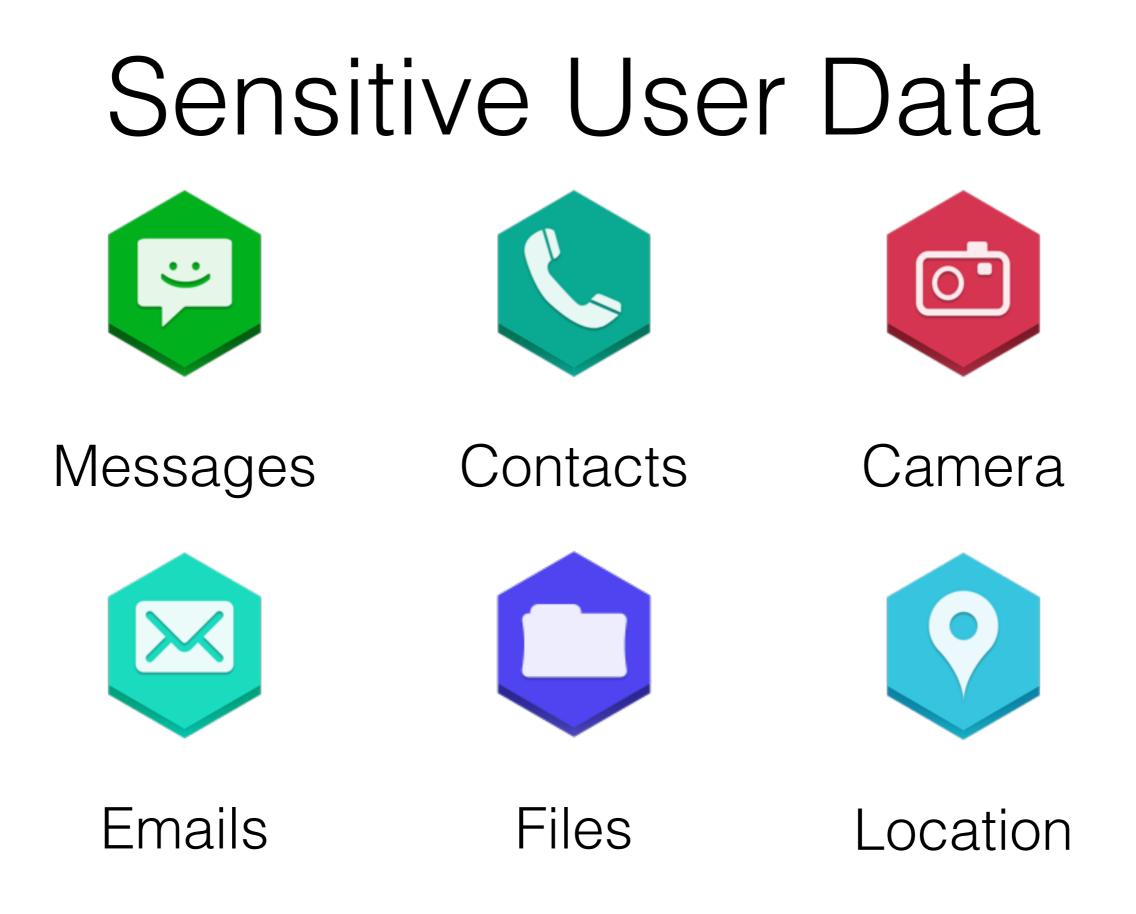
Conforming Permissions With User Expectations

Amir Rahmati, Harsha V. Madhyastha



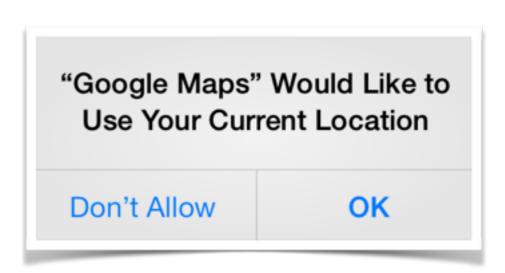


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	🗊 Google Play Store			
Do you want to install an update to this built-in application? Your existing data will not be lost. The updated application will get access to:				
	NEW	ALL		
PRIV	PRIVACY			
٩,	read phone status and identity			
þ	send SMS messages bits may cost you money			
Ŷ	NEW: approximate location (network-based)	
	NEW: precise location based)	on (GPS and network-		
Ŷ	modify or delete the contents of your USB storage			
	Cancel	Install		
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Install Time

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	NEW	ALL			
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	Cancel	Install			
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Install Time

