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Using context-profiling to aid access control decisions in mobile devices




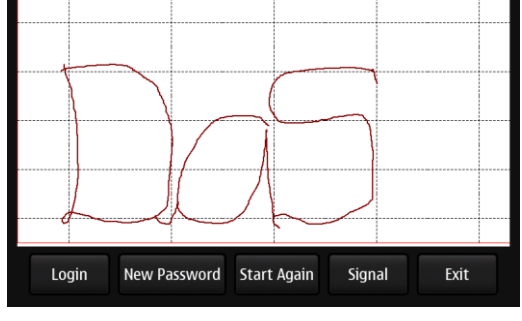
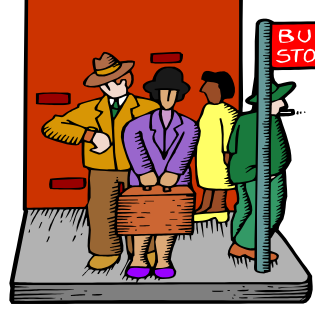
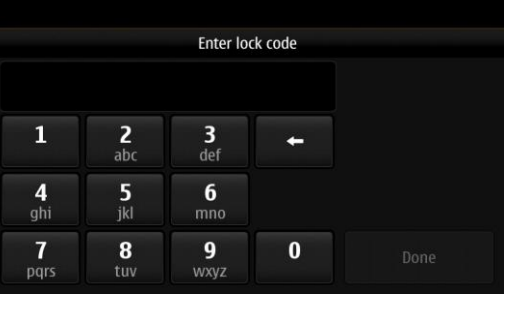
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MOTIVATION

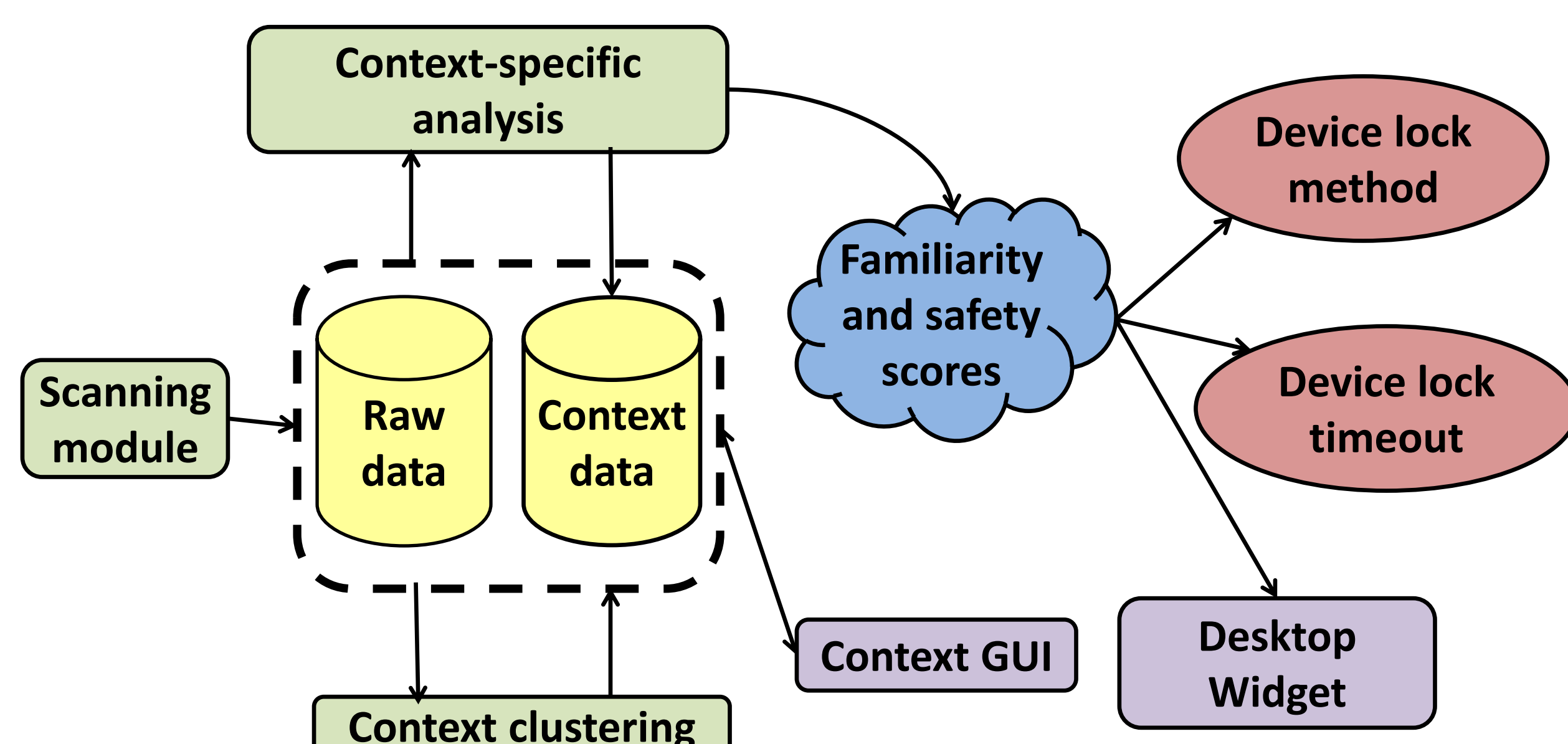
- **Configuring** access policies can be **cumbersome** for users.
- Utilize **cues from context/history** to automatically configure access control policies.

