

## Project Objectives

Starting from the requirements derived by the current regulation and legal debate, we intend to develop formal models and technical tools to enforce the **intertwined personal rights** of non-discrimination and individual privacy.

- ✦ On the **legal perspective**, our objective consists of a systematic and critical review of the existing regulations, and in the design of quantitative measures of the notions of anonymity, privacy and discrimination that are adequate for enforcing such personal rights.
- ✦ On the **computer science perspective**, we aim at designing legally-grounded technical solutions for discovering and preventing discrimination in Decision Support Systems (DSS) and for preserving and enforcing privacy in Location Based Systems (LBS).

We aim at a **new approach in the development of ICT tools** consisting in the native integration of legal norms and resulting in a technical standard which is legally recommendable and socially trustworthy.

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## Main Papers

- ✦ G. Finocchiaro. Privacy e protezione dei dati personali. Disciplina e strumenti operativi. Zanichelli, Bologna, 2012.
- ✦ G. Finocchiaro, A. Ricci, Quality of information, the Right to Oblivion and digital reputation. In Discrimination and privacy in the information society. Springer, 2012.
- ✦ S. Hajian, A. Monreale, D. Pedreschi, J. Domingo-Ferrer and F. Giannotti. Injecting discrimination and privacy awareness into pattern discovery. IEEE ICDM Workshop on Discrimination and Privacy-Aware Data Mining, IEEE 2012.
- ✦ S. Mascetti, D. Freni, C. Bettini, X. S. Wang, S. Jajodia. Privacy in geo-social networks: proximity notification with untrusted service providers and curious buddies. VLDB Journal, Springer, 2011.
- ✦ S. Mascetti, A. Monreale, A. Ricci and A. Gerino. Anonymity: a Comparison between the Legal and Computer Science Perspectives. In European Data Protection: Coming of Age. Springer, 2012.
- ✦ S. Mascetti, L. Bertolaja, C. Bettini. Location privacy attacks based on distance and density information. In ACM GIS 2013. ACM 2012.
- ✦ A. Monreale, D. Pedreschi, R. Pensa, F. Pinelli. "Privacy-by-design" for anonymity-preserving sequential pattern mining. Artif. Int. and Law, 2014.
- ✦ A. Romei, S. Ruggieri. A multidisciplinary survey on discrimination analysis. The Knowledge Engineering Review, 2014.
- ✦ A. Romei, S. Ruggieri, F. Turini. Discrimination discovery in scientific project evaluation: A case study. Expert Systems with Applications. 2013.

## Tools Developed

- ✦ *DCUBE: Discrimination Discovery in Databases.* Supports the discovery of discriminatory practices in a dataset of past decision records.
- ✦ *PCUBE. Privacy Preserving Proximity.* A location-aware app that alerts users about the proximity of friends without acquiring location data.
- ✦ *BF-P2KA:* a tool for anonymizing sequence data.



## COMPUTER SCIENCE AND LEGAL METHODS FOR ENFORCING THE PERSONAL RIGHTS OF NON-DISCRIMINATION AND PRIVACY IN ICT SYSTEMS

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# ICT Pervasiveness

ICT services are provided based on

**personal data**

collected at extreme detail and at mass level



What **we** buy



Whom **we** interact with



What **we** search



Where **we** go

# ICT Threats

While on one side the use of ICT technologies brings great benefit to everybody, on the other side the massive collection of our personal data poses new challenges to enforce the fundamental rights of privacy and non-discrimination

## PRIVACY

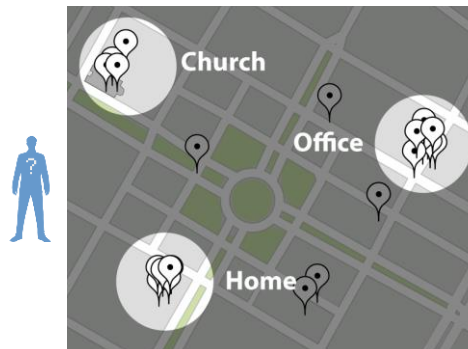
people have the right to control the processing of their personal data

*Who collects our personal information and how? Are the regulations in force a sufficient protection, or technical solutions needs to be applied?  
Is privacy a human right that risks to become a chimera in the digital era?*

### Sample privacy threat

User's identity and sensitive information could be discovered from the locations reported to ICT services

Location reported by a user



## FAIRNESS

people have the right not to be subject to unfair or discriminatory decisions based on their personal data

*How is our personal information used?  
Can negative effects of automated decisions be prevented? Is discrimination an illegal behavior that risks to become a hidden feature of ICT systems?*

### Sample discrimination threat

ICT services for automated credit scoring could use residence as a proxy for race or gender to deny credit to minorities

City residents by race