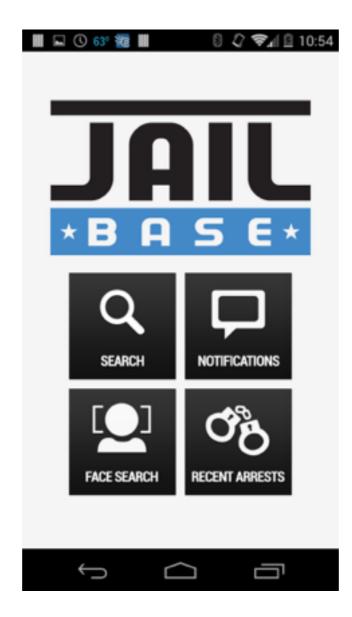


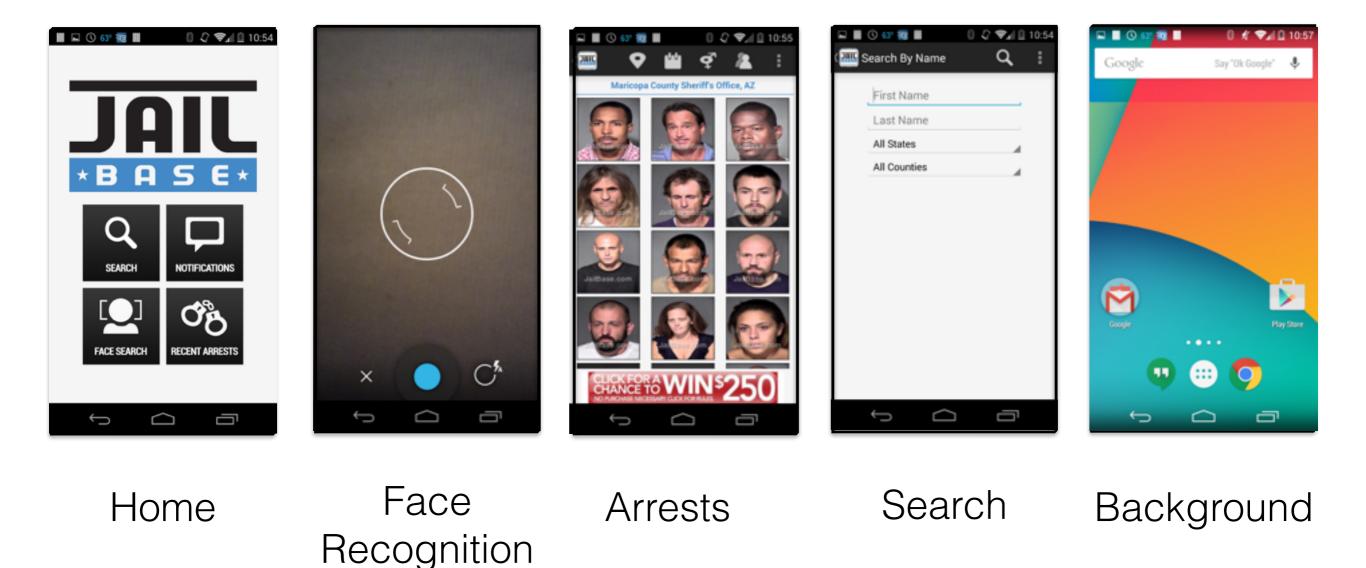
First Use

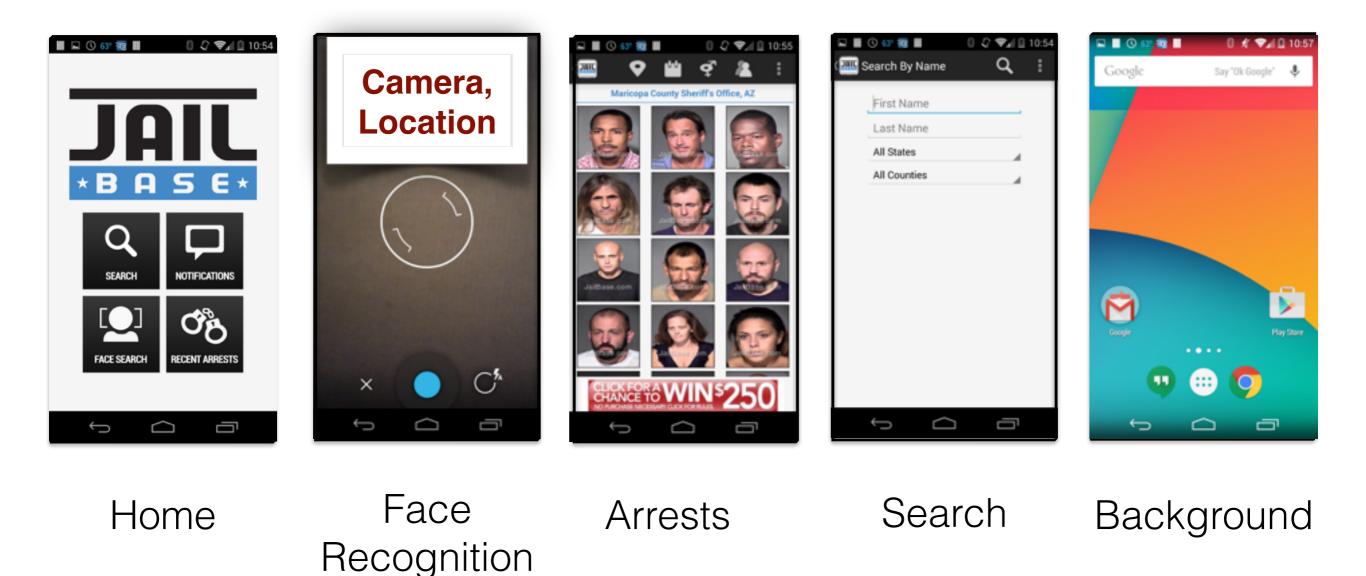


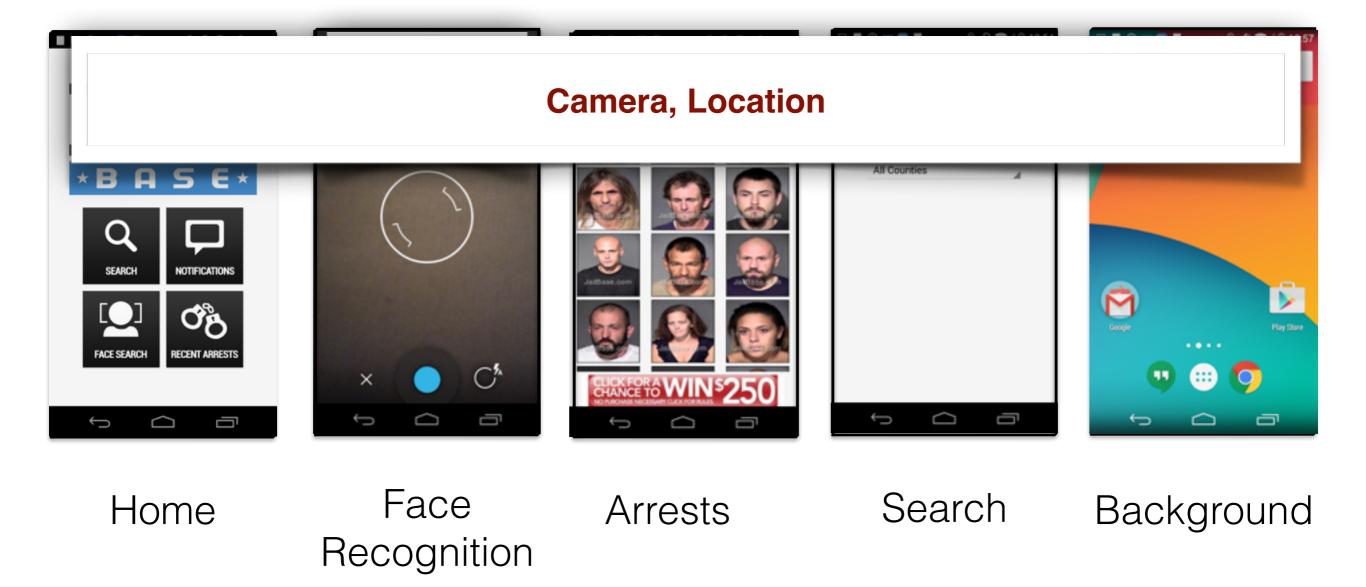
Install Time

