Iterative Android Automated Testing

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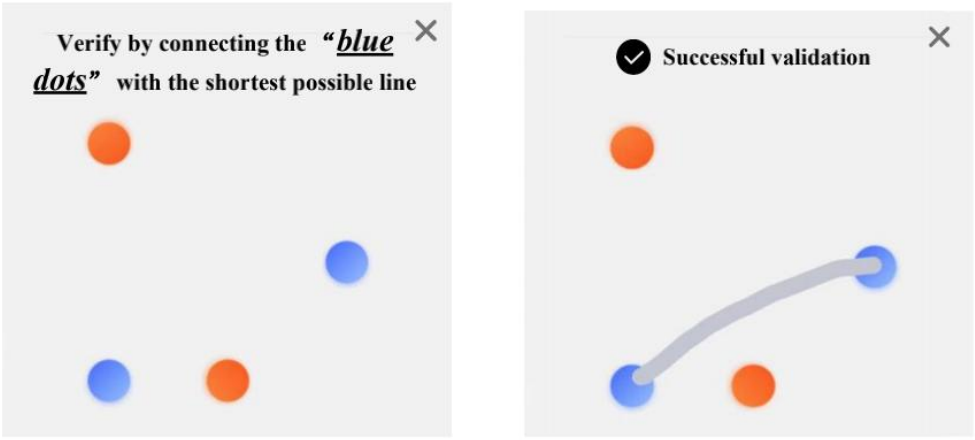
Problems & Ideas

- Problems of conventional stereo matching approaches:
  - Compared with automated testing, manual testing can achieve higher coverage in complex interactive Activities.
  - the effectiveness of manual testing is highly dependent on the User Operation Process (UOP) of experienced testers.
- Ideas: A method that automatically records, extracts, and integrates UOPs to guide the test logic of the tool across the complex Activity iteratively.

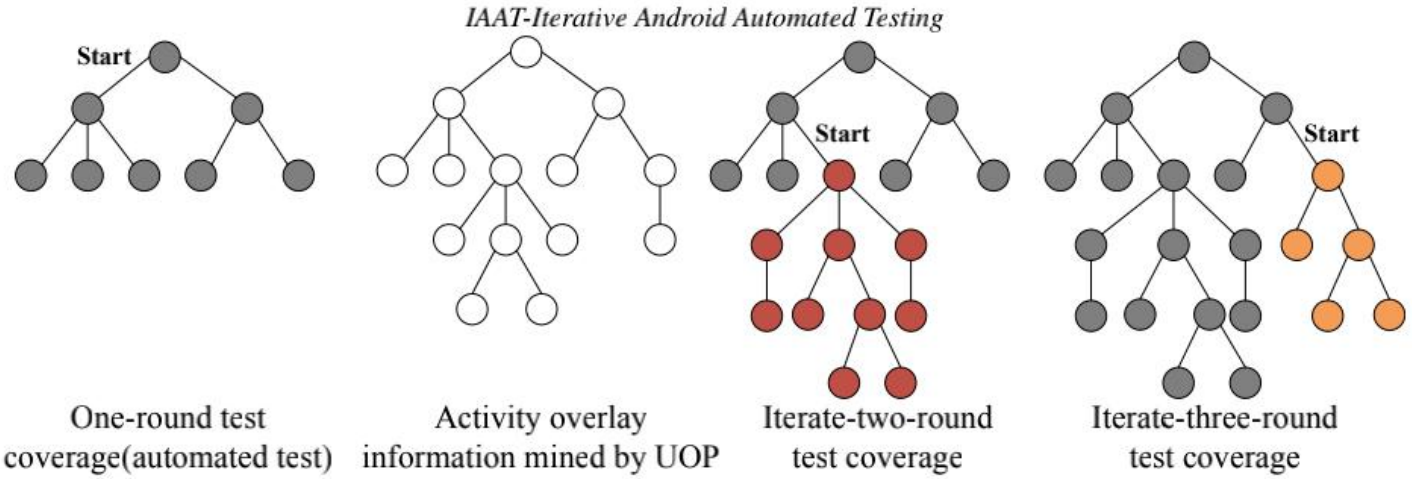


(a) Request verification (b) Verification success

Verification example. (a) is a validation screen requiring the shortestpath to the specified colour area, and (b) is a successful validation screen.

Main Contributions

- Contributions:
  - Construct UOPs with human knowledge in a specif┐ ic format of User Operation Process information, aim┐ ing to assist and guide automated testing through more deep and complex exploration;
  - We innovatively propose a human-machine interaction method to complement manual and automated testing. It can achieve both depth and breadth of testing;
  - A comprehensive experiment has shown that the effectiveness is significantly improved compared with Monkey and Simple traversal test.



Activity overlay tree information during automated test tool running. Tree 1 is the Activity overlay tree obtained through automated tests; tree 2 is the Activity overlay tree with human knowledge; tree 3 and tree 4 are the Activity overlay tree after iterating through automated tests guided by UOP information.