

Image Understanding of GUI Widgets for Test Reuse

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Aim

To develop a machine learning model that studies the images and graphical representations of GUI widgets and match similar representations with the intention of test reuse

Abstract

GUI testing is a necessary but pricey task. Interesting findings came from recent study on test reuse strategies for Android applications. Methods for test reuse move human-designed GUI tests from a source app to a target app that has similar capabilities automatically. They do this by taking advantage of the semantic similarity between the textual data in the GUI widgets. We propose a new ML model to extract features based on the images of the GUI widgets. Using graphical representations of GUI widgets instead of textual data in them enables the model to be used independently of language boundaries.

Objectives

- To find similarities between images of GUI widgets
- To find similarities between GUI events
- To find possible opportunities for test reuse

Requirements

A well labeled dataset consisting of screenshots of GUI events performed on mobile screen in different apps with information on where reusability of tests is possible.

Novelty

This work relies on finding similarities between GUI events based on the images and graphical representations of GUI widgets

Methodology

We will build our model using convolutional neural networks(CNNs) and long short term memory(LSTM) layers.

Base Paper

Mariani, L., Mohebbi, A., Pezzè, M., & Terragni, V. (2021, July). Semantic matching of gui events for test reuse: are we there yet?. In Proceedings of the 30th ACM SIGSOFT International Symposium on Software Testing and Analysis (pp. 177-190).