

Reproducible Interference-aware Mobile Testing

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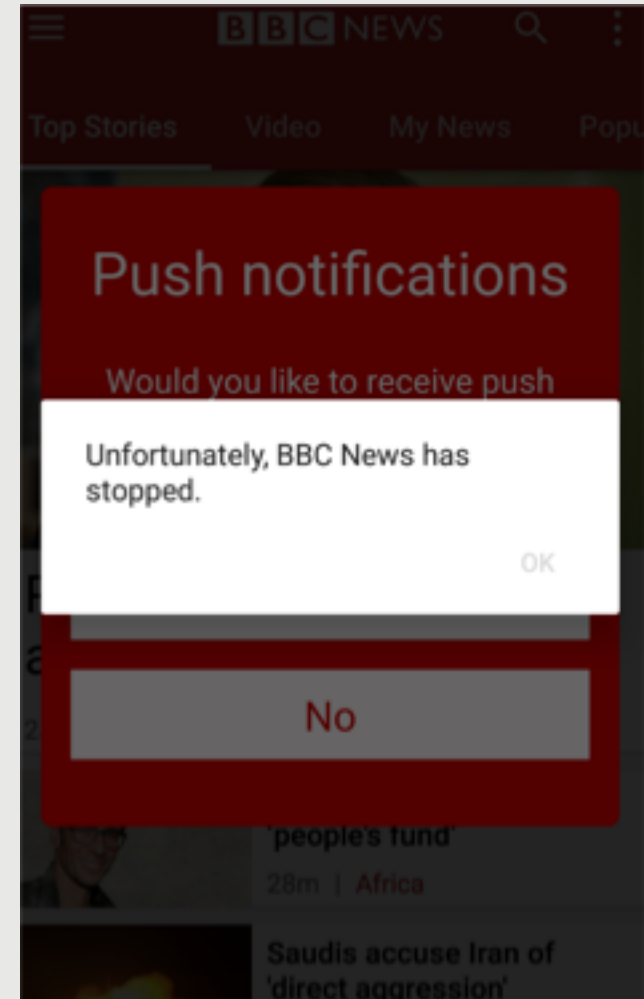
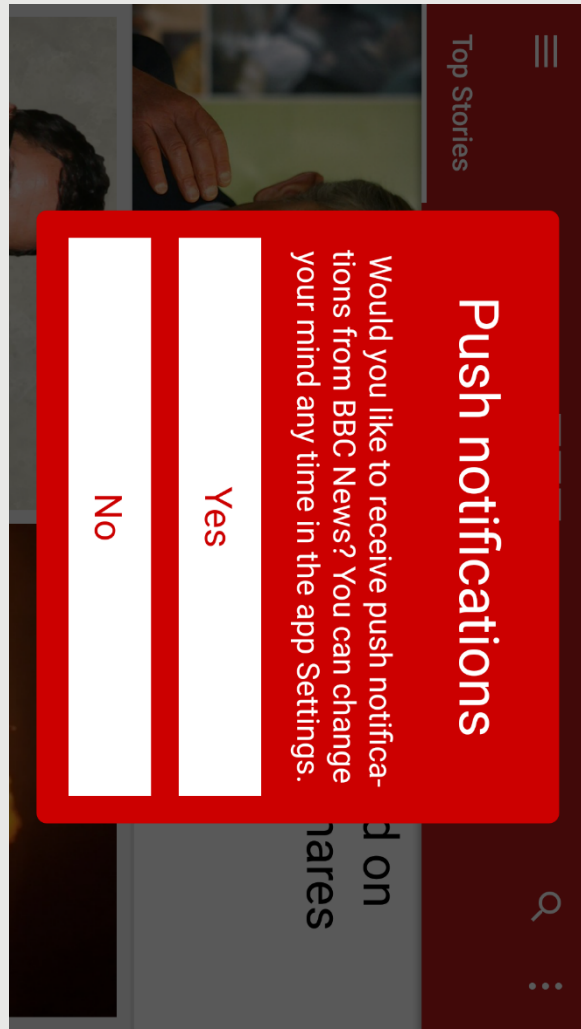
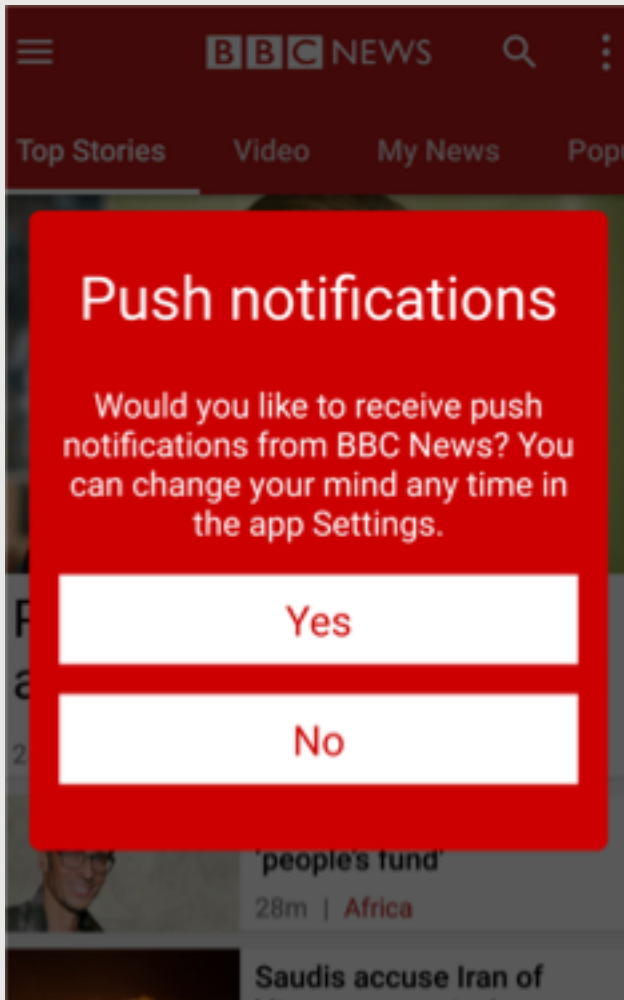