DEVICE LOCK USE-CASE

Configure **unlocking method** and locking **timeout** based on the perceived safety of current context

Context	Unlocking Method	Locking timeout
 Home	 Swipe lock	High (~ 60 minute)
 Meeting, Office cafeteria	 Draw-A-Secret lock	Medium (~ 20 minute)
 Bus stop	 Pin lock	Small (~ 1 minute)

SYSTEM COMPONENTS



METHOD OVERVIEW

- Scan context to collect contextual data
 - GPS data, Bluetooth devices, Wireless access points
- Analyze the collected data to:
 - Detect contexts of interest (CoI)
 - Calculate familiarity scores for CoIs and observed devices
- Estimate safety score for current context and use it to configure access policies

Estimating familiarity

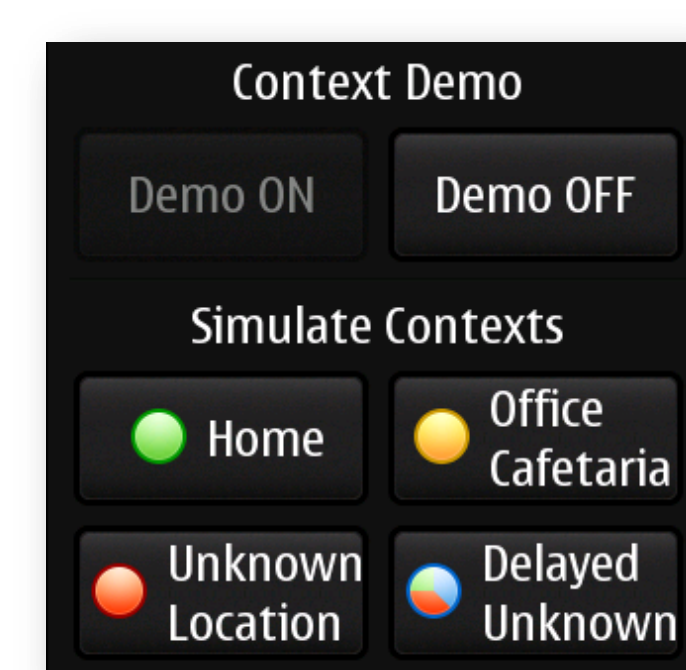
- **Context familiarity of device** is estimated based on **how often** and **how recently** it has been observed.
- **Instantaneous context familiarity** is the **familiarity of current snapshot** of context. It is estimated based on the number and familiarity of sensed devices.
- **Aggregate context familiarity** is the **“usual” familiarity** of a context and is computed as exponential moving average over instantaneous familiarity.

Estimating safety

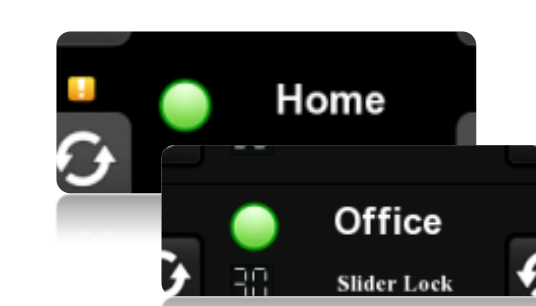
Safety Level	Instant Familiarity	Aggregate Familiarity
Green	High	High
Blue	High	Low
Yellow	Low	High
Red	Low	Low

DEMONSTRATION

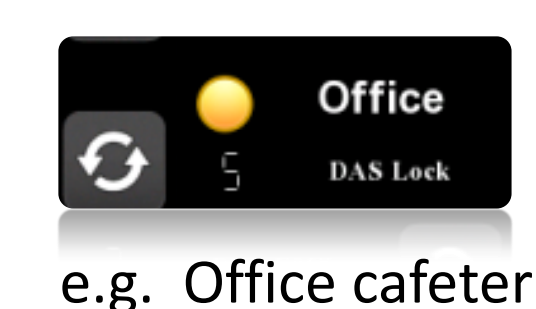
Simulate different context by replaying information from an old data set



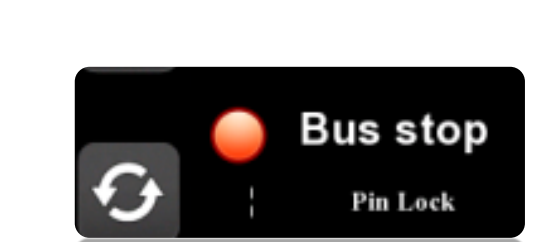
Demo Widget



Familiar devices, familiar history



Unfamiliar devices, familiar history
e.g. Office cafeteria



Unfamiliar devices, unfamiliar history