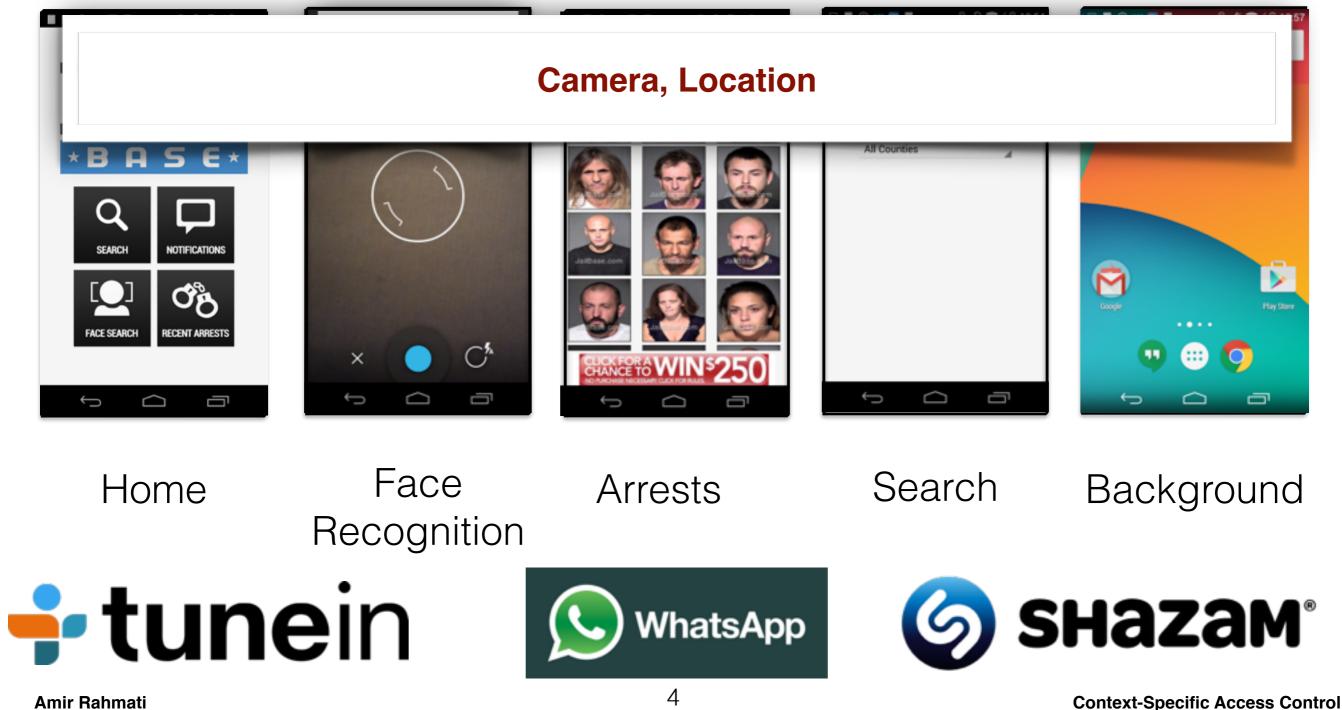
First Use



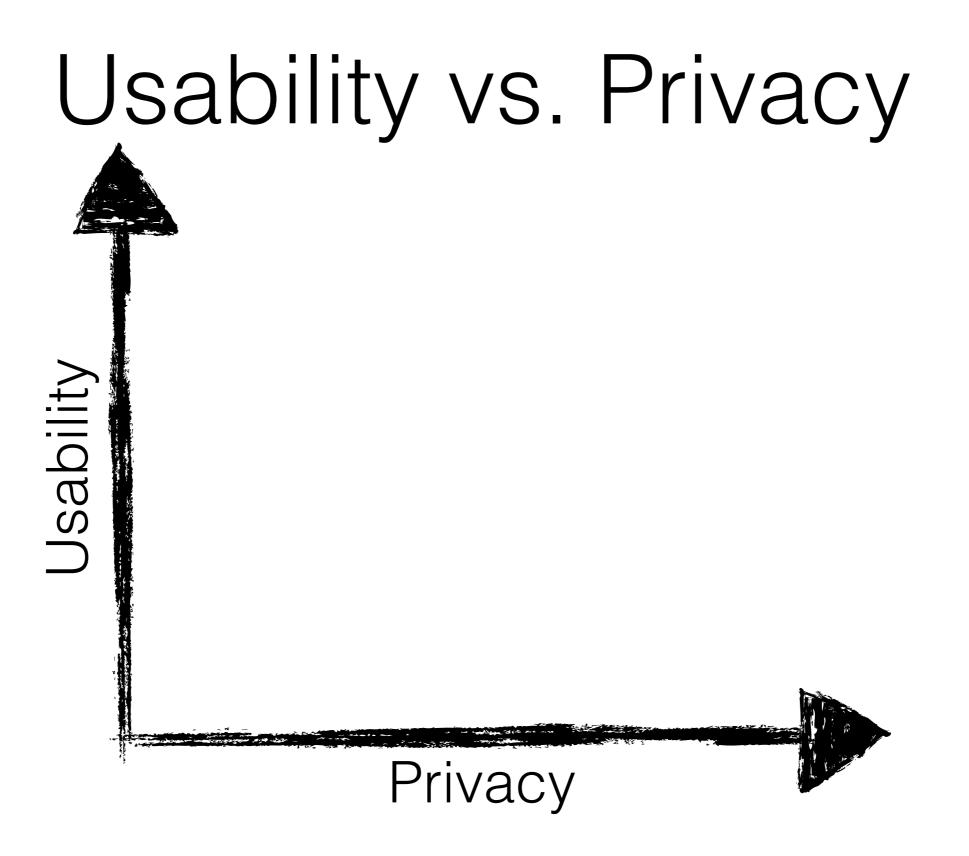


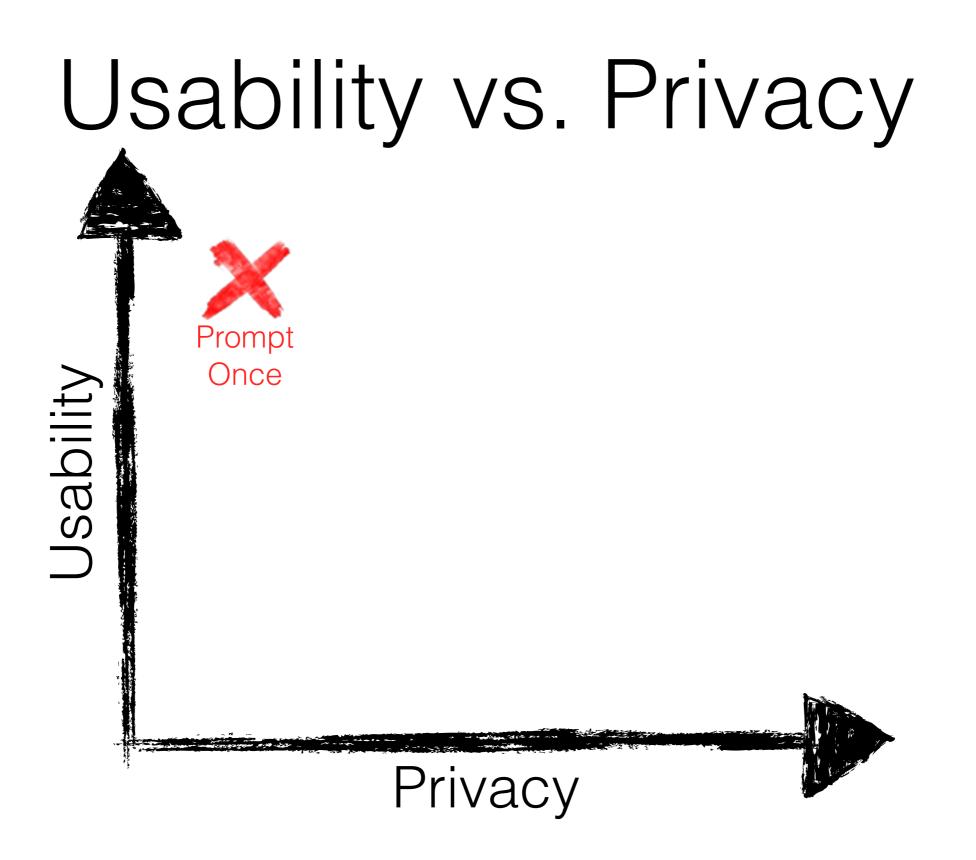


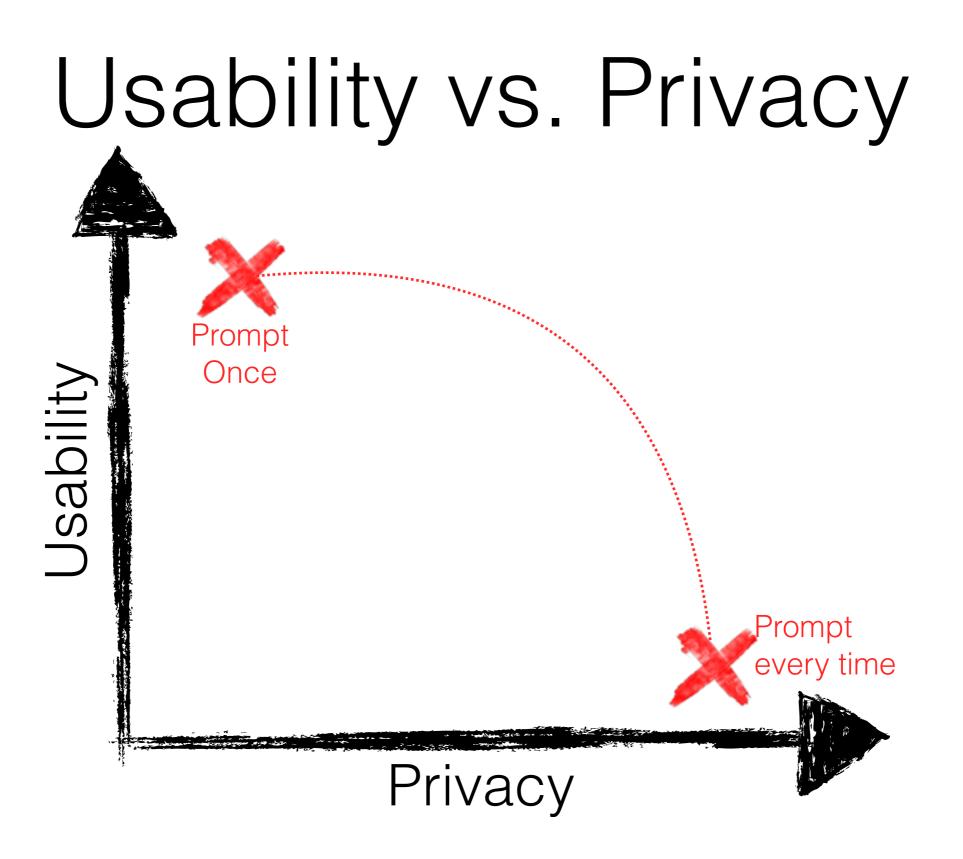