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[^] AppetizerIO

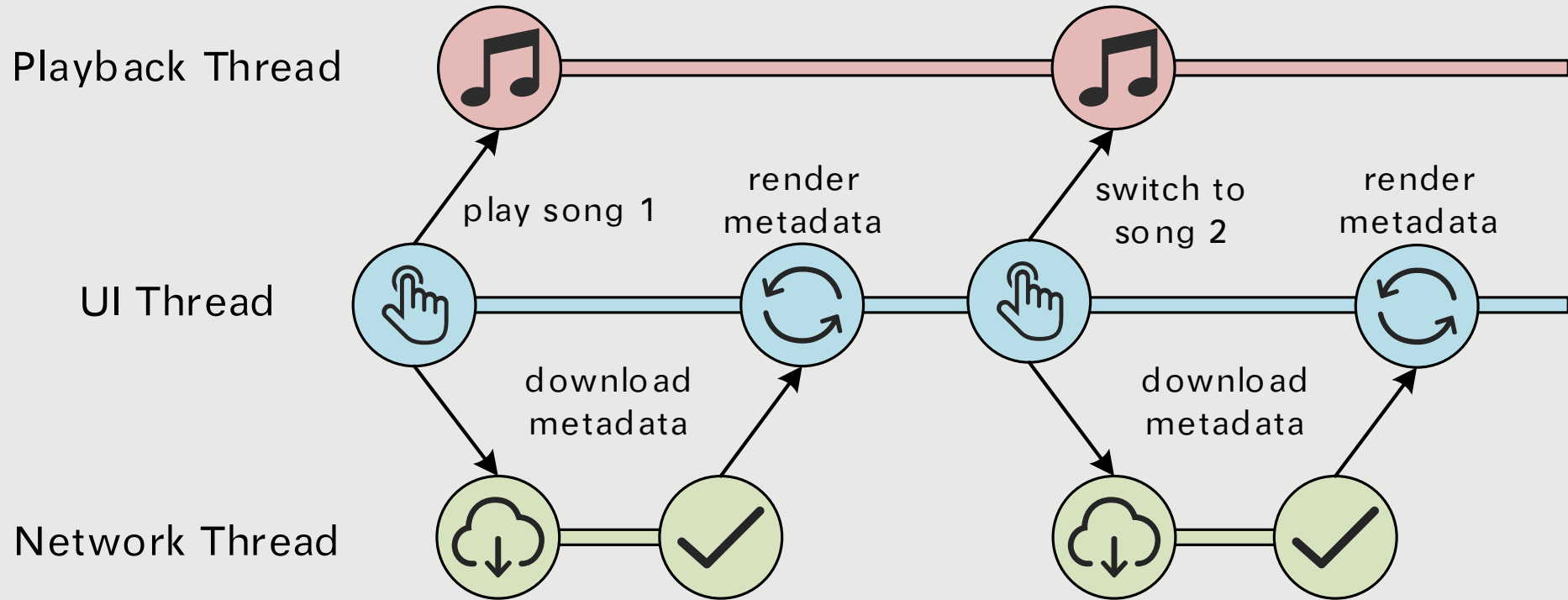
Crash It !



