

Artificial Intelligence at EURid

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Why AI at EURid?

- Artificial Intelligence (AI) or Machine Learning (ML) tools are powerful and were “easily” available:
 - Also for a SME and a small team
 - Open source libraries
 - Constant improvement and easier availability
 - Increasing ease of use and capabilities

How did EURid start?

- We started small and cooperating with University
 - APEWS (2014)
- We gain expertise whilst tools become easier to use and more powerful “as we speak”
 - In-house development: WebClass (2018), NameGen (2022), ...

EURid's AI/ML/GPT* related projects

- **APEWS** → abuse detection at pre-delegation
- **WebClass** → automatic web page classification
- **NameGen-GPT** → alternative domain name generation

* AI = Artificial Intelligence ML = Machine Learning GPT = Generative Pretrained Transformers

APEWS

- Abuse Prevention and Early Warning System
- Trained on professional cybersec data sources
- Detects alleged abusive registrations at pre-delegation
- Domains are registred but not immediately delegated
- Registrant is invited to validate its identity
- IF no answer or fail, THEN registration is suspended

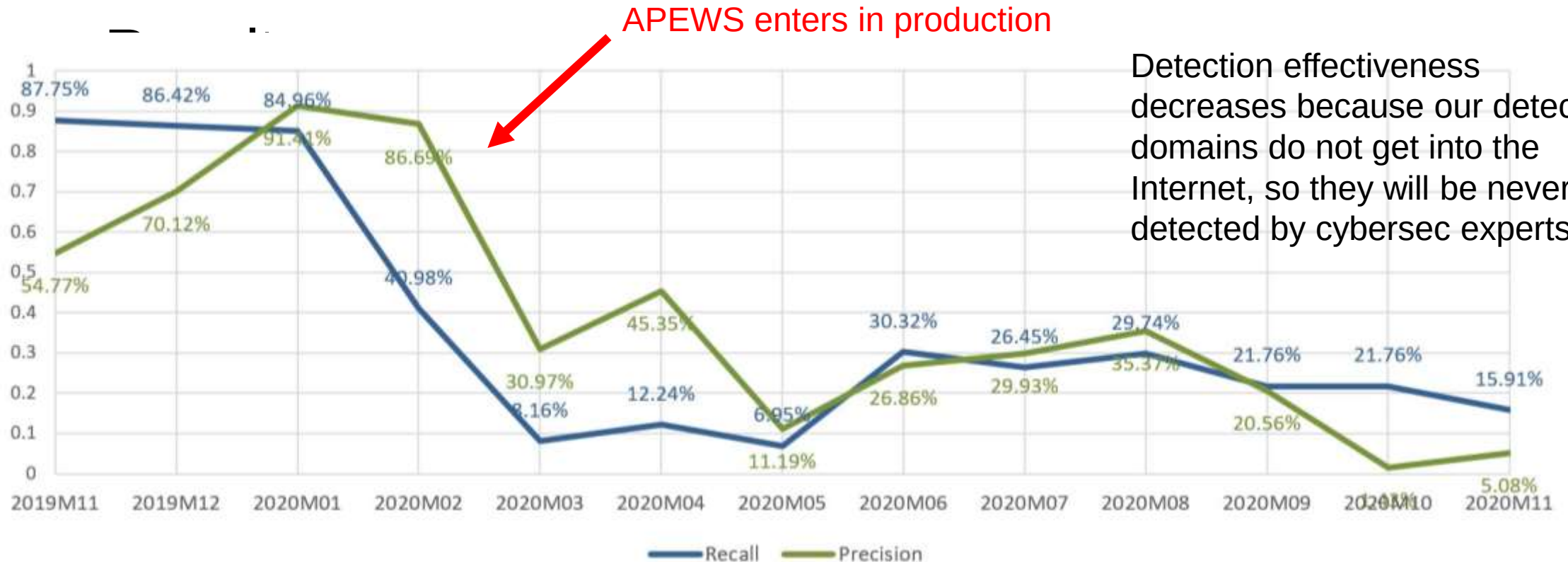
APEWS

- It is our first filter to prevent ~~malicious~~ suspicious registrations
- Re-trained autonomously regularly
- Combined with post-delegation heuristic alleged abuse detection + human review
- Flagged registrations are:
 - Sent to our identity validation checks
 - Shared with cybersec partners and LEA for their study

APEWS

- **Patented!**
- **Results:** Very good results at pre-production. Once running, the feedback loop is lost as suspended domains detected by APEWS that failed to validate its ID, never get into the internet, so no cybersec (and no one) will ever see them (see next graphic/slide)

APEWS



Recall = Of those that were abusive, how many were found ?