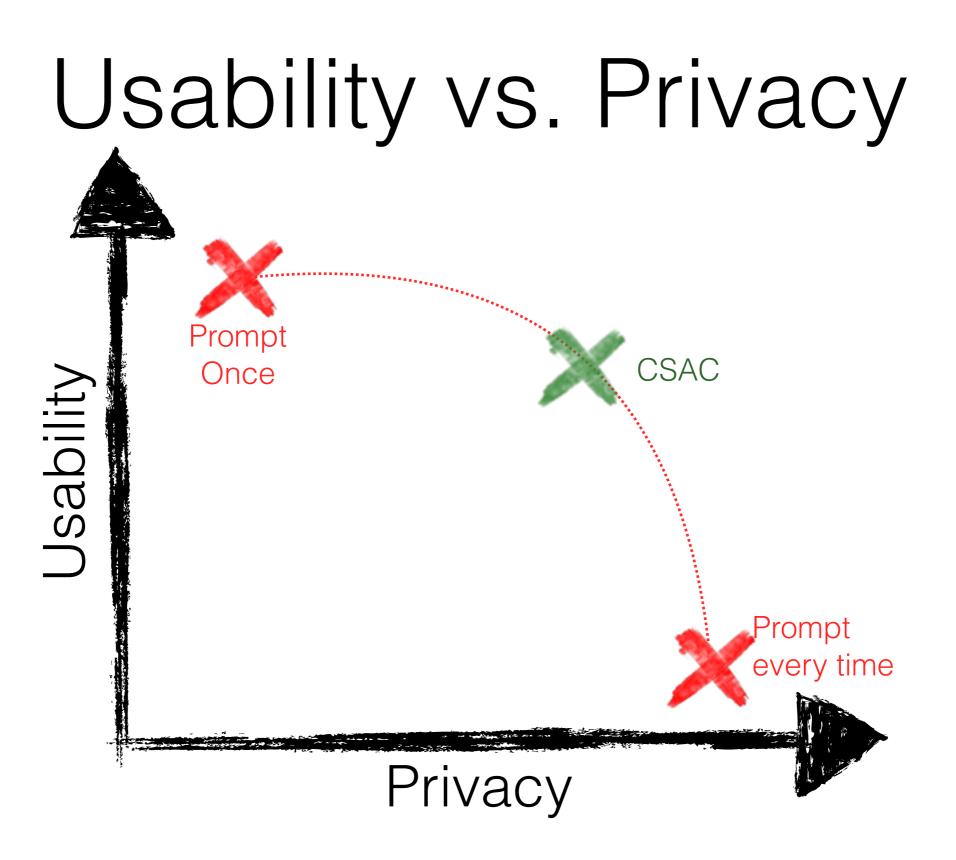


Amir Rahmati

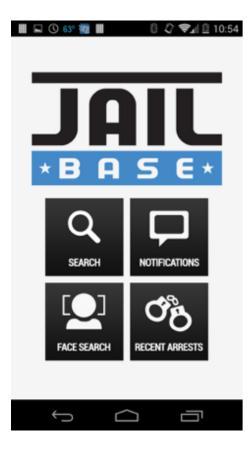


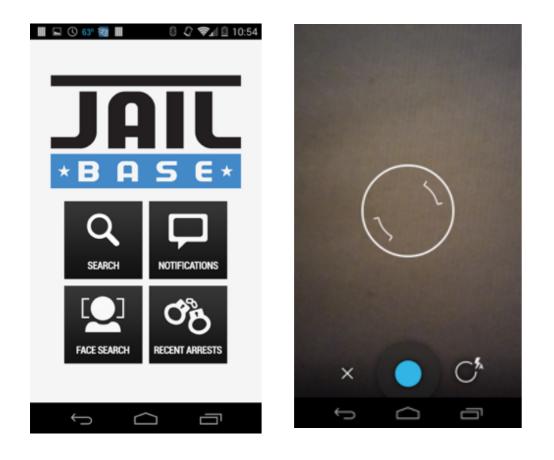




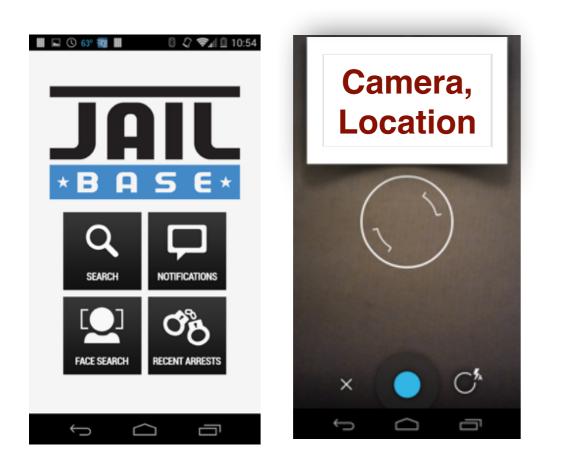


- Divide user's interaction with application to a limited number of contexts.
- Prompt user for access-control decisions upon first use per-context.
- Reuse access-control decisions when user returns to that context.