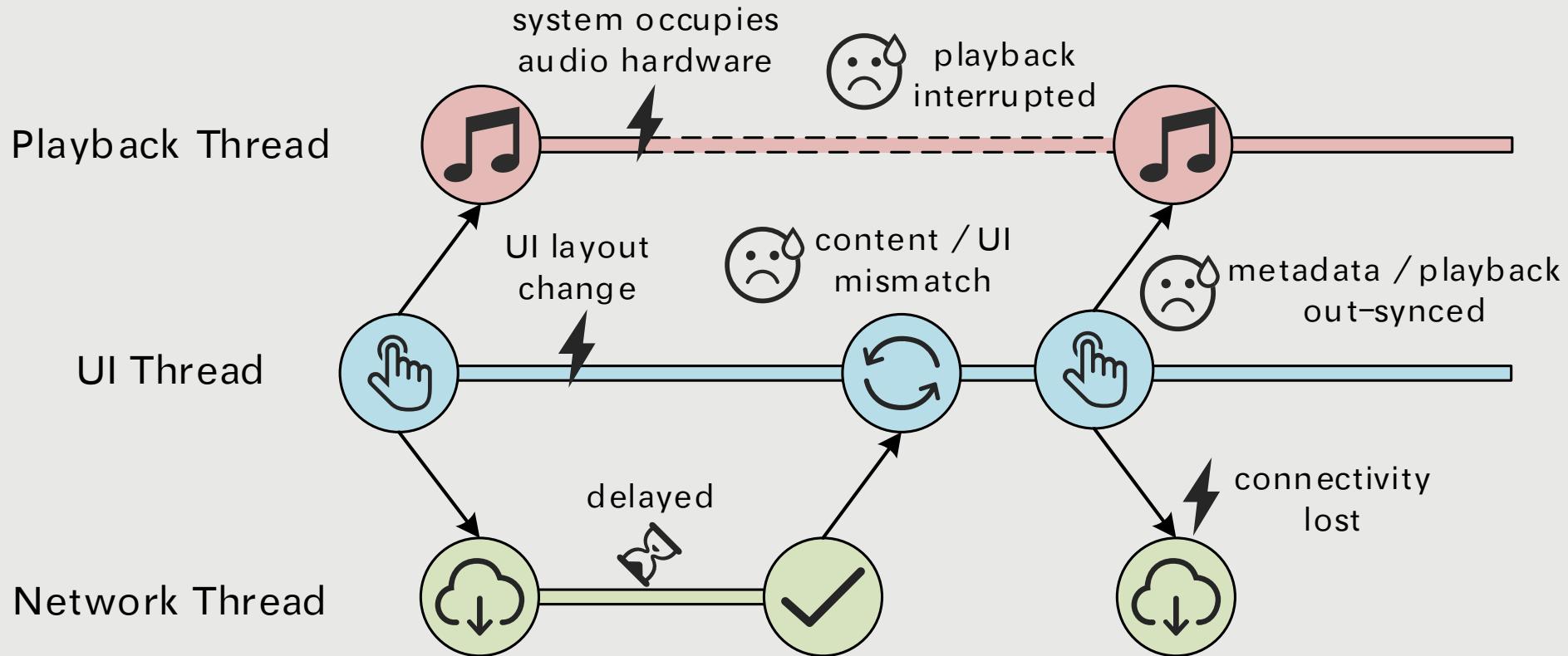




music player from developers' view



music player in reality



Question 1:

What are the *interferences* in the wild ?



