TESTING CONTEXT-AWARE SOFTWARE SYSTEMS: UNCHAIN THE CONTEXT, SET IT FREE!

This briefing reports scientific evidence on Testing Context-Aware Software Systems.

Background

- Context-awareness software systems (CASS) are pervasive;
- There is a lack of software quality technologies considering the variation of context in CASS
- Context-variation is an intrinsic property of a CASS

Method

- By reflecting on current approaches identified by two *quasi*-systematic literature reviews (see sidebar). To discuss current approaches and limitation for testing CASS.

Findings

Restrictions of current technologies for testing CASS!

- **Impose artificial constrains to context.**
- **Context variation is an intrinsic phenomenon of CASS.**

Therefore,

- **Current approaches cannot possibly account for all context variables values.**
- **They limit test space coverage of a test suite for CASS.**

Proposed solution

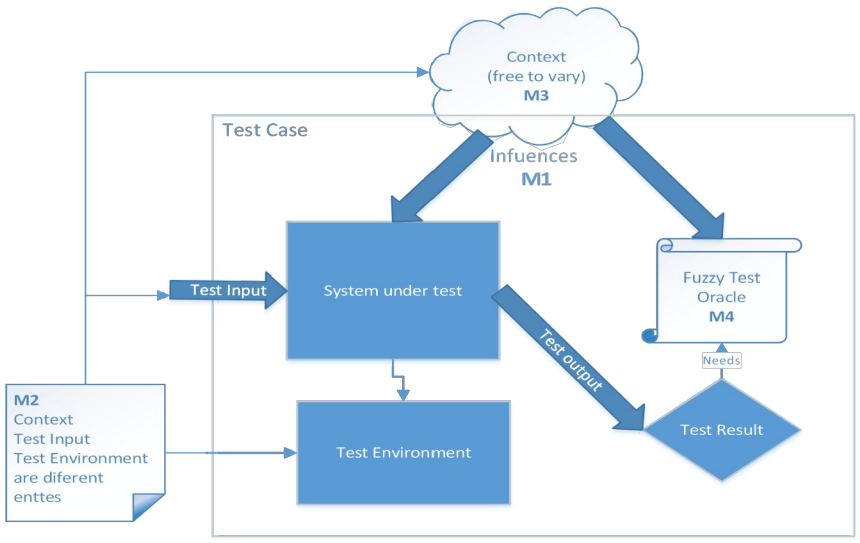
To test CASS without imposing artificial context constrains!

Practical contributions

P1. Assure functional correctness *before* turning to testing context aware requirements.
P2. Design test cases to target context variables.
P3. Take advantage of automatic testing tools as much as possible.

Methodological motivations

M1. Context influences the test case
M2. The application context, the test input, and the test environment are different entities and should also be distinguished during testing.
M3. Context must be left free to change during the test case execution
M4. Fuzzy test oracles must evolve to account for **M1**, **M2**, and **M3**.



Who is this briefing for?

Software engineering practitioners who need to test context-aware software systems.

Where the findings come from?

All findings of this briefing are evidence based and have been extracted from two *quasi*-systematic literature reviews:

1. Matalonga, S., Rodrigues, F., Travassos, G.H.: Characterizing testing methods for context-aware software systems: Results from a quasi-systematic literature review. J. Syst. Softw. 131, 1–21 (2017).
2. Santos, I. de S., Andrade, R.M. de C., Rocha, L.S., Matalonga, S., de Oliveira, K.M., Travassos, G.H.: Test case design for context-aware applications: Are we there yet? Inf. Softw. Technol. 88, 1–16 (2017).

What is included in this briefing?

Abstractions and discussions as to current alternatives for testing CASS.
Discussion of limitations of current approaches.

What is not included in this briefing?

Details of the *quasi*-systematic literature reviews.

For additional information about Testing CASS:

CAcTUS Project (CNPq 484380/2013-3)
http://lens-ese.cos.ufrj.br/ese/?portfolio=projeto-cactus