

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



REPUBLIC OF ESTONIA
NATIONAL ARCHIVES

Sven Lepa

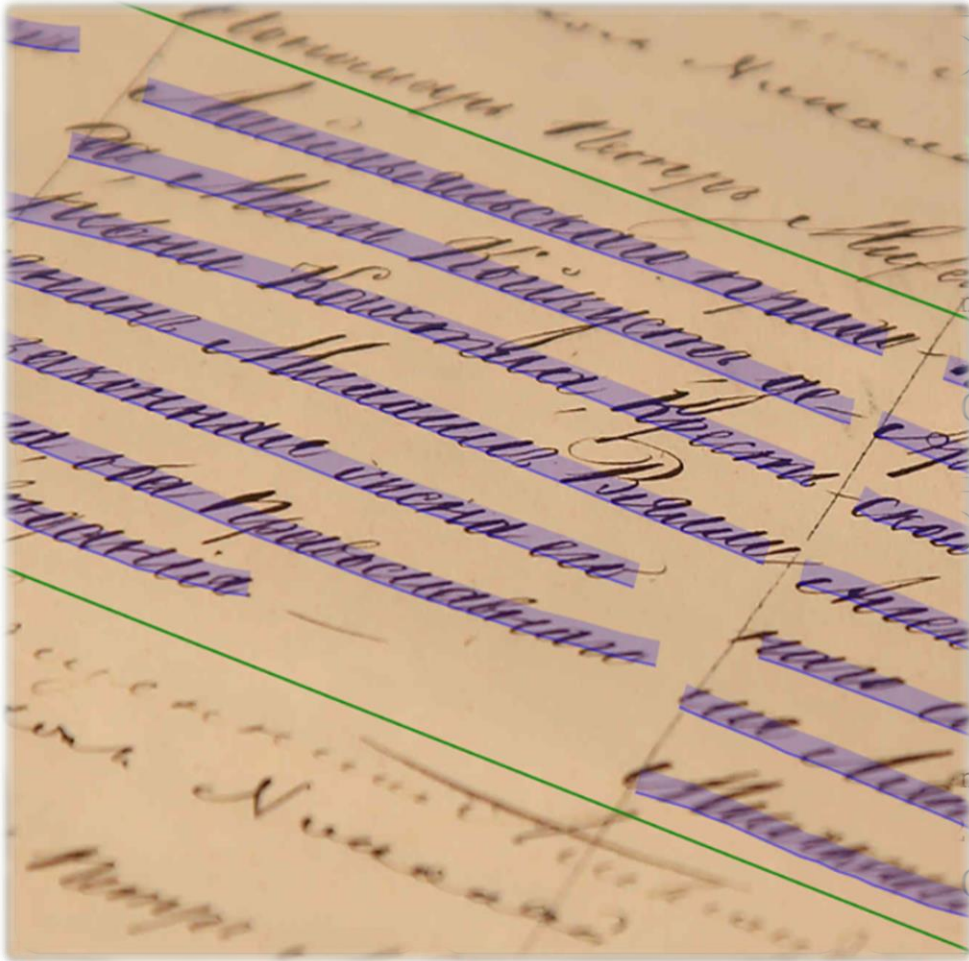
25.05.2023

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)



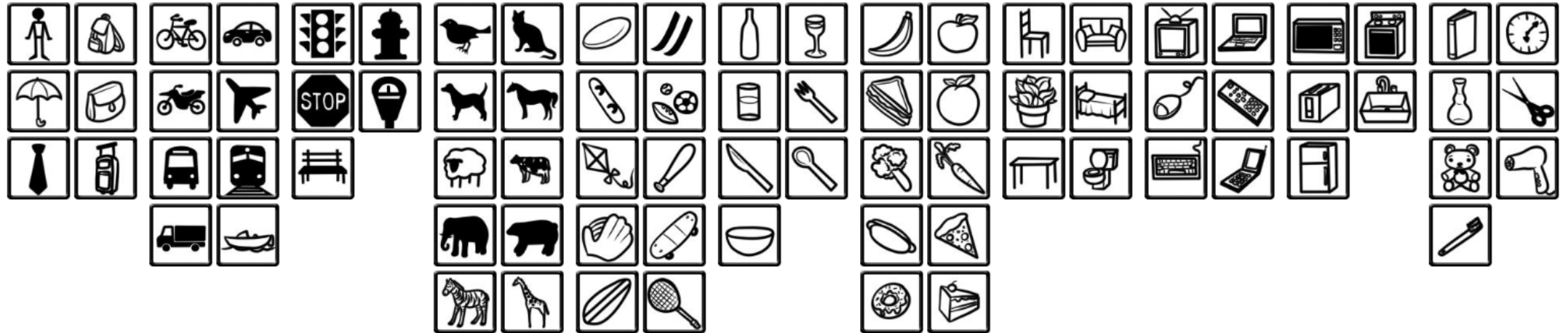
Pilot projects using **artificial intelligence**