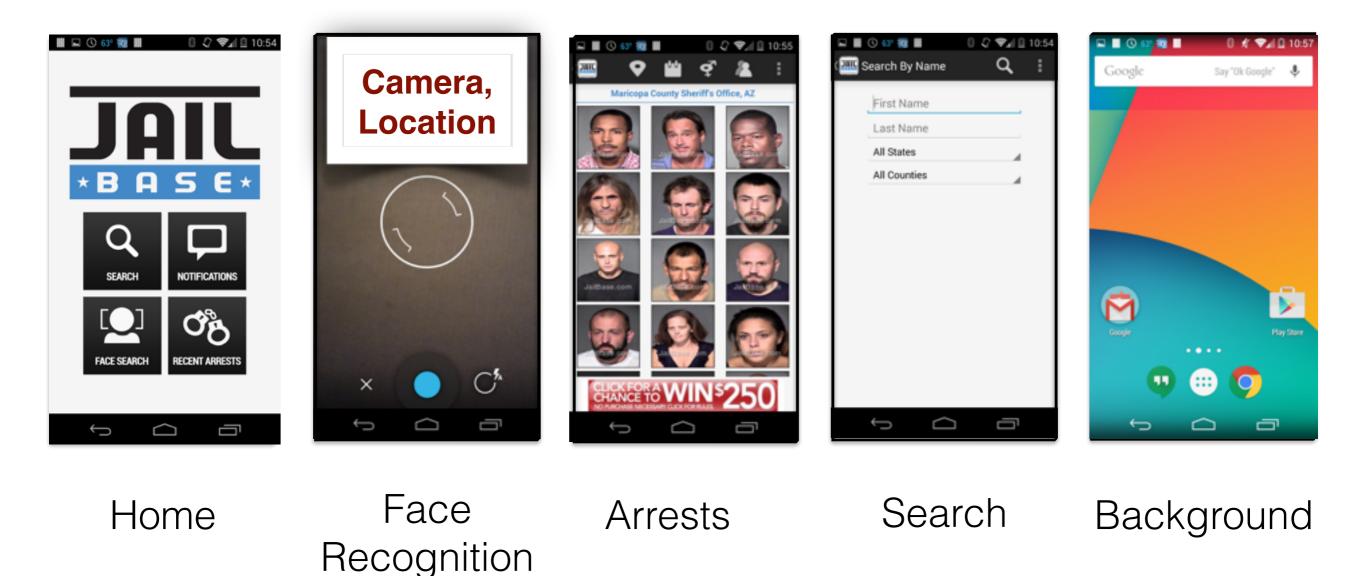




Face Recognition



Face Recognition

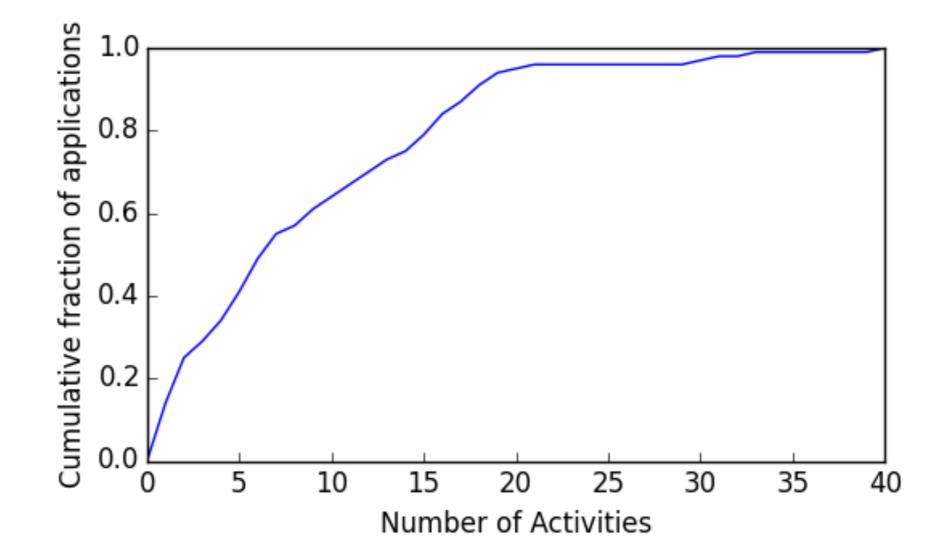


Feasibility

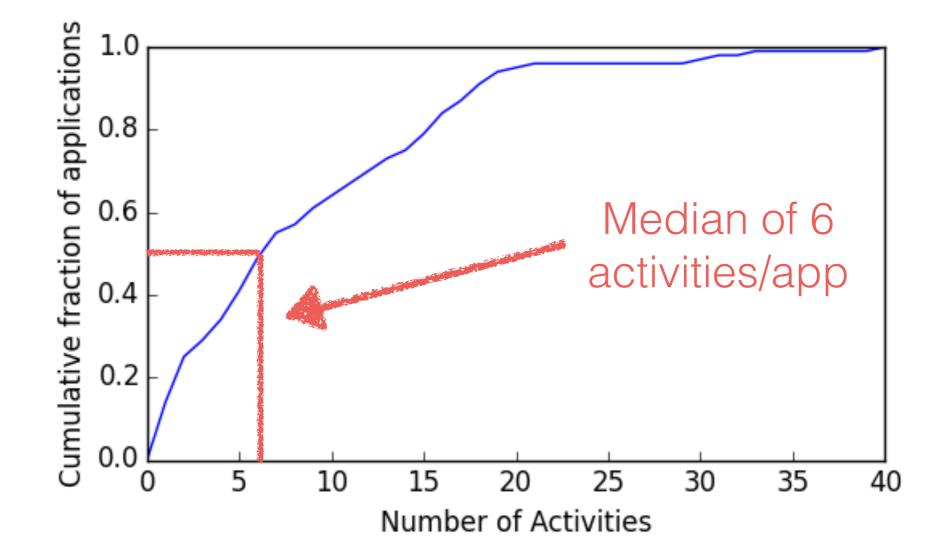
Feasibility

- Applications should be modular.
- CSAC decision overhead should be low

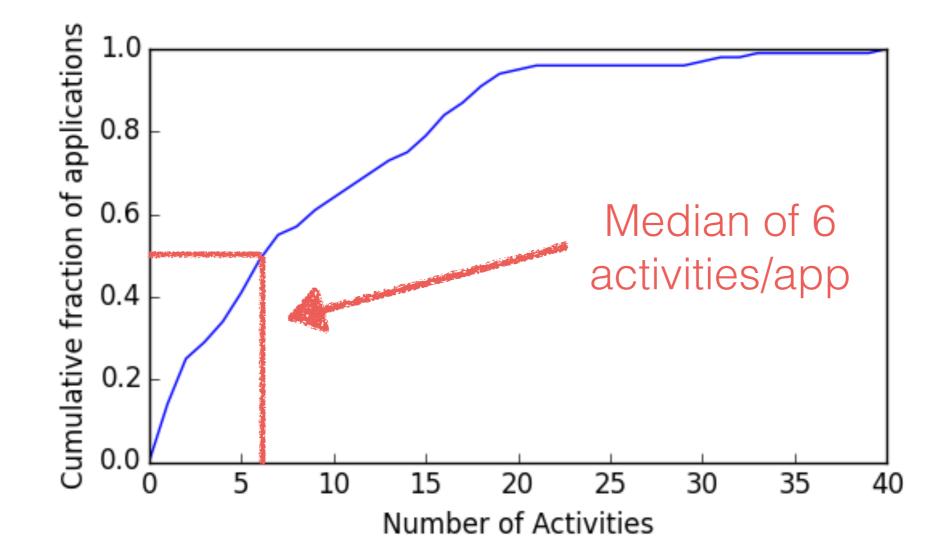
Application Modularity



Application Modularity



Application Modularity

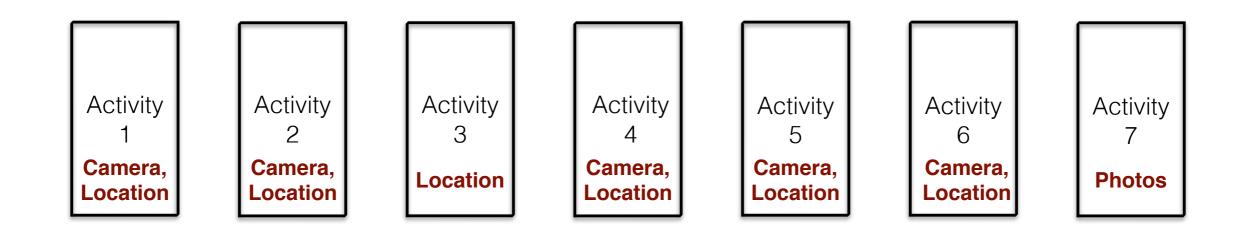


Activities provide meaningful modularity to implement CSAC

Feasibility

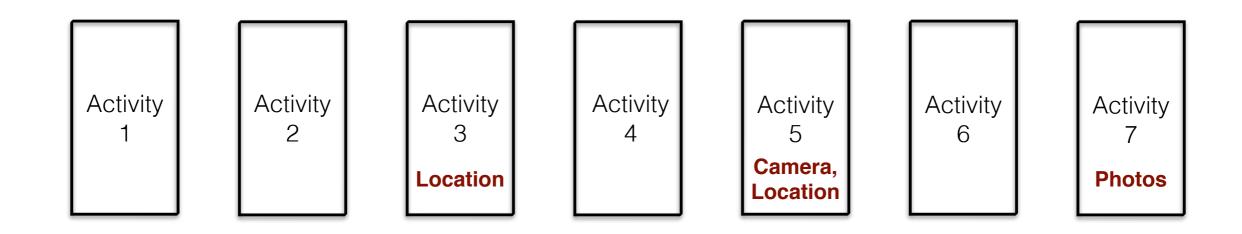
- ✓ Applications should be modular.
- CSAC decision overhead should be low

