

iSocial Summer School  
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# Community-based Identity Validation in Online Social Networks

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# Outline

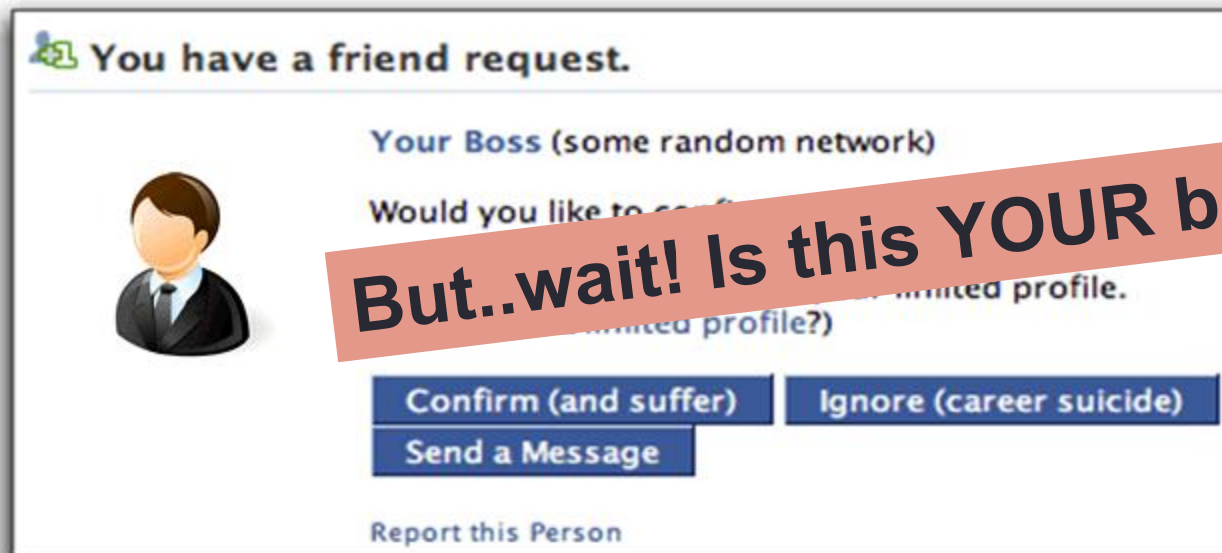
- Definition
  - Identity on an OSN
  - Valid identity on OSN
- Validity estimation from profile information
  - Community-sourcing
  - Ensemble-learning
- Validating identity, what for?

# Identity in OSN – what is it?

- The name? ...
- The profile picture? ...
- The collection of profile information? ...
- A holistic combination of:
  - actions,
  - behavior,
  - friends,
  - etc.? ...
- A match between the profile and the produced content/activity? ...

# Identity in OSN – what is a valid one?

Would you accept this request?



# Can the OSN help with some indication on the validity of 'MY' boss's profile?



# Why profiles & why the community?

- Towards decentralization:
  - Every peer owns a profile
  - Peers are the community

# Some insights from sociology ...

- A relatively coherent and integrated identity is individuals' psychological and societies' need:
  - *“the final identity, [...] includes all significant identifications, but it also alters them in order to make a unique and reasonably coherent whole of them.”* Erik Erikson, as in Shwartz, 2011.
- Identity formation happens within sociological configurations:
  - *“The final formed identity converges to satisfy consistency with regard to some socially assimilative models.”* P. Schachter, 2004

# What can we deduce from a profile?

- Think about the process by which we filter profiles ...
  - Presentation!
  - Completeness!
  - Soundness!
  - Homogeneity!
  - ... anything else ...

**Coherence?!**



# Profile coherence for identity validation

- Coherence should be expected
  - Where?
  - At which level?
  - To which extent?
  - Who can judge?