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

Object recognition

Object recognition

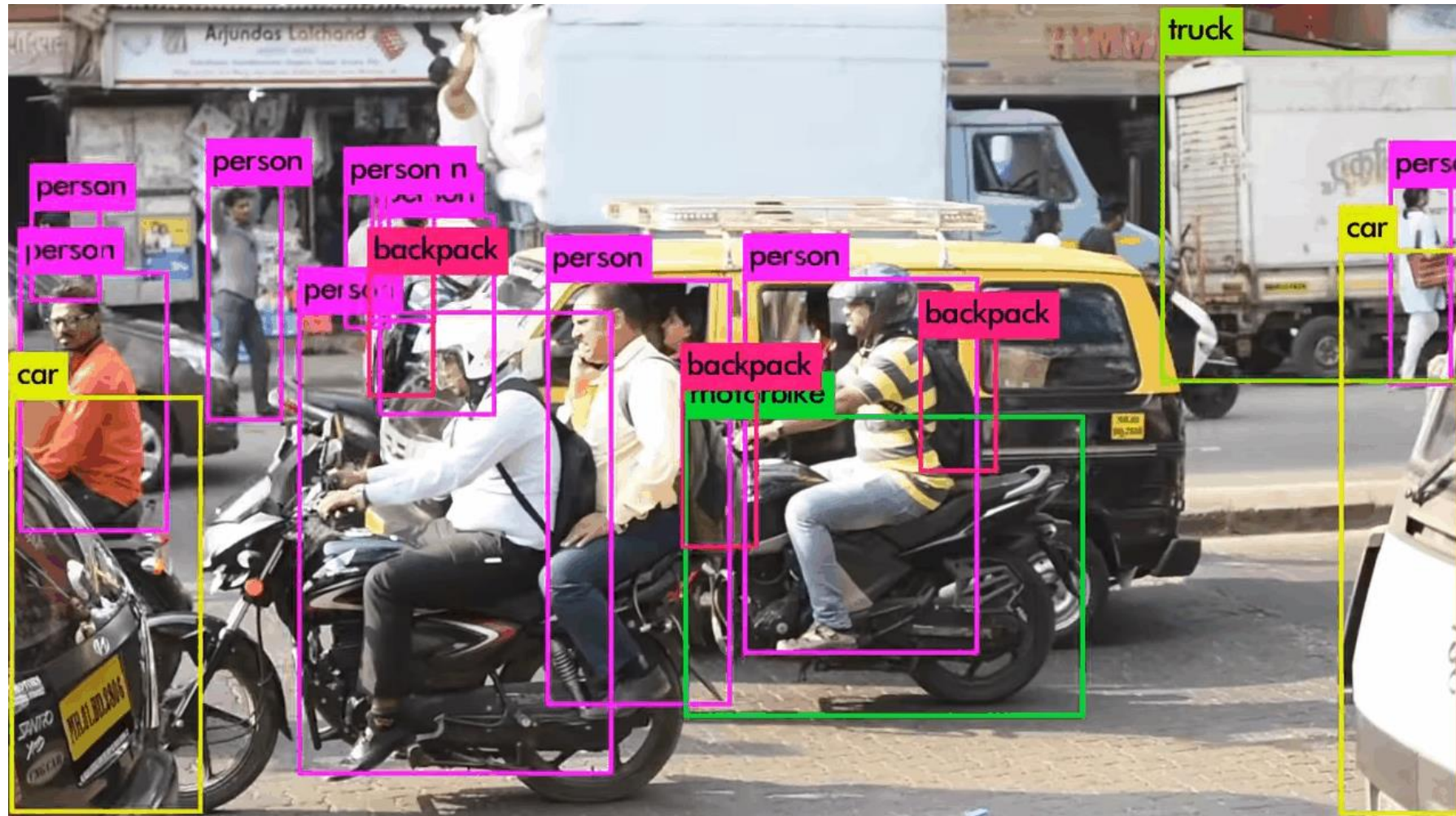


Object recognition: training data (COCO)



