Strategies for Prioritizing Test Cases Generated Through Model-Based Testing Approaches

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1. To compare five existing prioritization techniques, using two application models, concerning to their ability of revealing failures, varying the number of test cases that fail.

**ART_Jac** | Random **ART_Man**

- **ART_Jac** presented the best performance;
- Techniques evolve differently, varying the number of failures;
- Thus, other factors may impact the techniques.

2. To evaluate the influence of the model structure, with respect to the ability of revealing failures of existing prioritization techniques.

Null hypotheses of equality among the samples could not be rejected → Statistical irrelevance of the model structure!

3. To evaluate the influence of the failure profiles, with respect to the ability of revealing failures of existing prioritization techniques.

Every null hypotheses of equality among the samples were rejected → Statistical relevance of the failure profiles!

**Proposed Technique - Characteristics**

- An adaptation of Adaptive Random technique
- Instead of random choice, use hints based on expertise
- Explore test cases “near” of the hint related test cases
- Hints are expressed as a Test Purpose

For example, if a query about users is noticeably hard to implement, thus a hint could expressed as:

* | perform query on user table | *

**Proposed Technique - Algorithm**

**Inputs:**
- Test Suite TS
- Team hint H

**Similarity** (Cartaxo et al. 2007)

- Calculate likeness of test cases from TS

Random choice, among the ones related to the hint

- Select the first test case from TS, based on H
- Put t in prioritized sequence PTS

Maximum similarity between candidates and already prioritized

- Generate the set of candidates cand
- Select the next test case from cand
- Put t in prioritized sequence PTS

**Explanatory Study**

- Four synthetic models;
- Seeded failures with different characteristics;
- Proper hints assigning failures;
- Versus random prioritization.

- ART_Hint showed more consistence when longer test cases fail;
- With shorter failures, the similarity function tends to select other test cases not related with the hint.

Similarity function should consider the likeness with the hint directly!!

**Future Steps**

1. Experiment about the effect of giving a hint (ongoing)
2. Investigate a new function to represent likeness between test cases
3. Propose a different way of selecting test cases related to the hint and composing the candidate set
4. Case study involving our evolved technique and other techniques suggested in the literature

1*Ouriques et al. 2013

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