Precision = Of those predicted abusive, how many were correct

WebClass

- ML multilingual web page classifier
- CENTR task force: defined labels, developed tools (Taxinomos) and shared knowledge
- We need loooooots of examples to train the classifier to identify the classes (Health, Industry, Government, ...)
 - Common Crawl
 - Our own manual classifications

WebClass

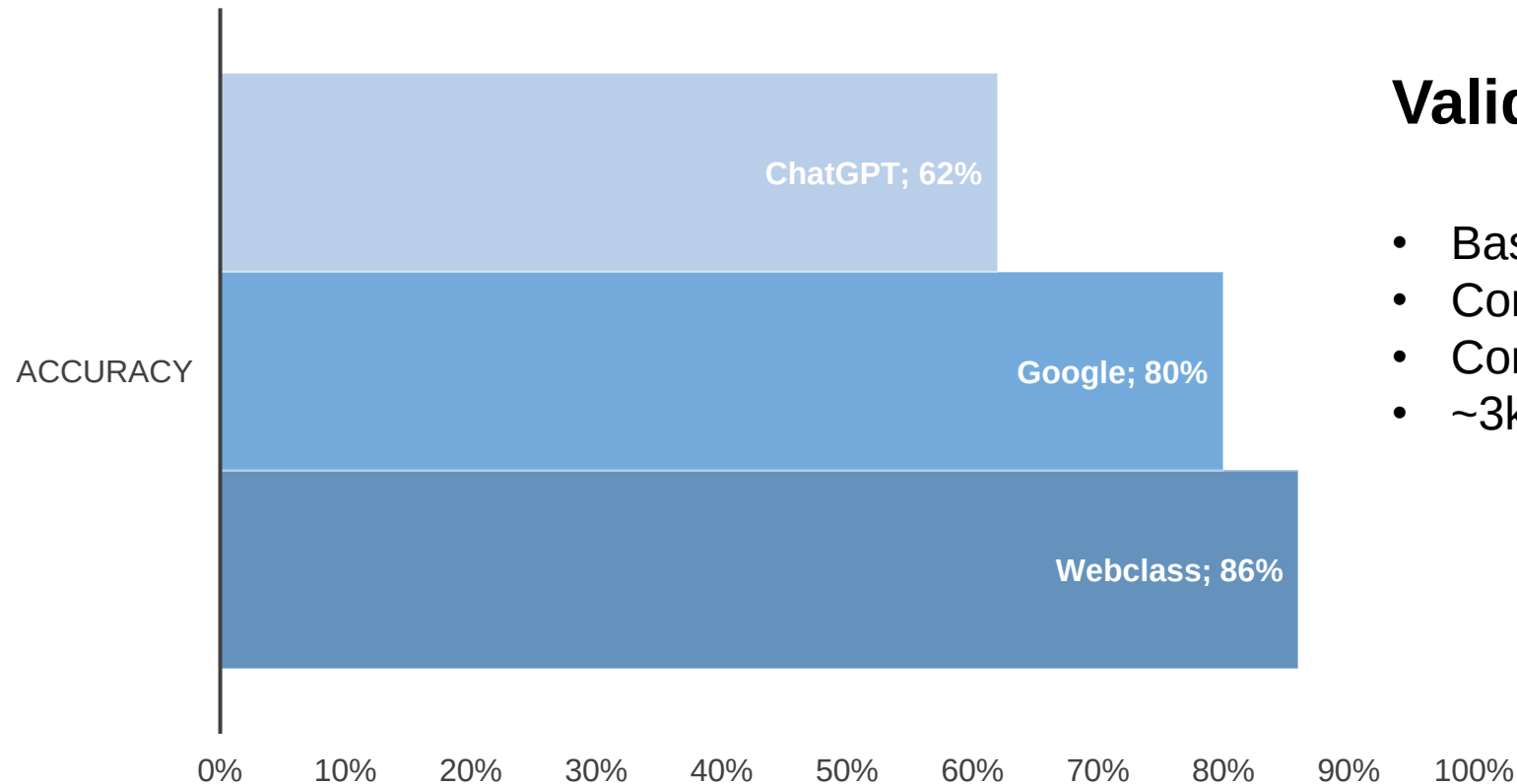
- **Problem:** for .eu, multiple languages, and not all categories are well represented in every language
- **Solution:** As English was the most used language in .eu, we used it to train WebClass
- **Process:** Get web page → Select text → English? →
No: translate (Google translate) → classify text
Yes: classify text