<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

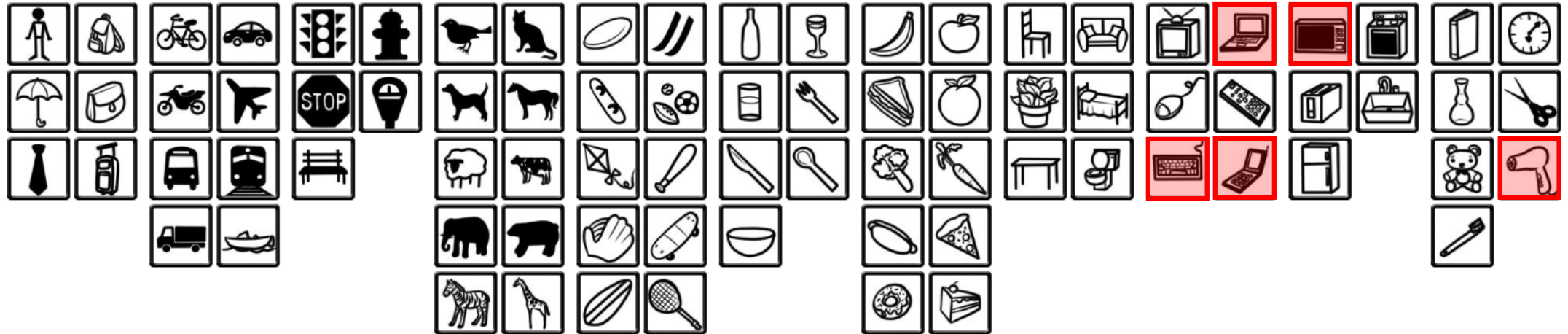
Author

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



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

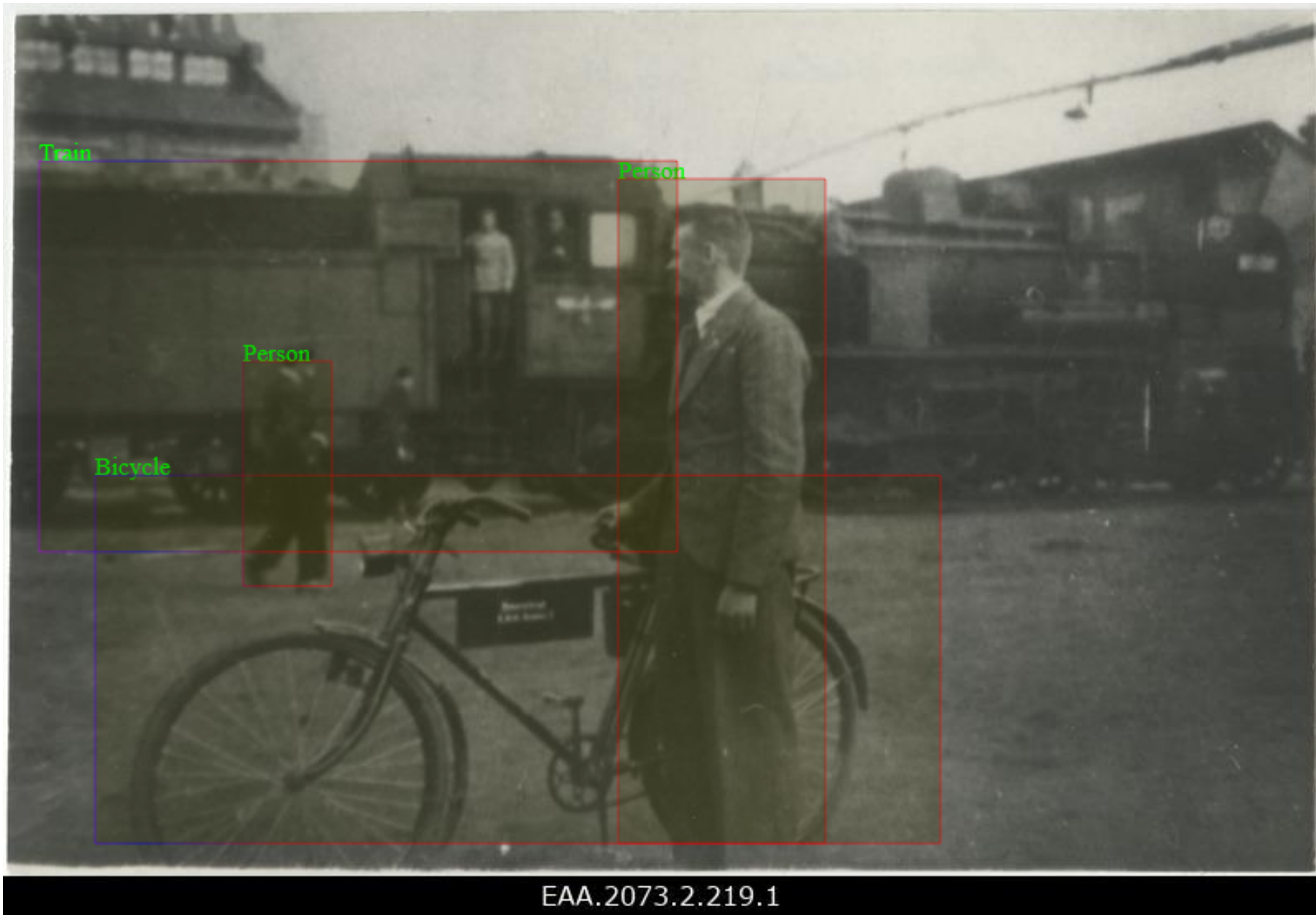
Author: Harald Leppikson

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

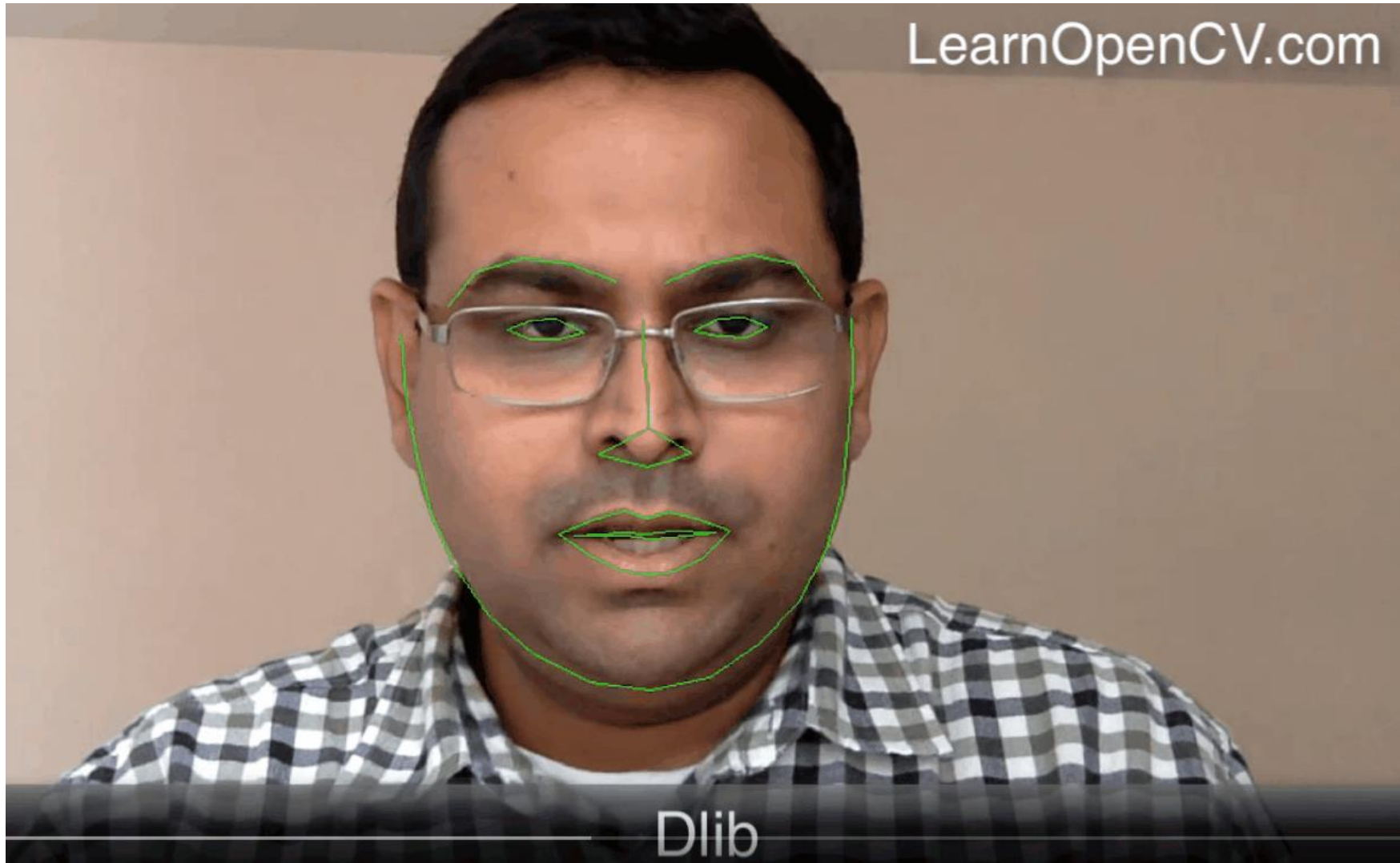
Facial recognition: finding faces?



ERA.4967.1.P_0093.1.1

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

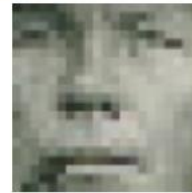


Leidandmed

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

