Automated Support for Mobile Application Testing and Maintenance

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**Research Outline**

- **Test Generation**
  - Manual Testing
  - Practice: 52%
  - Challenges: 48%
  - Not enough time to test
  - Do not have the right testing process/method
  - Do not have the right tools to test

- **GUI Inconsistency Identification**
  - Test cases successfully encoded and executed: 46%
  - User efficiency in generating test cases: 32%

- **Bug Report Analysis**
  - Translated Bug Report: 65%
  - Cost of running YakuSu: few minutes to process a bug report

**Research Directions**

- **Testing**
  - Fuzzing based on recorded tests

- **Maintenance**
  - Enhanced test-based bug reporting
  - Automatically fixing inconsistencies

**Mobile Applications**

**GUI Inconsistency Identification**

**Work In Progress**

- **APPEvolve**
  - API Usages Successfully Updated: 85%
  - Cost of running APPEvolve: runs overnight

- **App Evolution**
  - Android Version: 22
  - Marshmallow: Android 6

**Research Goals**

- Find more bugs early with novel testing techniques
- Effectively resolve bugs with novel maintenance techniques

**GUI Inconsistency Identification**

- **YakuSu**
  - GUI Inconsistency Identification

- **DiffDroid**
  - API Inconsistency Identification

**Work In Progress**

- **API Usages**
  - Enhanced Bug Reporting
  - API Inconsistency Identification

**Testing and Maintenance**

- **Bugs**
  - Test Case Execution
  - Test Case Recording
  - Recorded Test

- **Test Generation**
  - BARISTA
  - Test Case Encoding
  - Test Case Generation

**AppEvolve**

- API Usages Analysis
- API Usages Update
- Update Example Analysis
- Update Example Search

**GUI Inconsistency Identification**

- LG G3
- LG Optimus L70

**Work In Progress**

- **LoFloR**
  - Version: 22
  - Android: Marshmallow: Android 6