Data Protection Case Study II

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https://spring.epfl.ch/
Problem Statement

ACME Transports would to optimize their business. Why not crowdsourcing? Millions of people looking at your problem. So they decide to publish a number of trajectories followed by their tracks over time

Q1: How much information is in this raw data? How difficult is it to get it?

Q2: Can the data be obfuscated?

Q3: And what about publishing aggregates?
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- Time of trips
- Routes = customers
- Address of drivers?

In raw data this data can easily be inferred even with naïve algorithms
Q2: Can the data be obfuscated?
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- Obfuscation: modification, suppression, generalization

- From the information available to the adversary
  - Define property to be protected: “not possible to identify customer”
  - Probabilistic analysis

- Hide drivers addresses ~ Anonymization?
  - Three properties of Art 29.
    - Differential Inference Testing A Practical Approach to Evaluate Anonymized Data
      Ali Kassem, Gergely Acs, Claude Castelluccia
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Q3: And what about publishing aggregates? Where should ACME store these aggregates?
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- Location Aggregates enable:
  - Inference of further data (3\textsuperscript{rd} property of Art 29)
  - Membership attacks (1\textsuperscript{st} property – linkability)

- Differential privacy is of little help (correlation and sensitivity)
No hope for ACME?

- Offer an API
  - Studying leakage of query

- Ad-hoc algorithms for particular statistics
  - Beware of subsequent releases
  - No crowdsourcing anymore, predefined possibility

- Synthetic data
  - Infancy
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(See work by Hubaux/Ford for data sharing)