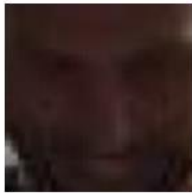
AVA FOTISES

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



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,
 kasistatud laada. 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	



Transkribus[®]

Members of READ-COOP SCE

Many hands make light work.

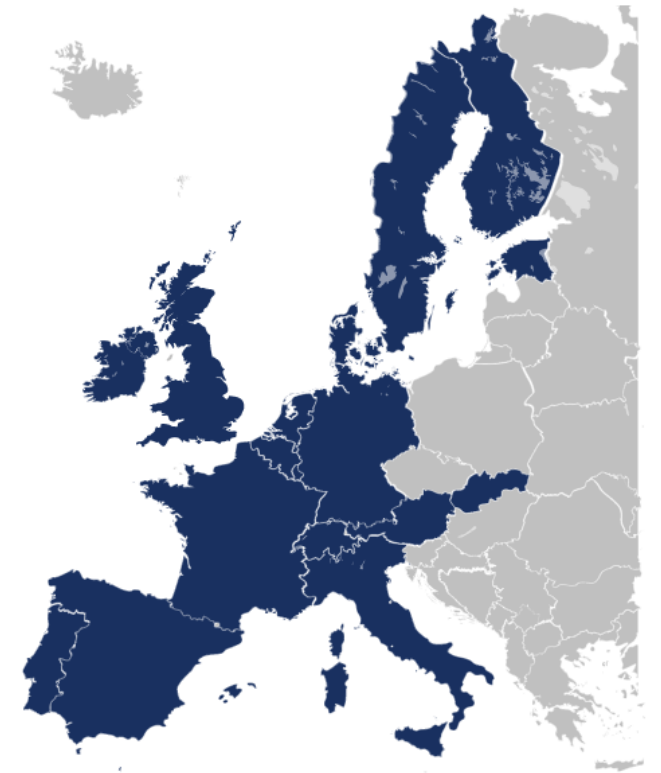
More than 100 institutions and private persons have already joined the coop. Every single member is an important pillar for the success of Transkribus and the further development of Transkribus. [Become a member now >](#)

