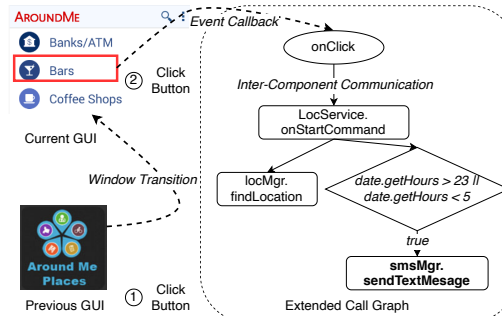


CAREER: Enhancing Mobile Application Security through Contextual Integrity and User Awareness

Problem:

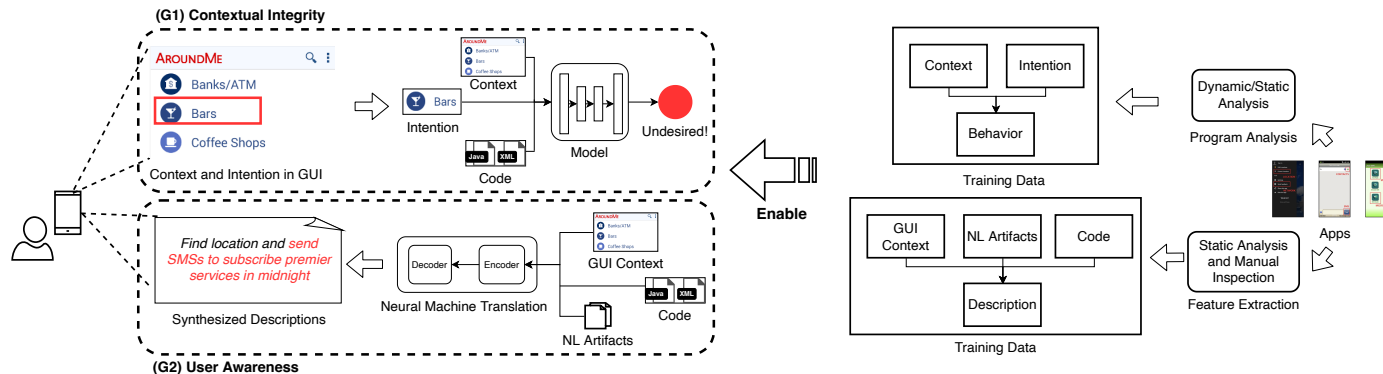
- Smartphone apps access more and more private data
- Permission-based access control is limited
 - Lack of **Contextual Integrity**
 - Lack of **User Awareness**



Example **Potentially Harmful App**

Challenge:

- Modeling Contexts and Intentions for Sensitive Behaviors (GUI states, Environment states)
- Describing Sensitive Behavior (Contexts and vocabularies)



Context and User Aware Security Framework

Solution:

- Context and intention aware undesired behavior detection
- Context aware description synthesis for sensitive behaviors

Scientific Impact:

- Develop innovative links between program analysis and machine learning to fundamentally advance the knowledge of enhancing mobile app security
- Develop novel techniques to associate the contexts and the intentions expressed in GUIs with the behaviors in the code
- Develop novel techniques to synthesize descriptions for sensitive behaviors based on GUI contexts, privacy policies, and code

Broader Impact and Broader Participation:

- Lead to more secure mobile apps
- Improve user awareness of risks in using mobile apps
- Provide new insights for the cooperation of program analysis and machine learning
- Gain better understandings of the fundamental challenges of enabling contextual integrity and user awareness in security systems

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