alarm event



Wi-Fi switch



4G switch



background audio



permission request



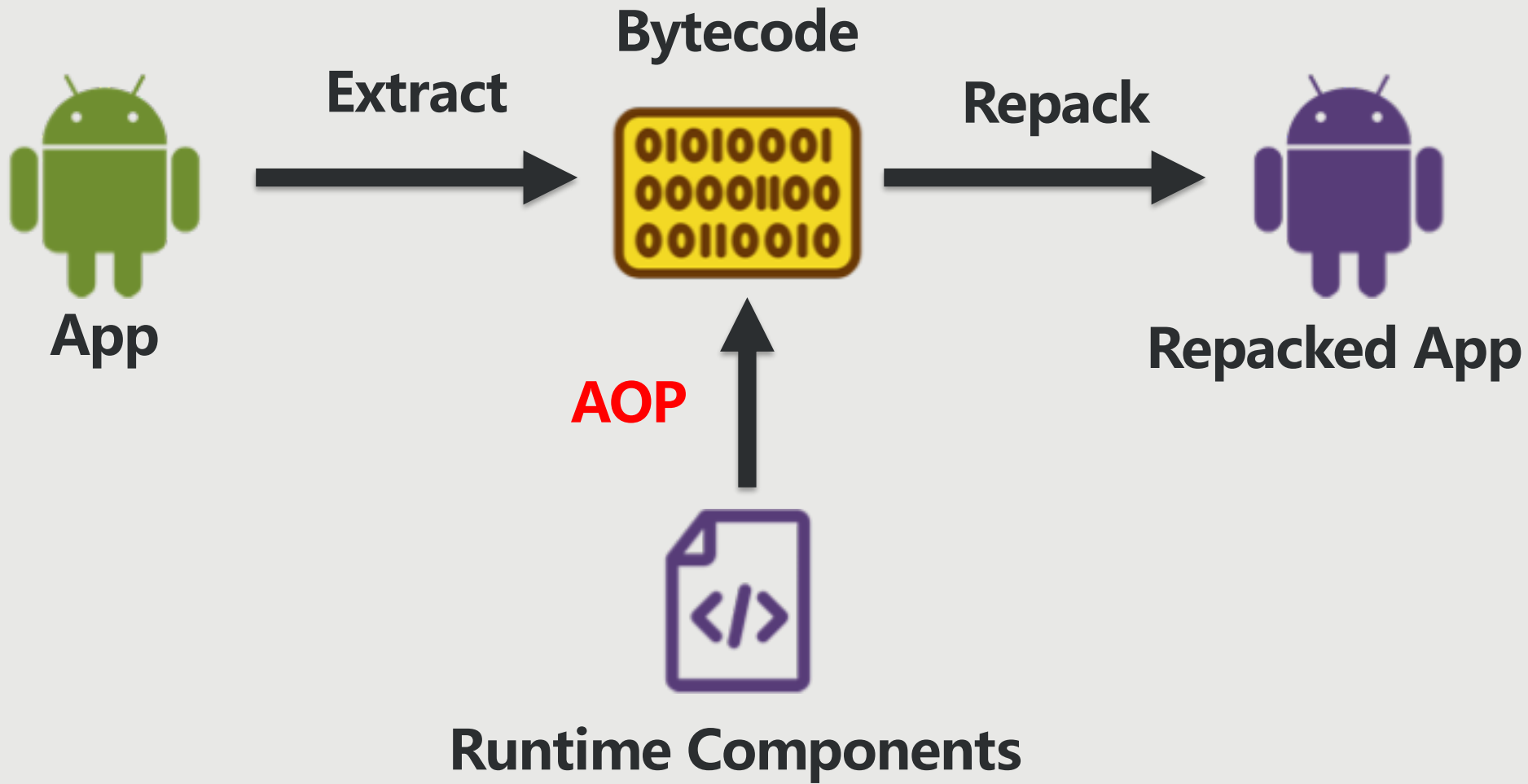
screen rotation



incoming call

Question 2: How to inject interferences practically?

- **real phone, not simulator**
- **real and complicated apps**
- **without source code**



Question 2: How to inject interferences practically?

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Question 3: How to reproduce issues ?

- **record interferences and steps**
- **replay**

JazzDroid

Runtime Components

Interference Collector

UI Mutation Injector

System Broadcast Injector

Computation Slowdown
Injector

Network Issue Injector

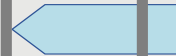
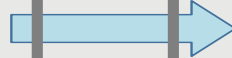
Offline Tools