Permission Usage



11

Permission Usage

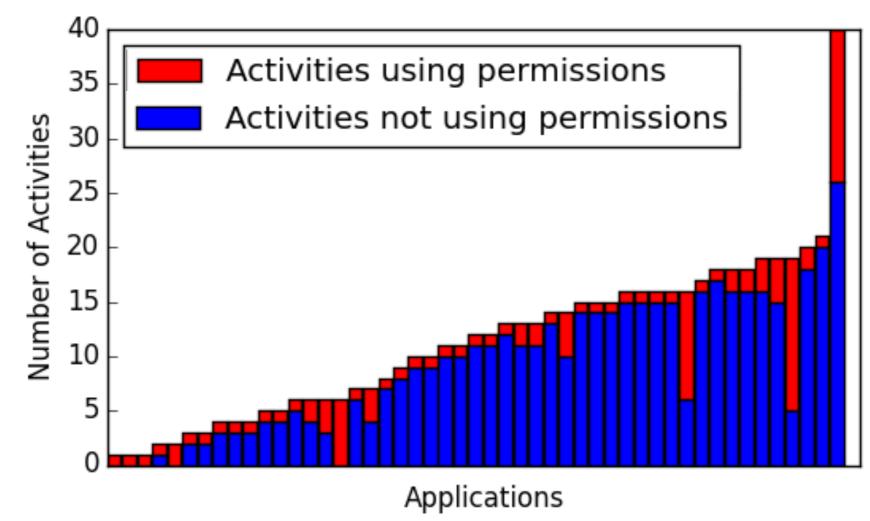


Experimental Setup

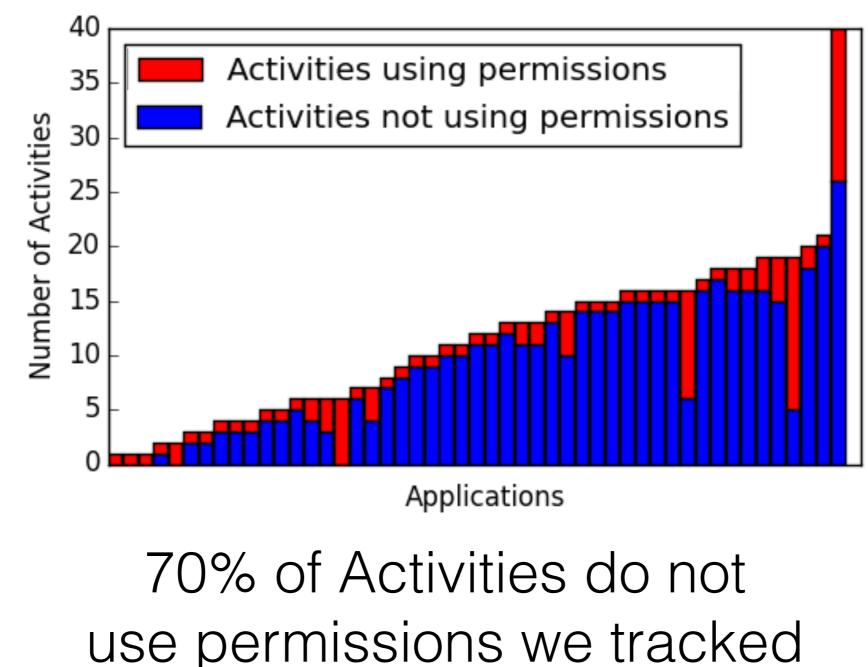
Experimental Setup

- 100 popular free Android applications.
- Dynamic exploration with A3E.
- Tracked use of Camera, Location, Device ID, Bluetooth, and Photos.

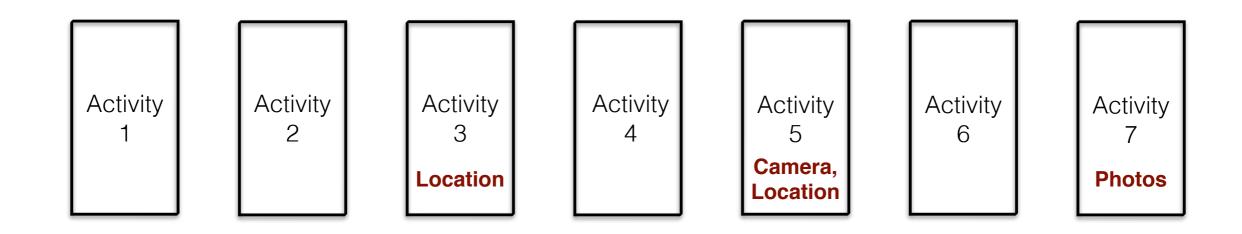
Permission usage variation across Activities