# Profile coherence for identity validation

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**Coherence is expected at the level of some sub-parts of a profile → Correlated Groups**

# Community explicit feedback

- Community can say which attribute profile groups are expected to be coherent

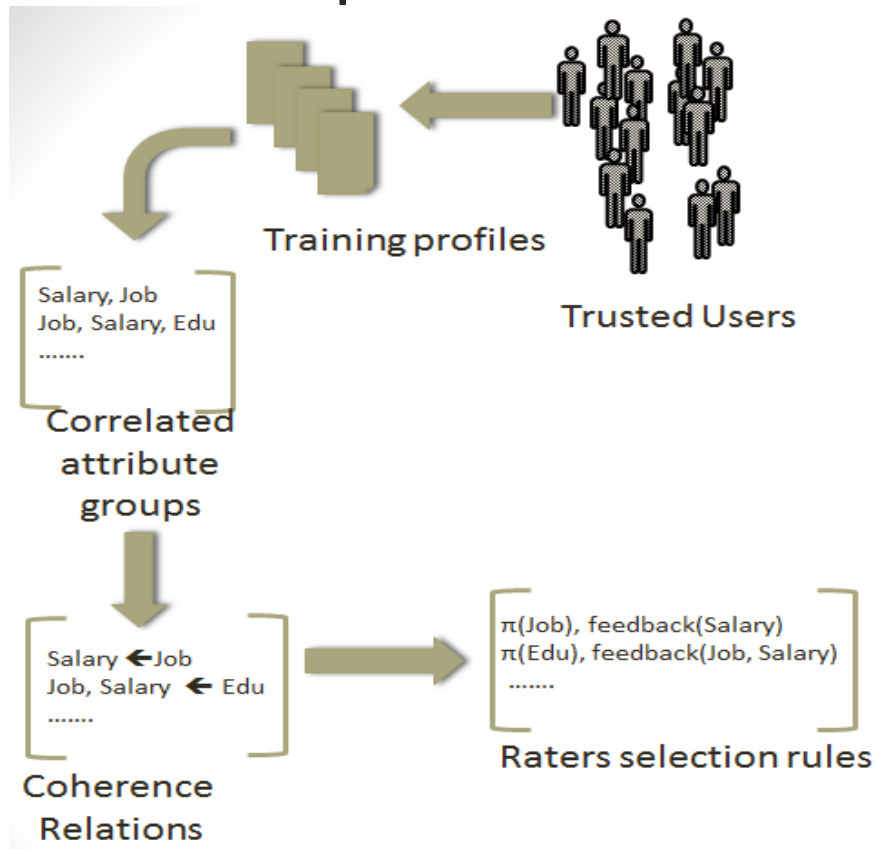
→ Identify correlated groups

- But..., some correlated groups might be community specific!
- Community reveals the correlated groups from a training profiles set

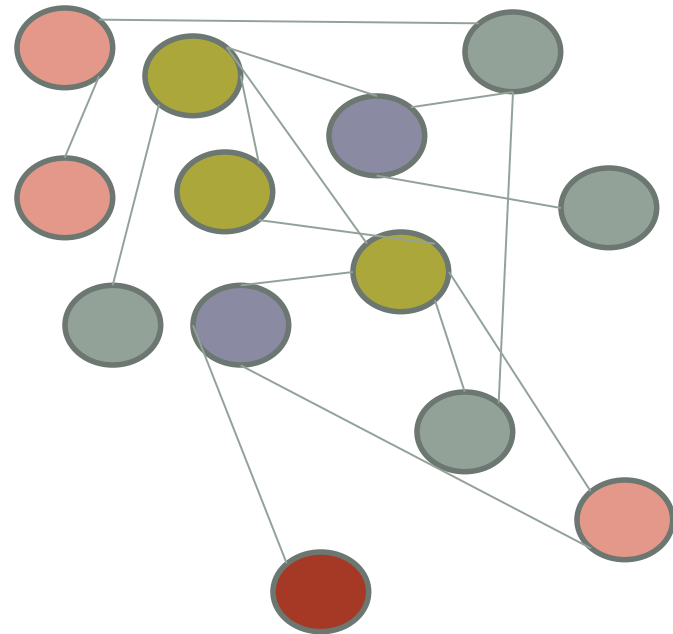
# Identifying correlated groups

- Learning from the community

- via explicit feedback



- via ensemble learning



# Experiment on real data

- 70 training profiles with 12 attribute-schema (Facebook)
- 35 trusted users
- 55 testing profiles
- 18 raters
  - 10 correlated groups
  - 0.89 precision in rating testing profiles