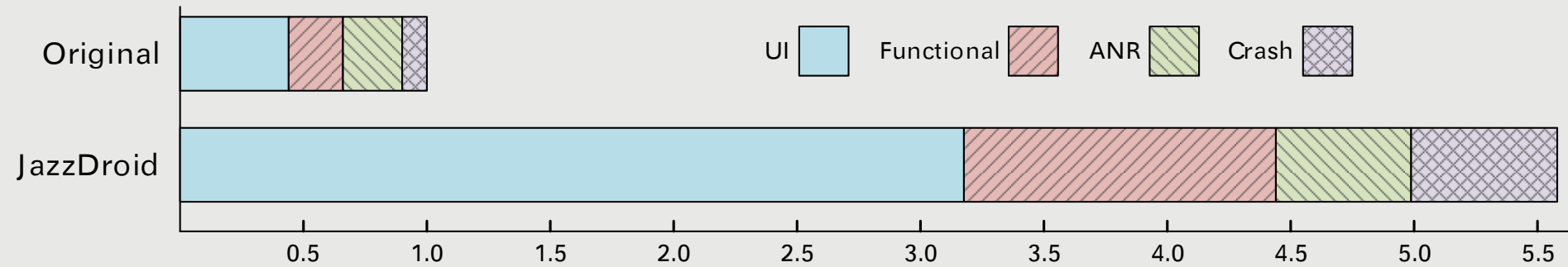
Interference Bookkeeper

Interference Parameters

Parameter Optimizer

Bytecode Instrumenter



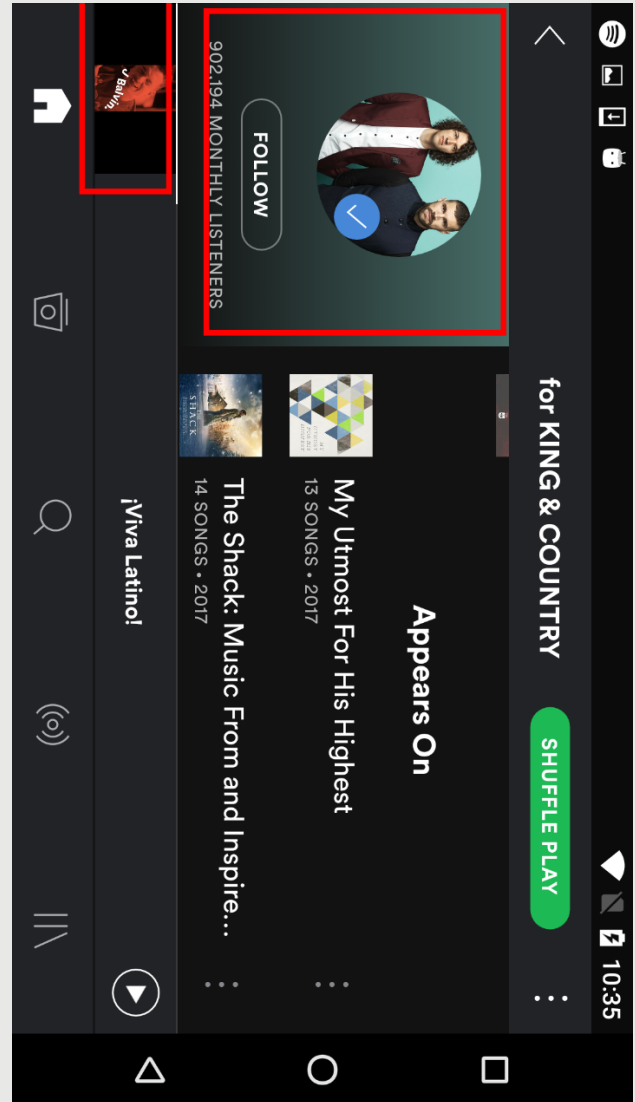
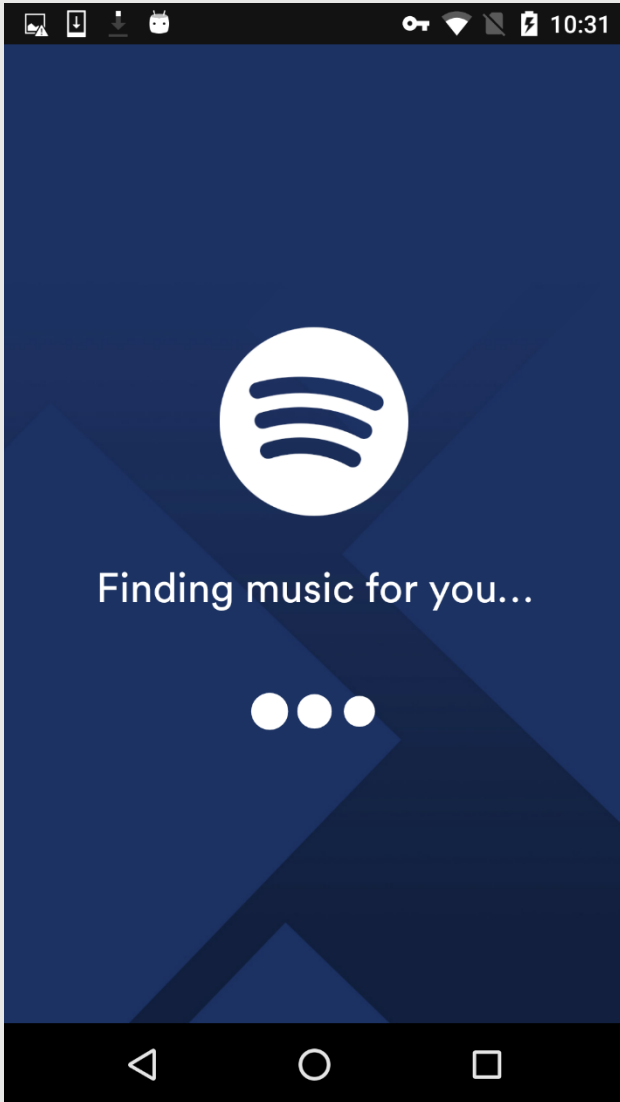