Permission usage variation across Activities

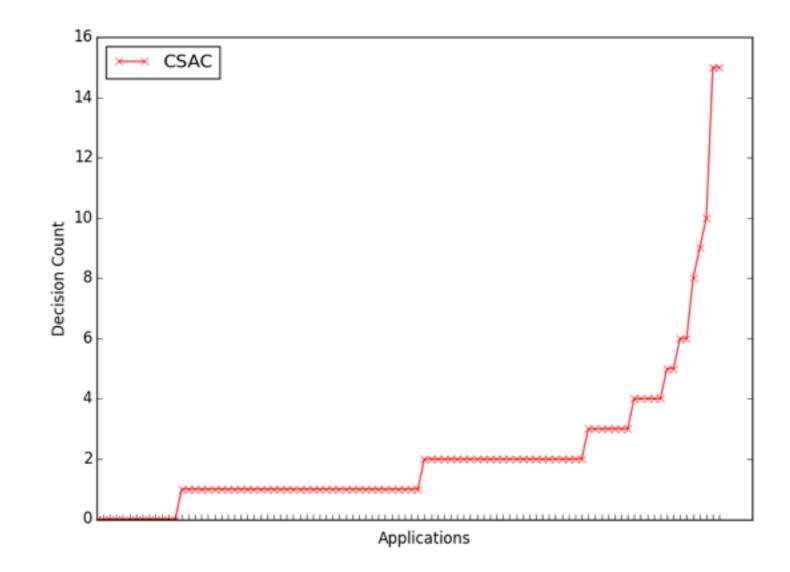


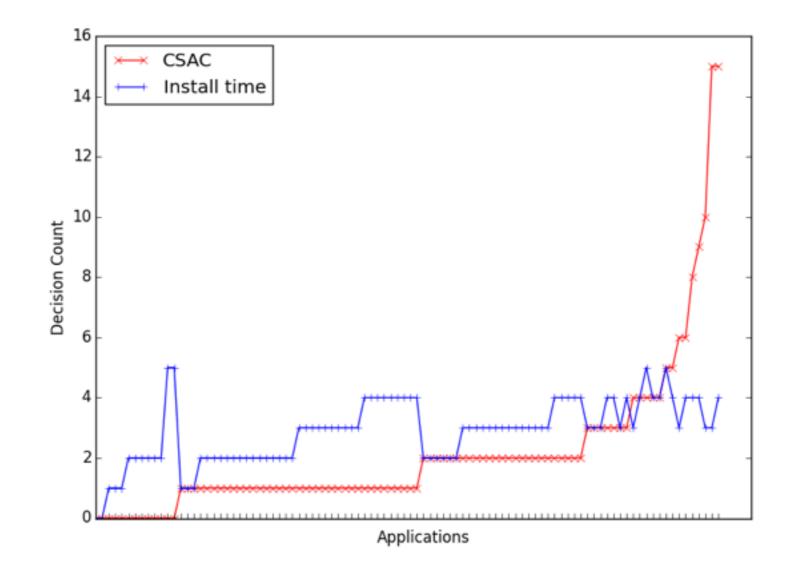
Permission Usage

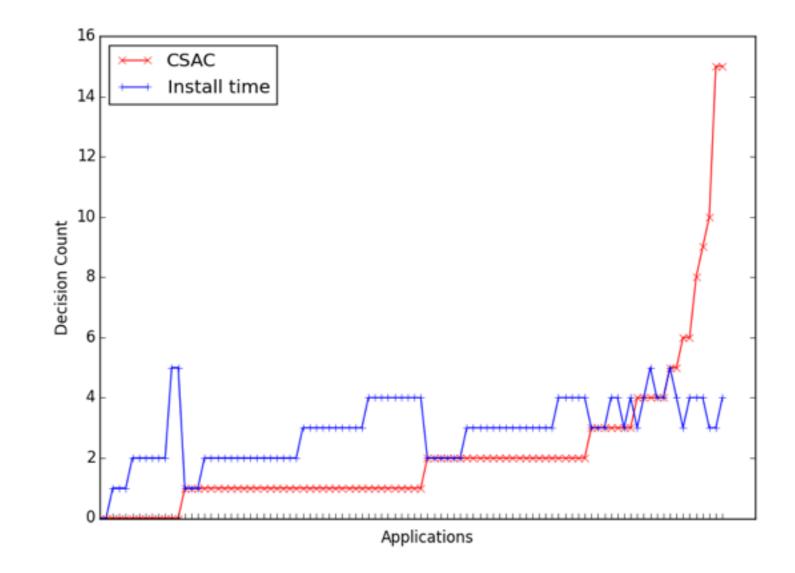


Decision Overhead

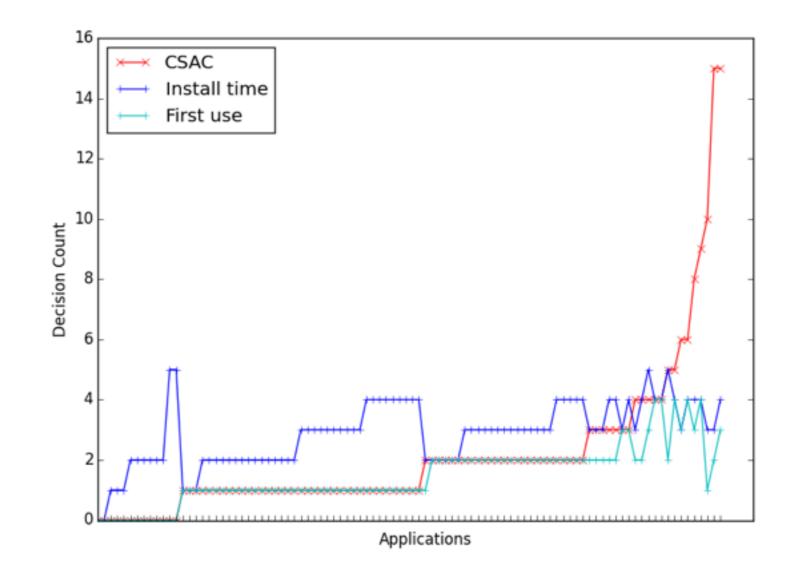
Decision Overhead



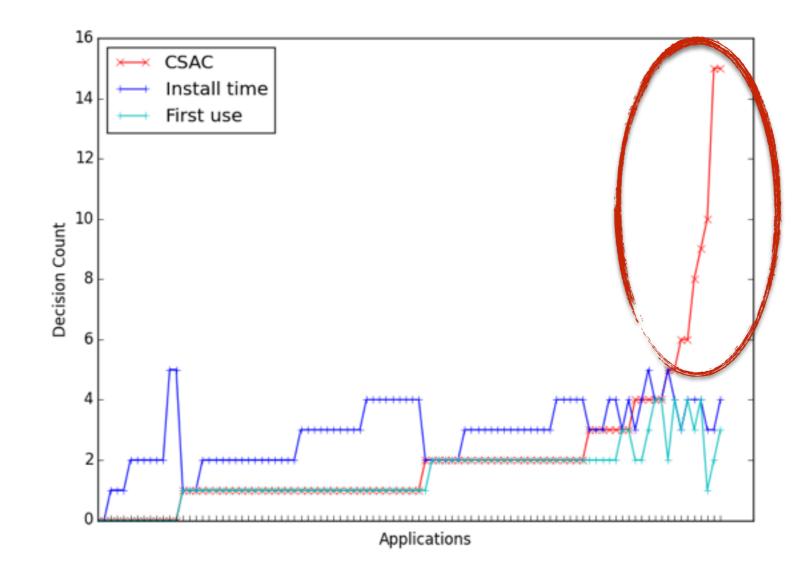




For most of the applications CSAC has no overhead.



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For most of the applications CSAC has no overhead.

	Dynamic Exploration					
Application	Install time	First use	CSAC			
Dictionary	3	2	15			
Flipagram	4	3	8			
GasBuddy	3	1	10			
WeatherBug	3	3	6			
Yelp	4	3	15			

	Decision Count								
	Dynamic Exploration				User Study				
Application	Install time	First use	CSAC	Union	User #1	User #2	User #3	User #4	User #5
Dictionary	3	2	15	6	4	4	3	3	4
Flipagram	4	3	8	2	2	1	2	1	1
GasBuddy	3	1	10	5	3	3	3	3	3
WeatherBug	3	3	6	6	3	2	3	2	2
Yelp	4	3	15	5	4	3	3	2	3

	Decision Count								
	Dynamic Exploration				User Study				
Application	Install time	First use	CSAC	Union	User #1	User #2	User #3	User #4	User #5
Dictionary	3	2	15	6	4	4	3	3	4
Flipagram	4	3	8	2	2	1	2	1	1
GasBuddy	3	1	10	5	3	3	3	3	3
WeatherBug	3	3	6	6	3	2	3	2	2
Yelp	4	3	15	5	4	3	3	2	3

Conclusion

Conclusion

- Applications can be broken down to different contexts.
- Different contexts require a different set of permissions.
- CSAC can get us closer to realizing principle of least privilege.
- Many challenges remain:
- -Data sharing
- -Background services
- -Modifying permissions

Backup Slides

Background vs Foreground

"Google Maps" Would Like to Use Your Current Location

Don't Allow	ОК
Don't Allow	OK

"Weather" has been using your location in the background. Do you want to continue allowing this?

Your location is used to show local weather in the "Weather" app and in Notification Center.

Settings	Continue
Settings	Continue

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