113

Members

27

Countries



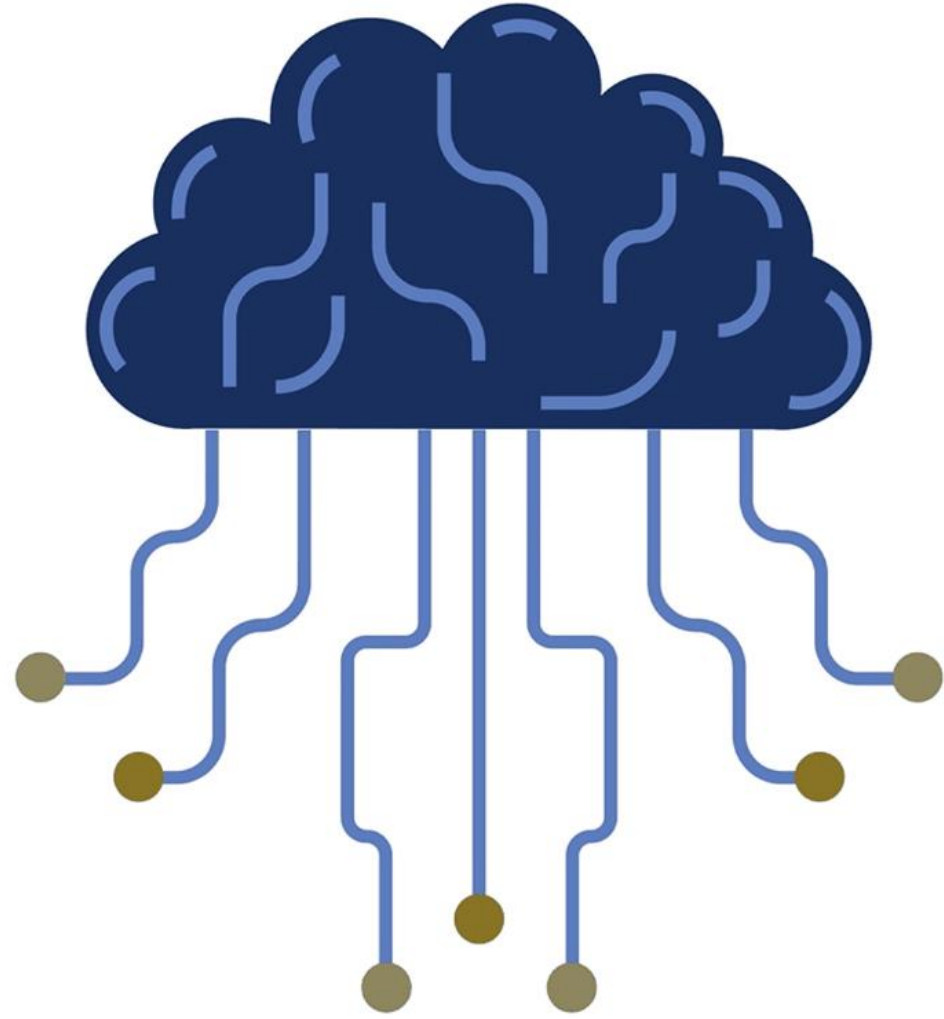
Ehron seinen Kon, sondern wie wir gefallt
Lassen, was der H. Land Pföndling, der unten
weiter unten in Beaufangt.

Dass selbiger H. Benet aber, die execution auf
sic, freyheit, ist Beygablich, zu machen ist ja sic,
wie Land Rindig, nicht nur so sehr, und die
so Göttrig zu sein obauskunft, der Gisth Tonula
in freiland, so von Michel Engelhard vertritt,
aller ist, so noch übrig, weil er aber auch die
intra den selbigen Gisth, in solang levestrit,
wie auf der H. Land Pföndling befrist zu sein
sagen, dass der Hof sic attest bringe, ob selbiger

E. Gnade seinen Kon, sondern eine 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, weilen 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. bey dem Königl. Gowernam. ge-
 suchet, aber wegen des Engelhards großer unver-
 mügenheit nichtß erhalten können, son-
 dern eß dabey müßen bewenden laßen,
 muß mir also billig, laut Ihr. Königl. Maytt.
 in solchen fällen, ergangene u. verfaßeten

Thron suchen kan, sonden 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,
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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