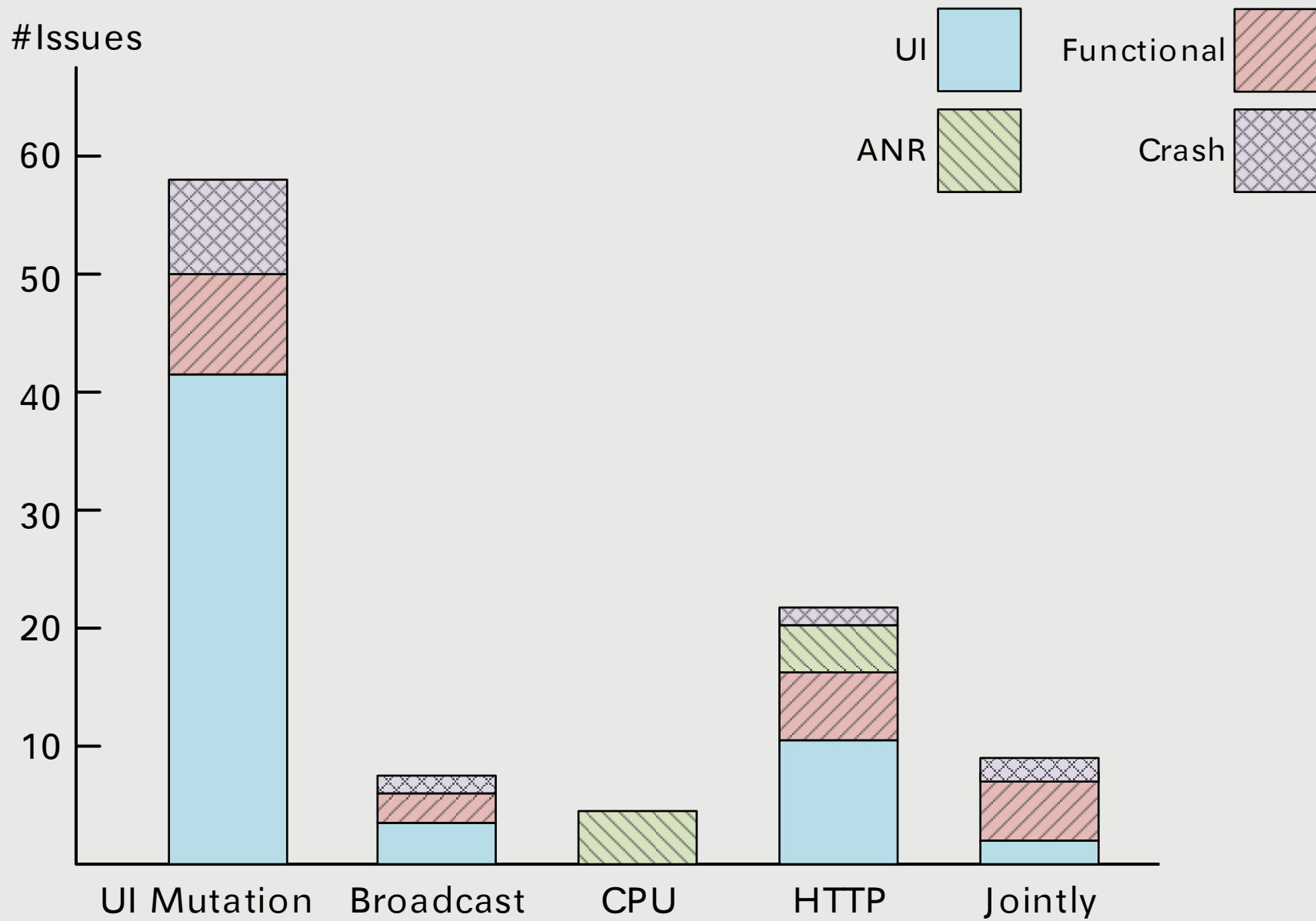
- Manual Testing
- UI Automation Scripts
- Monkey
- 105 real-world apps
- 45 minutes testing time per App

