Pseudonymisation As A Service

and Data Protection Assisted by Computers

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Why controllers fail with pseudonymisation ?

- **Fundamental pseudonymisation problems :**

  ① Controllers don't know what to protect.

  ② Controllers don't know which function to use.

  — People are not trained to data protection.

- **Can we solve these two issues ?**

  — Use programs to identify sensitive data.

  — Delegate/outsource pseudonymisation.

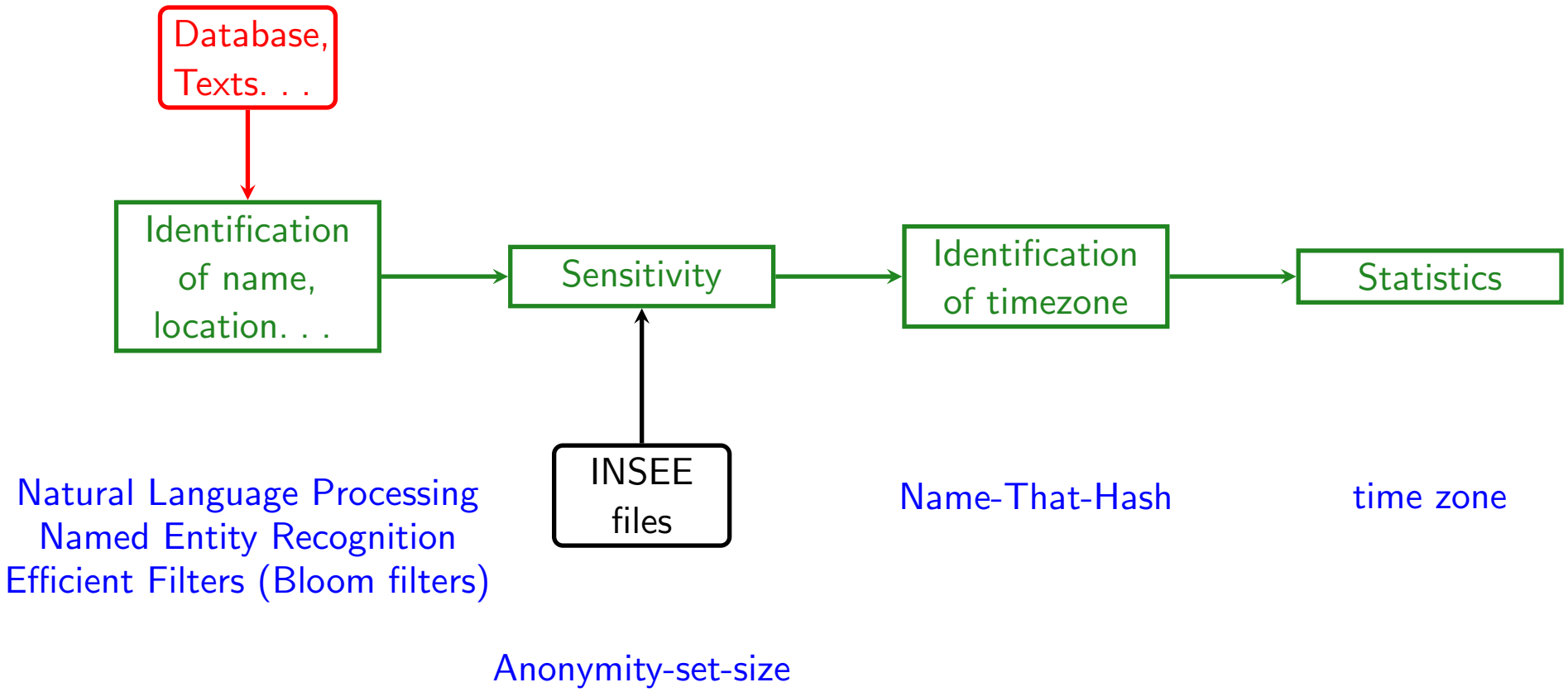
Importance of personal data identification

- **Fundamental task for Data Privacy Officers :**
  - Privacy Impact Assessment
  - Data Protection Enforcement
- **Difficult task for DPOs :**
  - Easy to underestimate data sensitivity.
  - Weak spot of the security foundations
- **Can computers assist DPOs ?**

How to identify personal data

- **Main obstacles to automatisation :**
  1. Machine learning
     - Filtering with efficient lists
     - Named Entity Recognition (NER)
  2. Pseudonym identification
     - Entropy (behave to random values)
     - Name-That-Hash
  3. Statistics

Our Detector Architecture



- **There are some limits :** sensitivity is contextual.

Local Pseudonymisation

- Data controllers have their pseudonymisation scheme
  They need to use secure schemes.

- **People need to be trained.**
  People need to make the good choices to avoid mistakes and data breaches.

- **Alternative :** call an expert and outsource pseudonymisation.

Outsourced Pseudonymisation

Advantages

- **Training :** nobody need to be trained.
  You need to know an expert.
- **Up-to-date :** responsability of the expert.
- **Limited responsability :** you can blame the expert.
- It is not my fault :

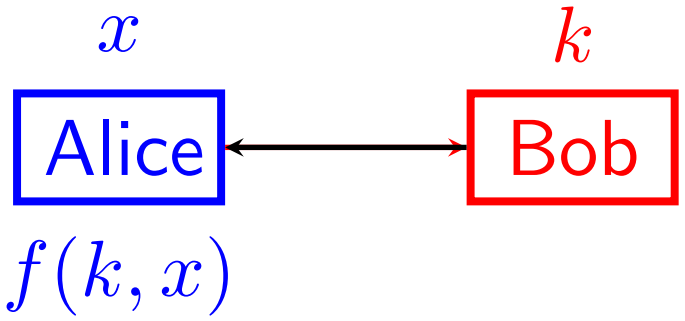
Problem with Delegation ?

Problems

- There are legal implications !
  The entity which pseudonymises is a data processor.
- The data must be transferred. . . (secure channel)
- We centralised personal data on a single server.
  Risk of data breaches !
- **Cryptography to the rescue :** OPRF.

Oblivious Pseudo Random Functions

- An **Oblivious Pseudorandom function** (OPRF) is a protocol that allows a party Alice to securely compute a pseudorandom function $f(k, x)$ on an input x contributed by Alice and on the key k contributed by Bob, such that :
  — Alice doesn't learn k
  — Bob learns nothing from the interaction



Conclusion

- **Computers can assist DPOs and DPAs !**
  We can automatise painful tasks (aka audit)
  DPOs and DPAs can focus on more important topics.

- We need Data Protection Assisted by Computer :
  - Personal data detector (for PIA,. . .)
  - Pseudonymisation As A Service

- Otherwise, the GDPR cannot be fully enforced.
  We need to provide tools to DPOs and DPAs.