WebClass

- **Result:** CSV with % of probability to belong to each one of the pre-defined classes
- **Use:** Business Intelligence, market analysis, ...
- WebClass replaced human classifiers by spring 2023
 - Faster: 1 day vs. 1 month (10,000 web sites)
 - Better: accuracy and consistency* (15% better than human anotators)

(*) Gilardi et al.; “ChatGPT outperforms crowd-workers for text-automation tasks”; arXiv, March 2023

WebClass



Validation of results:

- Base: Human Level Performance = 66%
- Comparison with Google Categorization
- Comparison with ChatGPT (basic prompt)
- ~3k Data samples

Dashboard

Classify

Classify Multiple

Users

Search requests

Classify

Enter new text or url

URL Text

New url *

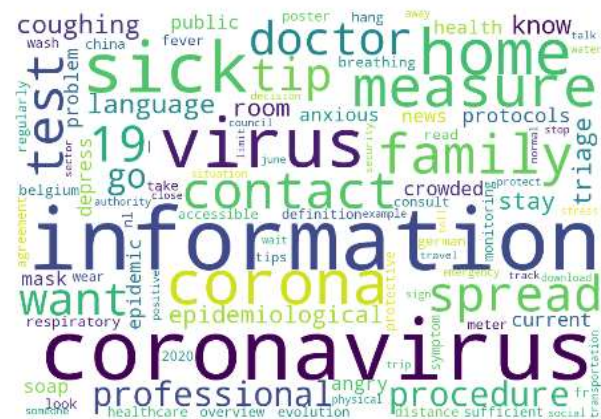
Algorithm *

Top classes

This can be a url or a domain name

Submit

WordCloud



Other information

Original content translated ?

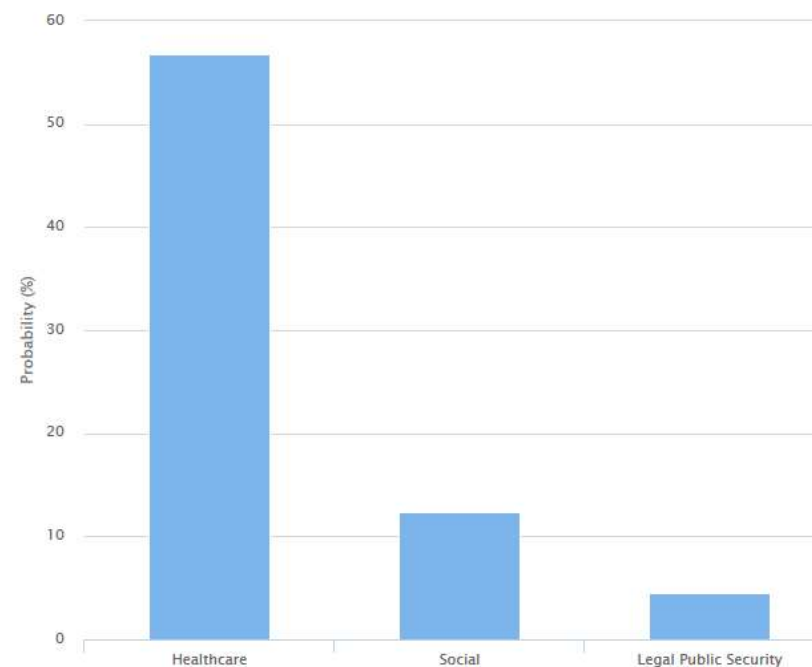
✓

Main language code detected

de

Results

Predicted categories for "https://www.info-coronavirus.be/de/"



https://www.info-coronavirus.be/de/

Is it correct ?

Choose...

