Karlsruhe Institute of Technology

Privacy-Enhancing Technologies

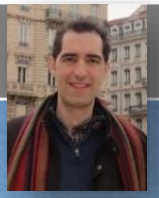
Lecture series Summer Term 2021

Dr. Patricia Arias-Cabarcos, Thorsten Strufe

12.04.2021 – KIT and TU Dresden – still in pandemic times

Disclaimer: This lecture was prepared in cooperation with Javier Parra-Arnau

Competence Center for Applied Security Technology



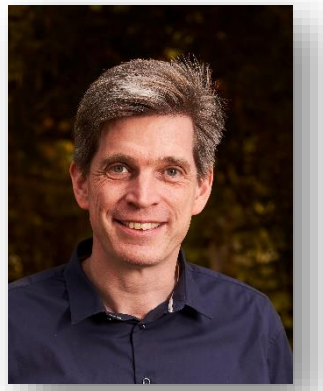
Outline of Today's Lecture

- Who are we?
- Organizational matters (preliminaries)
- Course outline

- A brief introduction

Who‘s Who

- Chair of Privacy and Security (PS)
- For the Lecture:
  - Dr. Patricia Arias-Cabarcos
    - KASTEL corridor
    - patricia.cabarcos[at]kit.edu
  - Thorsten Strufe
    - Chair professor
    - thorsten.strufe[at]kit.edu

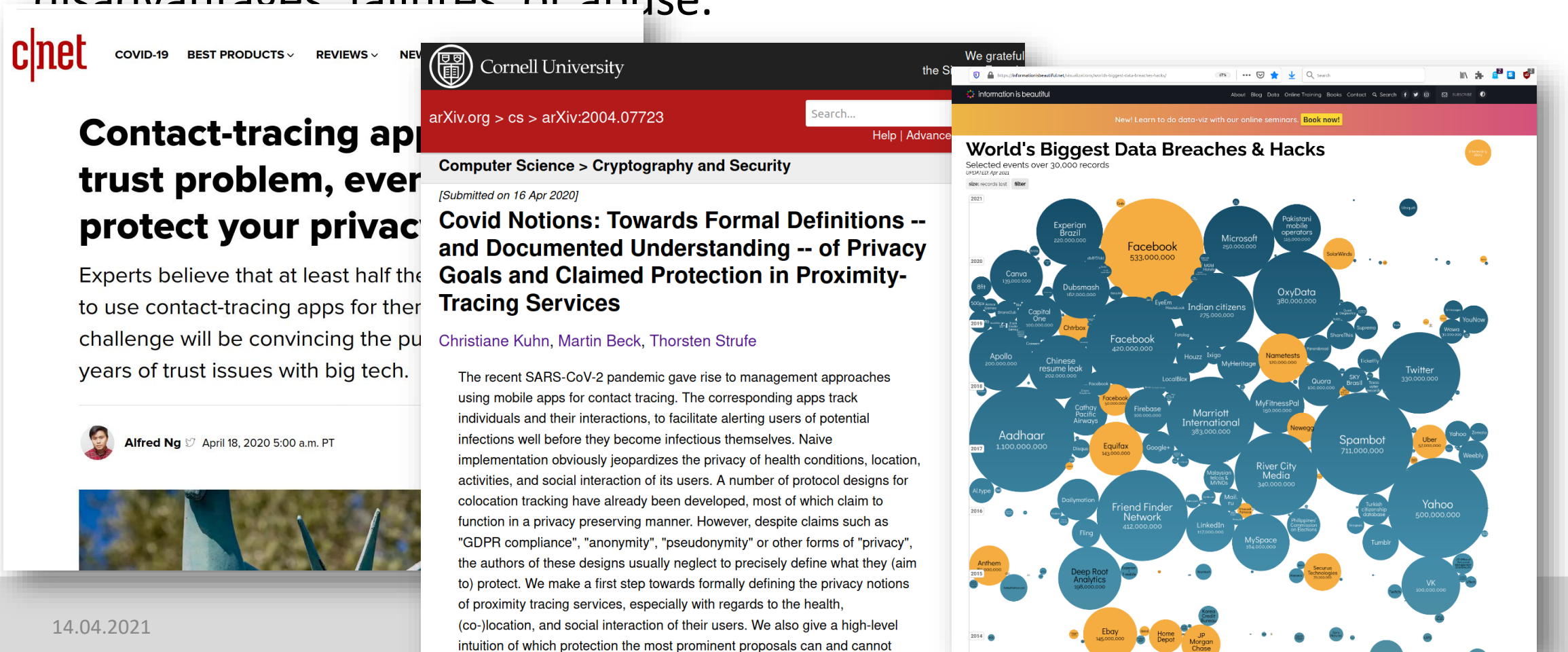


- Teaching Assistants/Exercise courses:
  - None
- Consultation
  - Send us an email or pass by, doors are open
- https://ps.tm.kit.edu/139_257.php

- Course language is English (you have a choice of Eng/Spa/Ger during the exam)
- There will be some ex-cathedra parts, but please ask and discuss as much as possible!
- This course is new, so the slides and content are subject of adaptation :-)

Some Words regarding this Course

- Main topic of this course is the ***privacy of individuals*** that are using (or surrendering their data to) IT, and ***how they can be protected*** from disadvantages, failures, or abuse.



Some Words regarding this Course

- Main topic of this course is ***the privacy of individuals*** that are using (or surrendering their data to) IT, and ***how they can be protected*** from disadvantages, failures, or abuse.
- We will analyze the adversary models and evaluation metrics underlying the design of privacy-enhancing technologies for that purpose.

- Learning outcomes
  - Critical reasoning about privacy
  - Gaining knowledge in the evaluation of privacy risks
  - Understanding of the design aspects of privacy-enhancing technologies
  - Familiarity with the latest research in the field
  - Ability to analyze and discuss the space of solutions to a given privacy problem

Preliminary Course Overview

Lecture (Mondays, 16:00h)

- Background and motivations for privacy
- Privacy metrics and adversary models
- Anonymous communications
- Data-perturbative privacy-enhancing technologies
- Anonymization algorithms for databases
- Homomorphic encryption and zero knowledge proofs
- Selective disclosure for identity management
- Usable privacy
- Applying privacy principles and case studies

The Reading Group (Exercise Course)

- Exercise course will be organized as a reading group
  - Papers (links) available on the webpage (soon, depending on |participants|)
  - Read papers early…
  - One paper with relation to lecture topics will be presented (by a random ***one*** of ***you***!) and discussed (by ***you***!) each week (please take note of the emphasize on ***YOU :-)***)
- This year there won‘t be acoding task (usually introduced in week 3-4, solved in groups of 2-3 students with help from us, to present last Thursday of the term, we‘re waiting for the pandemic to end)

More organization

- Exam:
  - Oral, make an appointment early (email Ms. Sauer/Ms. Gersonde)
  - Participation in the reading group is beneficial

- Literature (there isn‘t much…):
  - „The little blue book“ and „Privacy is hard“ (both: Jaap-Henk Hoepman)
  - Anonymous communication literature: *https://www.freehaven.net/anonbib/*
  - Check the „Privacy Enhancing Technologies Symposium (*https://petsymposium.org*)

  - „The age of surveillance capitalism“ (Zuboff), „Privacy is Power“ (Veliz), „The unsinkable aircraft carrier“ (Campbell)

  - „1984“ (George Orwell), or, simpler, „The Circle“ (Dave Eggers)
  - Cory Doctorow, etc.

Questions?