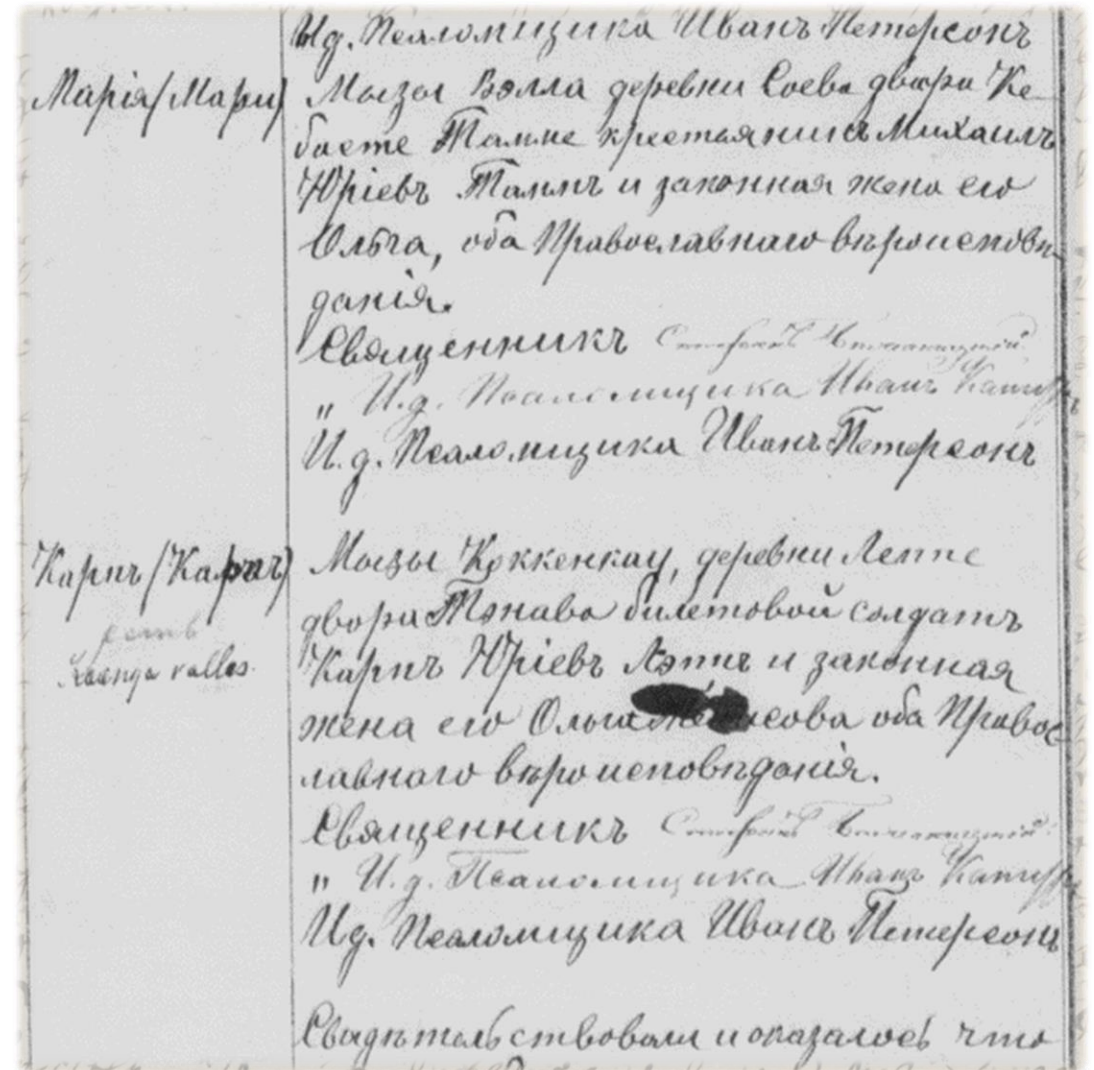
Dutch, English, Finnish, French, German, Italian, Latin, Swedish,
🇬🇧 Portuguese, Spanish, Polish, Flemish, Czech, Slovak, Slovenian,
Castilian

📄 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
ifood effes no sel

ädatet-

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otsustanud:

Linnawalitsuse ettepanek oksjonil 18.okt.s.a. müüdü J.Raubneri pärijate
Jaama, Raekoja ja Puiestee uul.nurgal asuva kinniswara, kinn.nr.135/136 ostu-
eesõiguse tarvitamise ja selle kinniswara omandamiseks kr. 22.200 suuruse lae-
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 jookswat meetrit

rul.V

6

20

175 mm.

Stockholm Ao. 1685 - Den 7. Augusti -

journey ... Stockholm

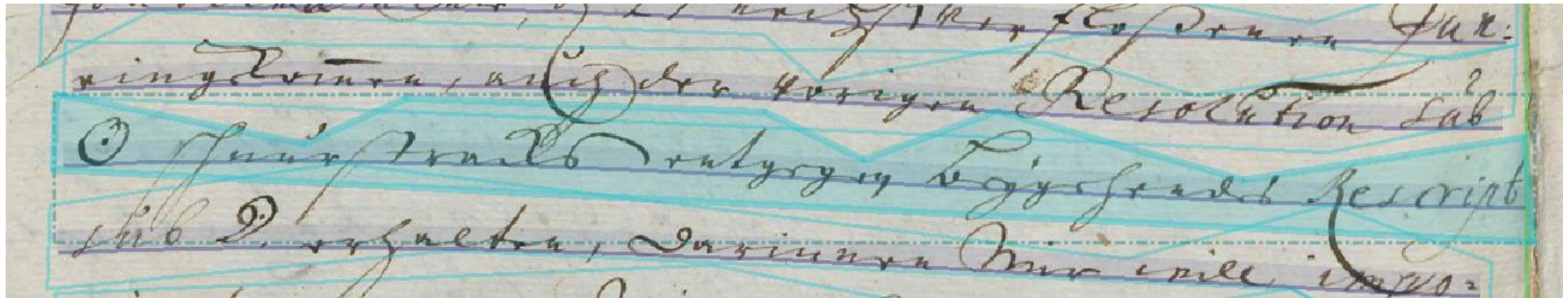
in Stockholm befild' allsina ...