6x



Spotify Music
100+ million
downloads





Interference: Screen Rotation



screen rotation causes UI recreation

common bugs: inconsistent UI / Null Pointer

Interference: Screen Rotation



screen rotation → page re-rendering

common bugs → UI / Null Pointer





Zhihu
Quora in China
67 million downloads

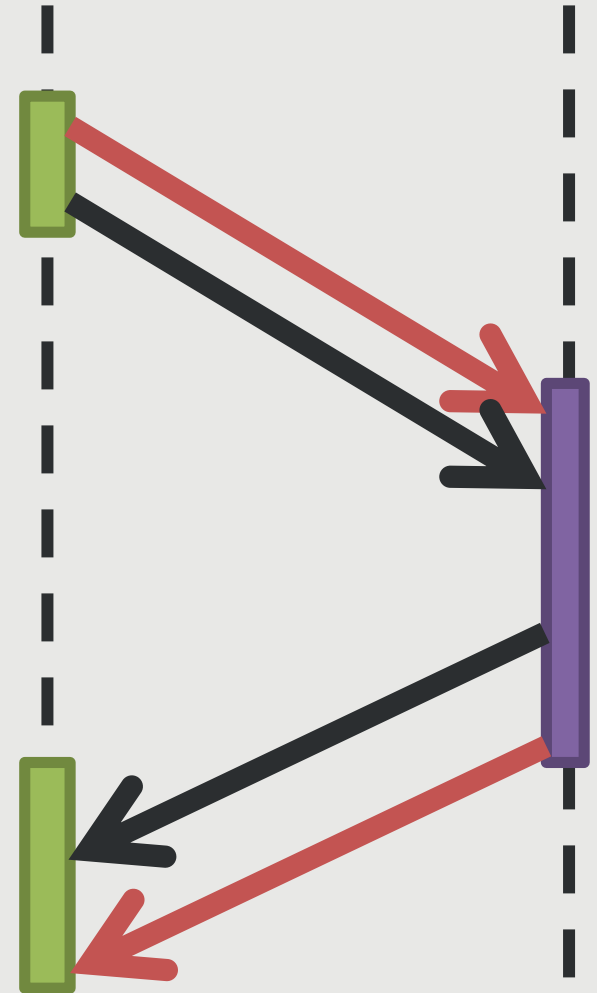
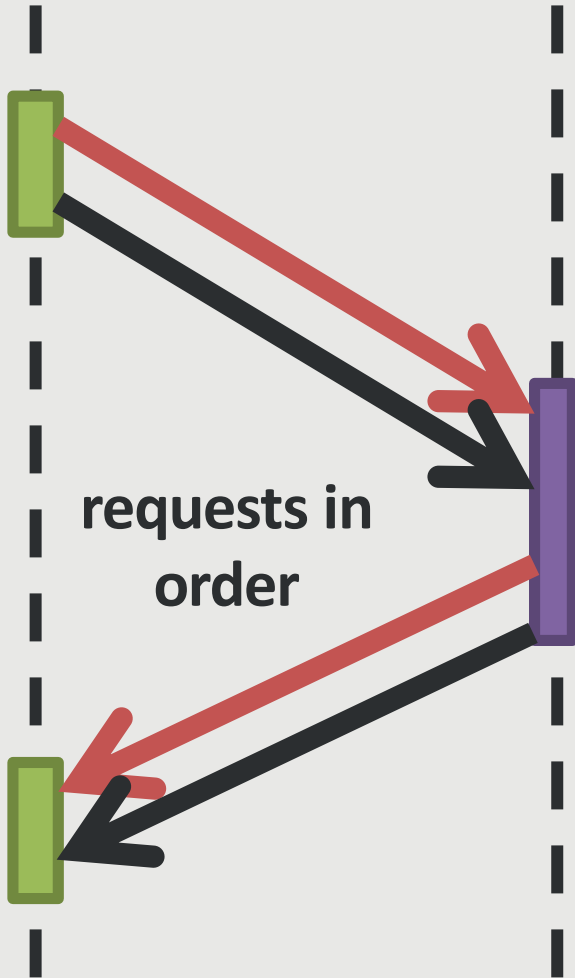


