъ Вурскъ и И. д. п. с. м. м. м. м. м. Константиномъ Лешинъ.		
		4	25	19.		Поздрантъ.			
						Иванъ Вурскъ.			
						Лешинъ			

		4		7	19.	Павелъ	Волости Синаемъ, деревни мая, крестьянинъ Зоянтъ Евстаевъ <u>Сундвуртъ</u> пра- вославнаго вѣроисповѣданія и законная жена его Юлиа Анова, материнскаго испо- вѣданія.	Волости Синаемъ, крестья- нинъ Евстаевъ Юрсеви Кедонскій и мѡво-во Волости крестьянская дѣвица Анна Анова Каргола-сь.	Св.вещеніи Георгій Коздревскій сына- и мещинномъ Иваномъ Иван- овъ Вурскъ.		

Märsmå Pärmi linna perekonnaseis-
 ametniku otuse järele 10. detsembrist
 1936. aastal on Paul Suits' bõrgi mehe
 perekonnanimi "Suits".
 Märsmå Pärmi l. perekonnaseis-
 ametniku otuse järele 10. det. 1936. on Paul
 Suits' bõrgi (Suitsu) mehe nimeks "Paul".

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№	Ж	№	Имя	Содержание	Примечание
1.	6.	2.	Александр	Возврату Мещинца арестованного Петром Павлом Сааром и законная жена его Мария Ивановна; оба права евангелично впрошенывданис.	В ерт бо же на ме
				Священник Михаил Стахович	
				Исаакиевича Николаи Савина	
				Михайловича Яковлева Давиде	
1.	18	2.	Арина	Возврату Варшавца крестьянина Мартина Савина	В ерт По

Structure

" 13. II.	Август Горейш	<p>Кирсановъ Александръ мисль Гурко Крестовникъ Германъ Вилманъ Законникъ жена его Елизавета въ силу объ Православномъ Келовданіи Врш, ені совершиетъ. Свщ, еникъ Александръ Гурскій Причтникъ Викторъ Ситовъ. Директоръ Мисіонар. Мисіонар.</p>	Мисль Никола Яко М.
1. " 1. Сент, вер.	Август Мисіонар.	<p>Кирсановъ Александръ мисль Авдеева Крестовникъ Гурманъ Мисіонар Сиксонъ 29 лѣтъ присужденъ къ лѣтн, ені въ Православію грешъ ст. Мисіонарскій въ карачаевскій мисль Мисіонарскій совершиетъ. Свщ, еникъ Александръ Гурскій.</p>	

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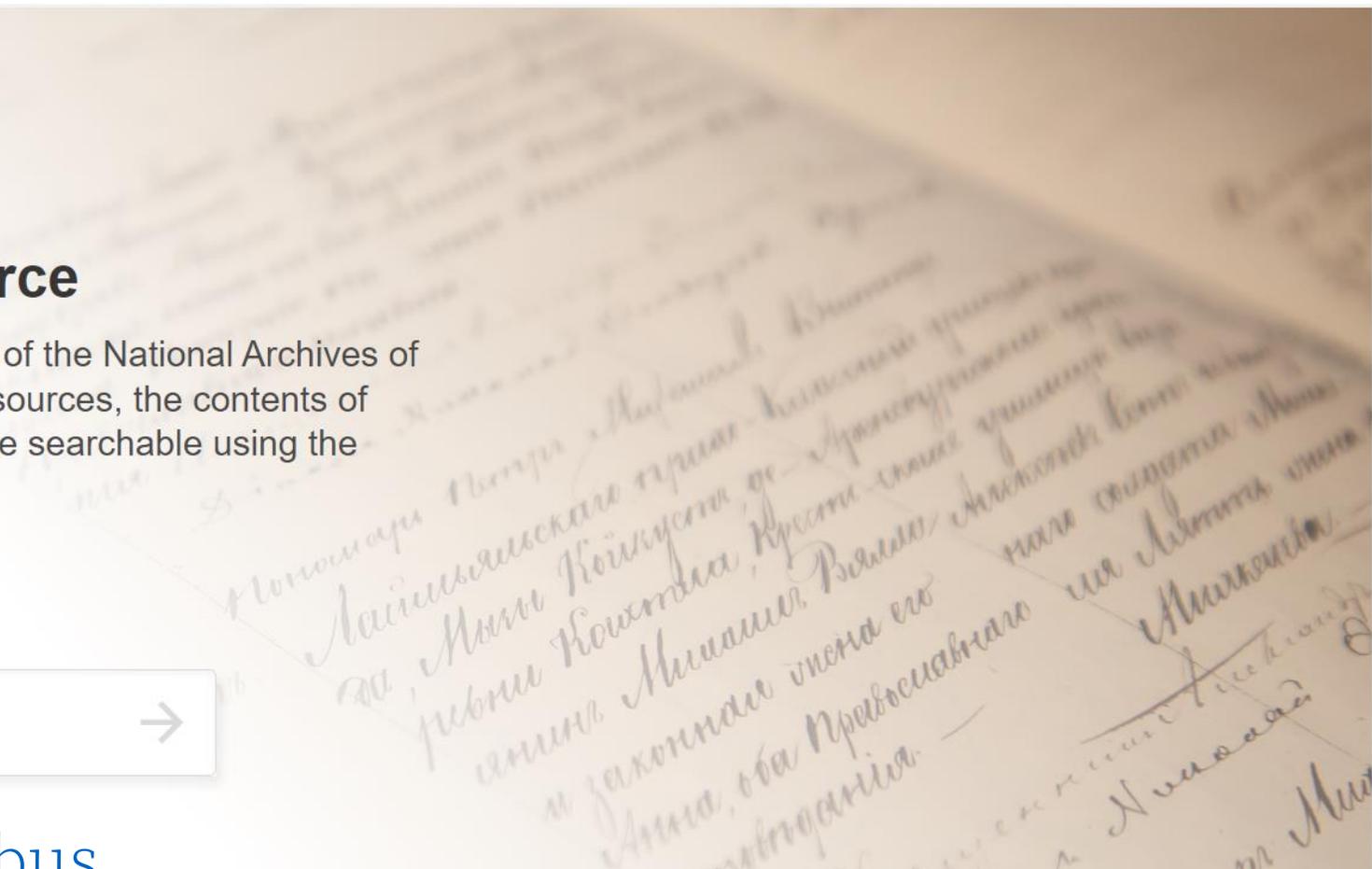
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