Challenges that Emerge When Systems and People Meet: Privacy and Accountability

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Does a System Do What It Is Supposed To?

• We often ask whether a computer program or system does what it is supposed to do.
• To do this, we need to know what the system is supposed to do.
• Example:
  – Proving a program P correctly sorts its inputs into ascending order.
  – For every input \((a_1, a_2, \ldots, a_n)\), program P produces an output \((b_1, b_2, \ldots, b_n)\), such that
    • \(i < j \Rightarrow b_i < b_j\)
    • For each \(i\), there exists \(j\) such that \(a_i = b_j\).
When Systems and People Meet

• Mathematical definitions can be elusive when the desired properties are more subjective in nature.

• Examples:
  – Privacy
  – Accountability
Privacy

• Means different things to different people, in different contexts.

• Appropriate uses of data:
  – What is appropriate?
  – Who gets to decide?
  – What if different stakeholders disagree?

• Simple approaches to “anonymization” don’t work in today’s world where many data sources are readily available.

• There are some good definitions for some specific notions of privacy.
Accountability

• Both in the real world and in Internet systems, people often express a desire for “accountability”.
• It is not completely clear in either case what this actually means, though typically it is about ensuring that people who don’t follow the rules suffer consequences.
• Questions:
  – Does accountability require everyone to be identified at all times?
  – Does accountability require those who break the rules to be identified?
  – To what extent can accountability be provided in large-scale, international computing systems?