Interference: System broadcast and permission request

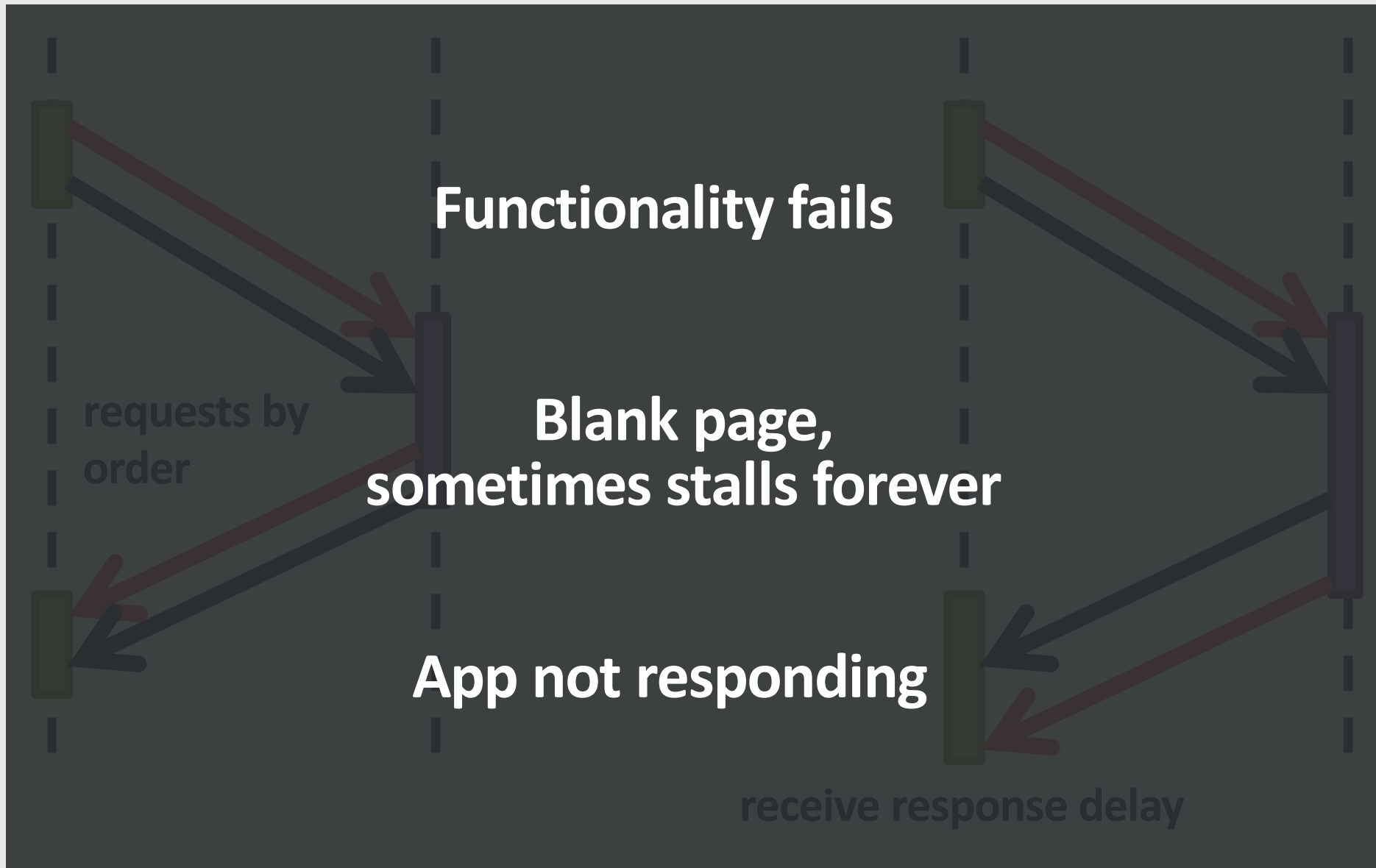
state corrupted



Interference: Network delay or packet loss

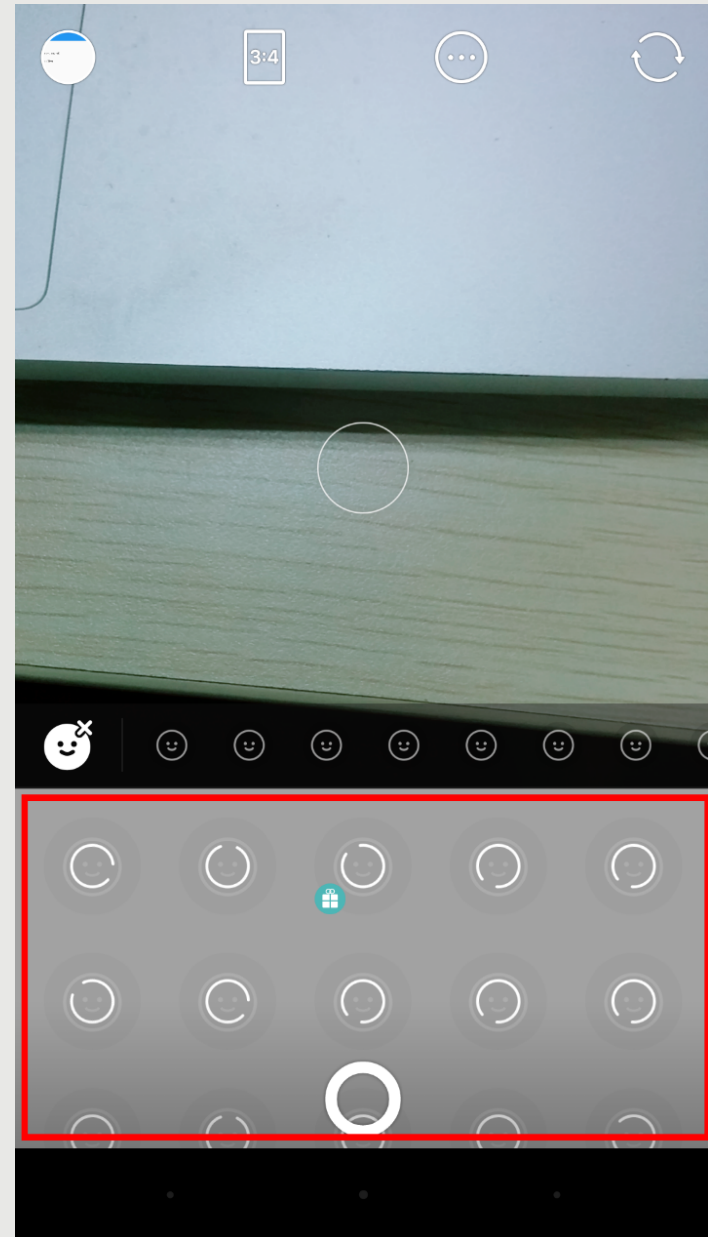


Interference: Network delay or packet loss





B612
Avatar Making App
110 million downloads





100+ well-tested Apps



6x new issues

Q & A