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

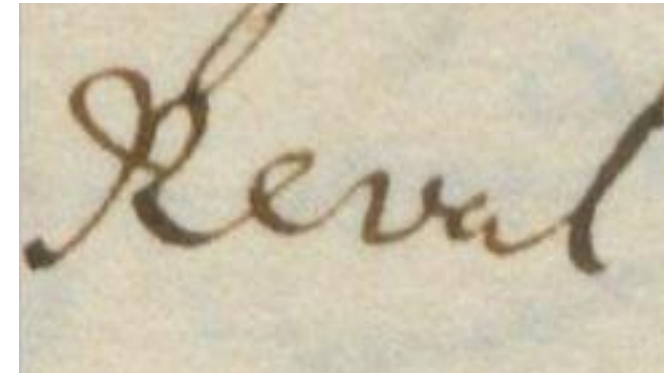
CORRECT:

⊙ 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 ouly Ao 1687	
0.5599	96	Real, sempt asdent iuhl	
0.5102	57	versiegelt. geschehe n Revae Sen- sepmt	
0.4738	69	tonipm, nuten dat Rceval d. 4. tar. Ül ist mi nabst inliegener	
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	
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0.2518	68	diesehesanst i Kevall	
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0.0877	91	Kena. Metntt Lil Redulimng wer ket hatdaßtet i tlaat	
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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

	<p>1. Мария</p>	<p>Юрьевского уезда, Ейзельской волости, крестьянская девица Юлиа Михелева Рейивальдь, лютеранского вероисповедания, присоединена чрез Св. Таинство Миропомазания къ Православной Восточной Каоликеской Церкви, съ наречением имени Мария.</p> <p>Священник Димитрий Масломинский Сеодоръ</p>
<p>10. Еедокинь</p>	<p>Феллинского уезда, Лустиферской волости крестьянинъ Егоръ Иваовъ Юрьенсонъ православно вероисповедания и законная жена его Елена Тенисова лютеранского вероисповедания.</p> <p>Священник Димитрий</p>	

Мария

Еедокинь

Елена

Юрьевского уезда, Ейзельской

волости, крестьянская девица

Юлиа Михелева Рейивальдь,

лютеранского вероисповедания.

присоединена чезъ Св. Таинство

Миропомазания къ Православной

Восточной Кафолической церкви,

съ наречениемъ имени Мария.

Реплинского уезда, Лустиферской

волости крестьянинъ Егоръ Иваовъ Юрь-

енсонъ православнаго вероисповедания и

законная жена его Елена Тенисова,

лютеранского вероисповедания.

Феллинского уезда, Лустиферной

волости крестьянинъ Дионисий

Адовъ Рейссонъ православнаго

вероисповедания и законная

жена его Анна Юриева - лютеран-

скаго вероисповедания.

Счетъ родившихся.		Мѣсяцъ и день		Имена родившихся.	Званіе, имя, Отчество и фамилія родителей, и какѳвъ въ крѳтосповѣданіи.	Званіе, имя, Отчество и фамилія воспріемниковъ.	Кто совершалъ крѳщеніе.	Рѳкопрѣтели
Мужскаго пола.	Женскаго пола.	рождающагося.	пріемника.					

	Мартъ.			Павла	Волости Синаемъ, деревни моя, крестьянинъ Яковъ Густавовъ <u>Коча</u> , православно- наго вѣроисповѣданія и законная жена его Лиза Магусова, материнскаго исповѣданія.	Волости С. Мартеискъ, деревни Озникъ, крестьянинъ Василій Васеновъ Карголаецъ и волости Синаемъ, крестья- нская двѣща Елена Владимі- ровна Вестертъ.	Св.вѣстникъ Георгій Коздринскій сына- помощника Улана И. И. у. п. священника Константиномъ Лешинъ.		
	4	25	1926						

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	4	7	1936	Павелъ	Волости Синаемъ, деревни моя, крестьянинъ Зоянтъ Евстаевъ <u>Сундбергъ</u> пра- вославнаго вѣроисповѣданія и законная жена его Юлиа Анова, материнскаго испо- вѣданія.	Волости Синаемъ, крестья- нинъ Евстаевъ Юрсевъ Коздринскій и мать-его волости крестьянская двѣща Анна Анова Карголаецъ.	Св.вѣстникъ Георгій Коздринскій сына- помощника Улана И. И. у. п. священника Константиномъ Лешинъ.		
	4								

Мартинъ Пярми линия perekonnaseis-
ametniku otuse järele 10. detsembrist
1936 aastal on Paul Suits' borigi шекс
perekonnanimena "Suitsu".
Мартинъ Пярми l. perekonnaseis-
ametniku otuse järele 10. det. 1936a. on Paul
Suits' borigi (Suitsu) шекс nimena "Paul".

Св.вѣстникъ Георгій
Коздринскій - Уланъ

Коздринскій
Маммъ Вуртъ.