# Are we learning stereotypes?

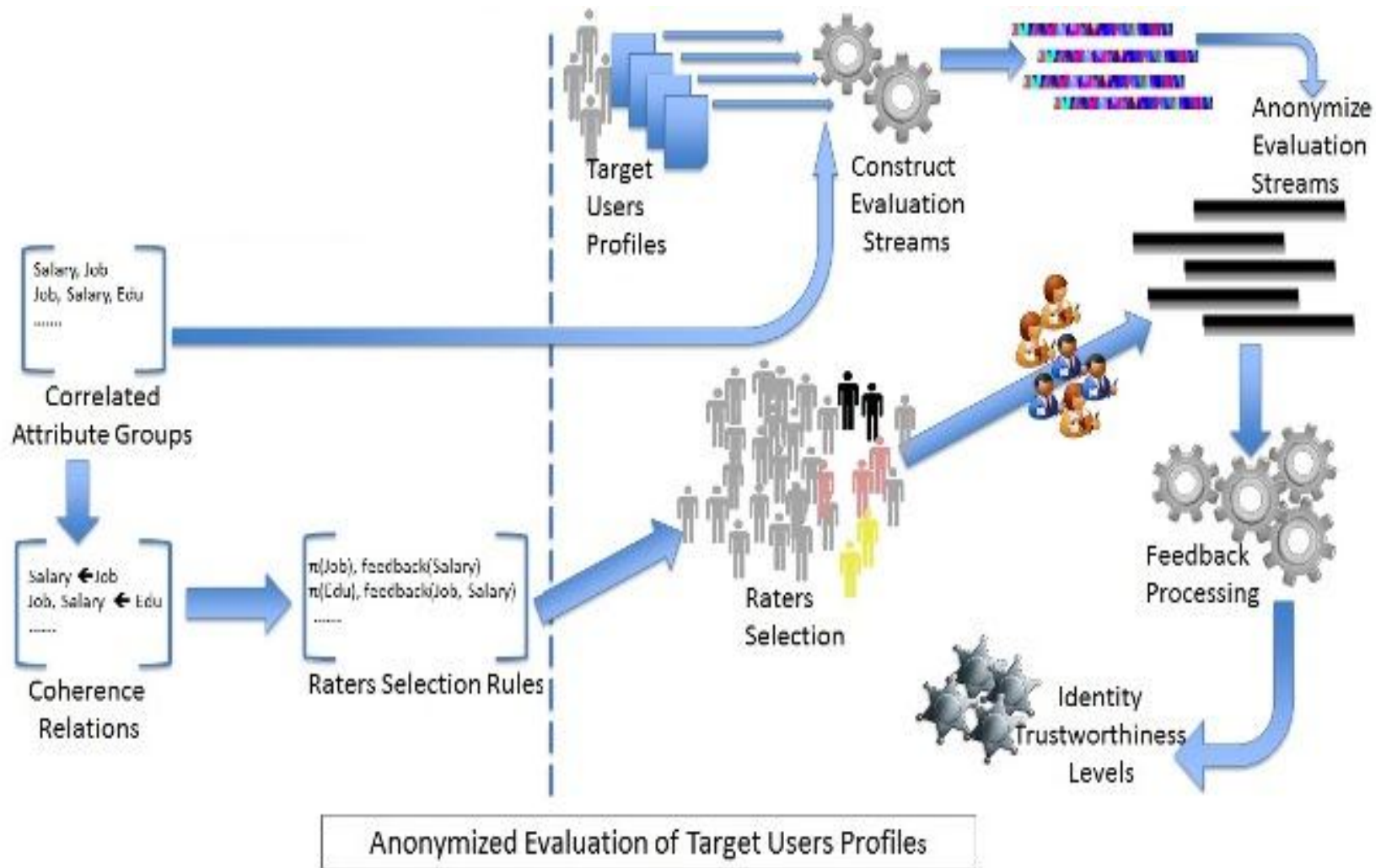
- *A correlated group = Ed. Major and Practiced Sports*
  - is this a stereotype?
    - Registered participation in sports' clubs is *linearly correlated* with the educational major (Corr.Coeff = 0.78)
    - Correlated Equilibrium argument: *conformity within groups*. E. Cartwright, M. Wooders, 2012.