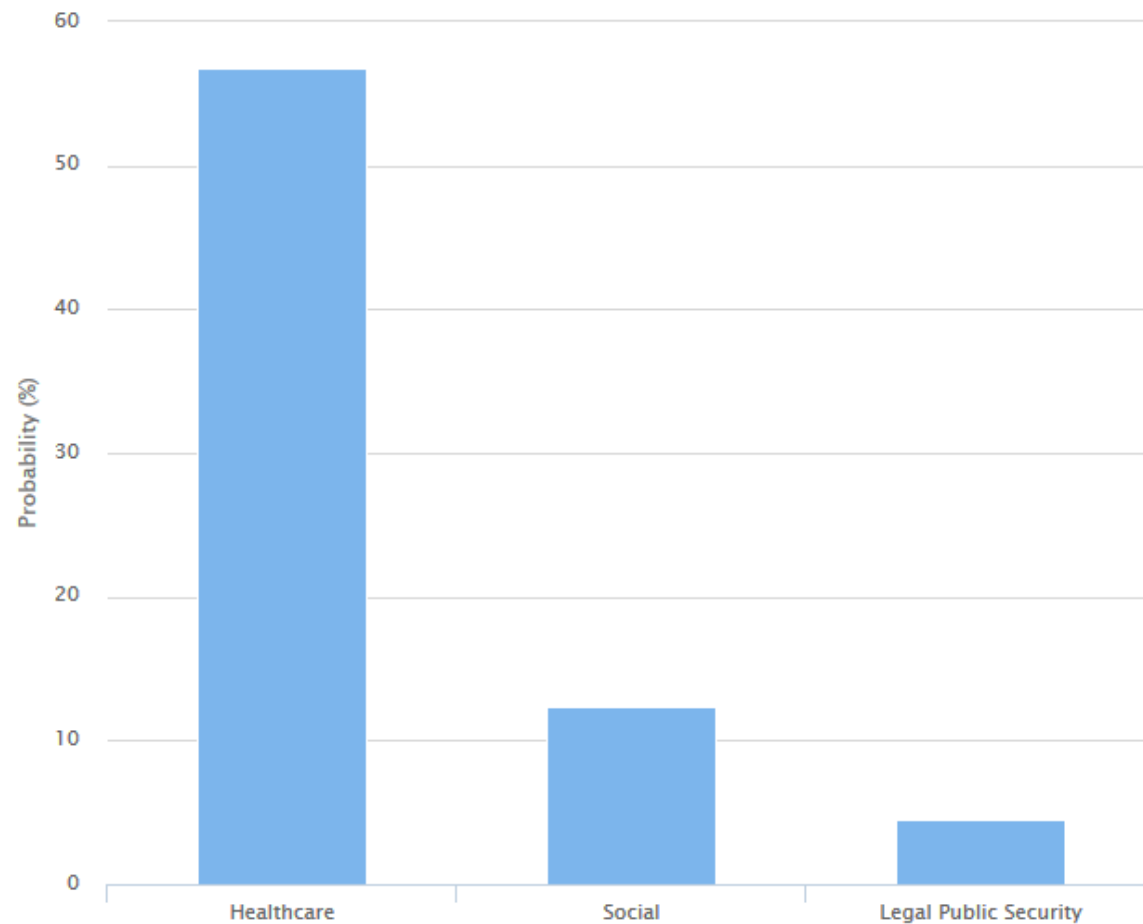
Screenshot

No search launched yet / no screenshot available.

WebClass

Results

Predicted categories for "https://www.info-coronavirus.be/de/"



https://www.info-coronavirus.be/de/

Is it correct ?

Choose...

NameGen-GPT

- **Goal:** to offer alternative domain names when the one you want is already registered
- **Problem:** EU/EEA (.eu) is a multilingual space. Impossible for us to develop language tools in all these languages
- **Lucky:** LLM* to the rescue!

(*) LLM = Large Language Model

NameGen-GPT

- **End of 2022:** would chatGPT be of any use? First tests and prototypes.
- **Winter 2023:** chatGPT takes care of multilingualism, translations and to generate interesting proposals
- **CENTR Jamboree (may 2023):** EURid presents a working prototype

Generate

Method *

Similar words

Language *

English

Keyword *



Submit

Explanation

Here the given keyword is taken and a lookup for "matching" words is performed using the word vector structure for the given language.

Conclusions

- AI/ML/GPT tools are, every day, more available and performant
- Registries can easily use them, even if small team ...
- ... but need to take into account:
 - Data bias & algorithm fairness
 - Laws and directives (GDPR, AI act, ...)
 - Human review of decisions
 - System re-training
 - Social and environmental impacts

See EURid's presentation
at CENTR Jamboree 2023

Conclusions

- Anyone can start small and build with available parts
- We need to rethink how a registry can change, evolve and benefit on top of these new foundations

“EURid as/is an AI-minded registry”

Thanks! Questions?

..eu ..eю ..ΕU

Powered by **EURid**