Structure

№	Ж	№	Имя	Содержание	Другие
1.	6.	2.	Александр	Возврату Мещинца арестованного Петром Павловым Сааром и законная жена его Мария Ивановна; оба правомерно впрошено в суд.	В ст бо же на ме
				Священник Михаил Стахов	
				Исаакиевский Николай Васильевич	
				Мещинца Яковлев Давид	
1.	18	2.	Арина	Возврату Варшавского крестьянина Мартиня Васильевича законная жена его	В ст По

Structure

" 13. II.	Август Горейш	<p>Кирсановъ Александръ Ивановичъ Кирсановъ Александръ Ивановичъ Законникъ жена его Елизавета сидя въ Православномъ Келовданіи Крестъ совершилъ. Свещенникъ Александръ Горский Причестникъ Викторъ Ситковъ. Дьяконъ Викторъ Мещеряковъ.</p>	Мозы Никола Яко М.
1. " 1. Сентябрь.	Август Моканіа	<p>Кирсановъ Александръ Ивановичъ Кирсановъ Александръ Ивановичъ Сиксонъ 29 летъ приговорена къ смерти въ Православію грехъ ст. Мирошаванъ въ карачаевъ яшан. Мирошаванъ совершилъ. Свещенникъ Александръ Горский.</p>	

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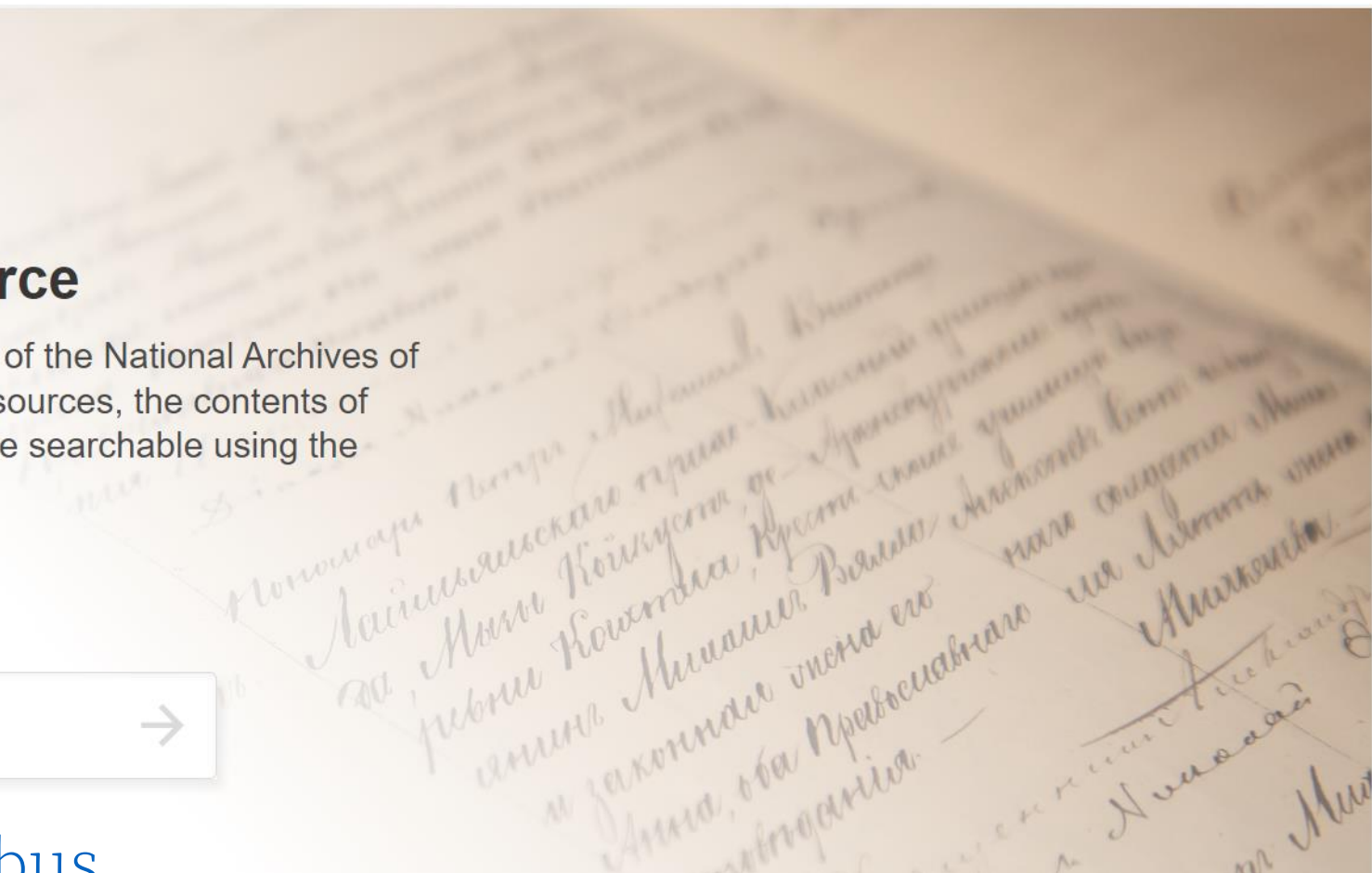
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