# Notes on privacy

- Profile attribute values are being revealed!!!
  - Private values disclosure
  - Private information inference
  - Identification → collusion



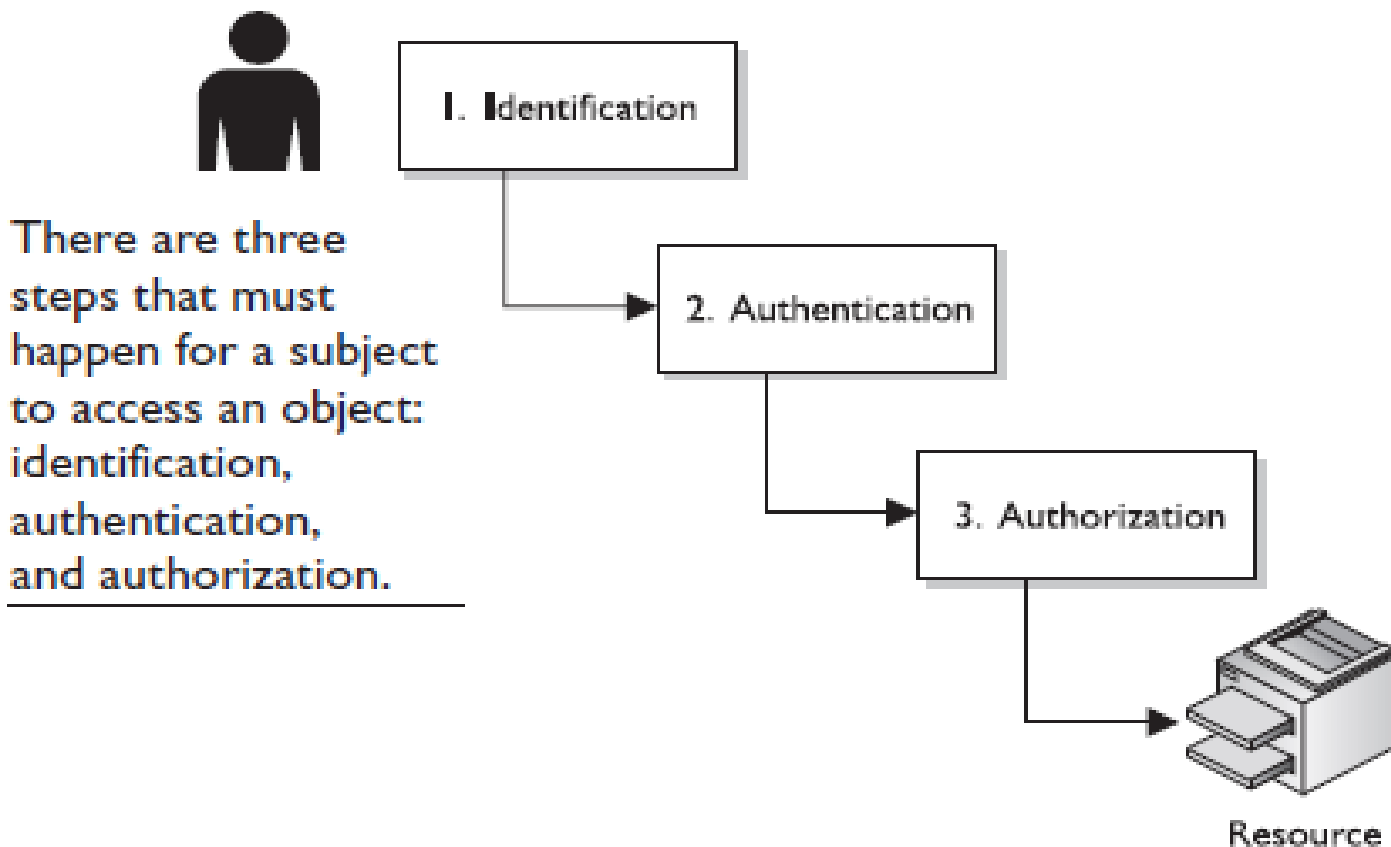
# Redesigning for privacy





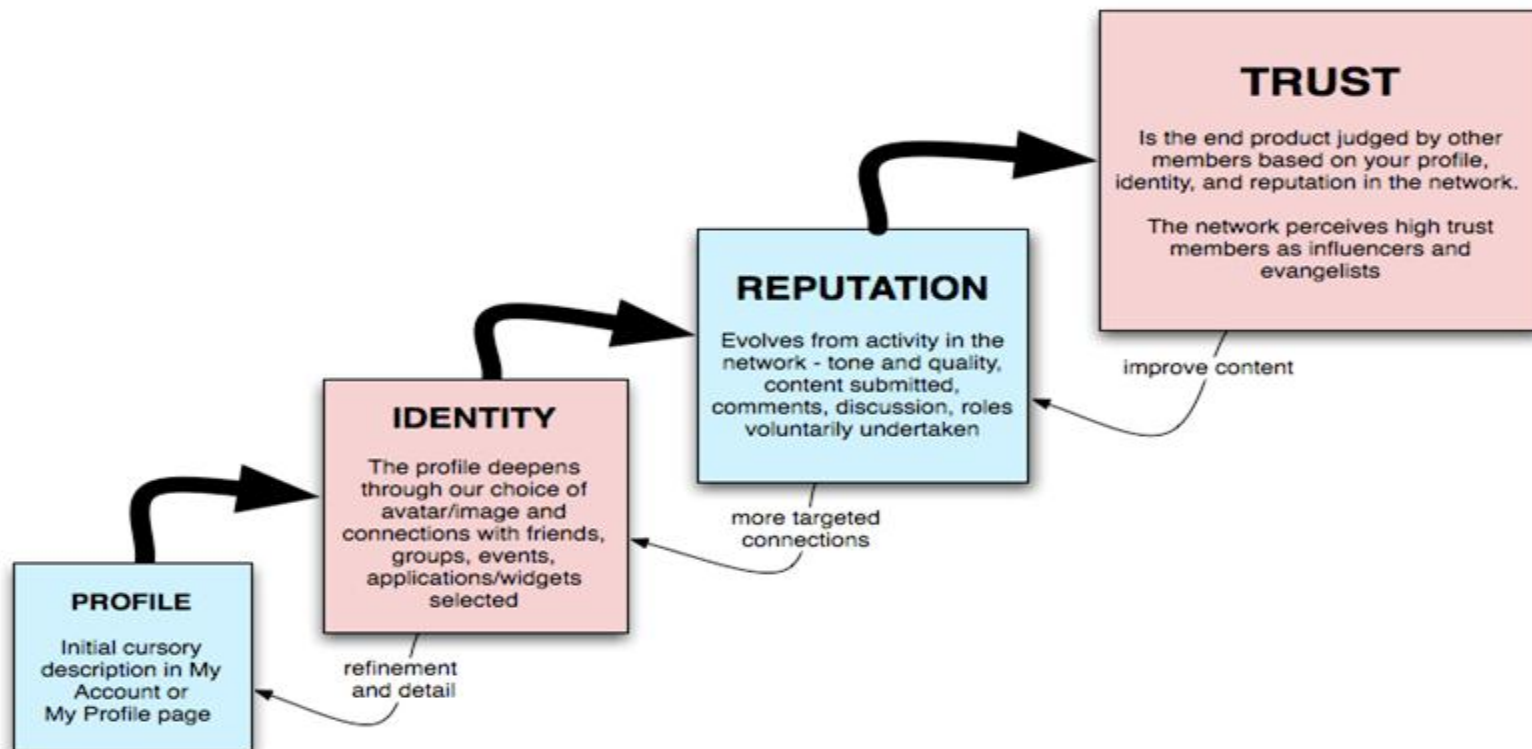
# Identity validation – what for?

## 1. It is the first step in **ACCESS CONTROL**



# Identity validation – what for?

## 2. It is a building block for **REPUTATION & TRUST**



# Community-based Identity Validation in OSNs

L. Bahri, B. Carminati, E. Ferrari,

***Community-based Identity Validation on Online  
Social Networks.***

In Proc. of the [34th International Conference on  
Distributed Computing Systems](#) (ICDCS), June 2014.



Thank you

*... for your beautiful  
attention*