Weekly report

Xin Zhang

University of South Carolina

September 2, 2019

Contents

Brief Introduction

Alessio Gambi,focus on Software Testing, Testing Self-Driving Cars, Cloud computing.
2019:

- FSE19' Generating Effective Test Cases for Self-Driving Cars from Police Reports

- ICSE19' AsFault: Testing Self-driving car software using search-based procedural content generation

- ISSTA19' Automatically Testing Self-Driving Cars with Search-Based Procedural Content Generation (the former version of FSE19')

Brief Introduction

Generating effective test cases for self-driving cars from police reports
A Gambi, T Huynh, G Fraser
Proceedings of the 2019 27th ACM Joint Meeting on European Software ...
2019

Automatically testing self-driving cars with search-based procedural content generation
A Gambi, M Mueller, G Fraser
Proceedings of the 28th ACM SIGSOFT International Symposium on Software ...
2019

Automatically reconstructing car crashes from police reports for testing self-driving cars
A Gambi, T Huynh, G Fraser
Proceedings of the 41st International Conference on Software Engineering ...
2019

AsFault: testing self-driving car software using search-based procedural content generation
A Gambi, M Müller, G Fraser
Proceedings of the 41st International Conference on Software Engineering ...
1   2019

AC3R: automatically reconstructing car crashes from police reports
T Huynh, A Gambi, G Fraser
Proceedings of the 41st International Conference on Software Engineering ...
1   2019

Gamifying a Software Testing Course with Code Defenders
G Fraser, A Gambi, M Kreis, JM Rojas
Proceedings of the 50th ACM Technical Symposium on Computer Science ...
2019

A preliminary report on gamifying a software testing course with the Code Defenders testing game
G Fraser, A Gambi, JM Rojas
Proceedings of the 3rd European Conference of Software Engineering Education ...
3   2018

Practical test dependency detection
A Gambi, J Bell, A Zeller
2018 IEEE 11th International Conference on Software Testing, Verification ...
13   2018

CUT: automatic unit testing in the cloud
A Gambi, S Kappler, J Lampel, A Zeller
Proceedings of the 26th ACM SIGSOFT International Symposium on Software ...
11   2017

Generating unit tests with structured system interactions
N Havrikov, A Gambi, A Zeller, A Arcuri, JP Galeotti
2017 IEEE/ACM 12th International Workshop on Automation of Software Testing ...
2   2017

Model-based testing of end-user collaboration intensive systems
A Gambi, C Mayr-Dorn, A Zeller
Proceedings of the Symposium on Applied Computing, 1213-1218
2017

OI snap: Cost-efficient testing in the cloud
A Gambi, A Gorla, A Zeller
2017 IEEE International Conference on Software Testing, Verification and ...
6   2017

Control

Use APIs(more Python, C++) to control:

1. Control the movement (each action less than 5 lines code)
   - Front, rear, left and right
   - Brake
2. Monitor the camera
   - Five camera available (front-left, front-right, front, rear, driver);
   - Thumbnails and uncompressed images

Build your own environment

Can NOT use codes to modify the test environment!

Only build models!

Three-party models is allowed, but NOT enough for testing auto-car!

- https://www.youtube.com/watch?v=y09VbdQWvQY

1. GOOD:
   - Open-Source, C++
   - Real physical environment, including the position of sun(time), tree, gravity system, wind......
   - Test AI system
   - Support the simulation of drone.
2. BAD:
   - Very expensive to generate test environment (compared with BeamNG).

The AI system is programmed in the chip. Consider the message exchange:

- Sensor.
- AI systems require experts' help to make decision.

Get more information about Auto-vehicle's architecture.

Drone and auto-car

From zhihu.com/question/65252076/answer/230624306

Plan

- Find more about the architecture about Auto-car
  - https://selfdrivingcars.mit.edu/
  - https://www.udacity.com/course/self-driving-car-engineer-nanodegree–nd013
- Learn how to control BeamNG (how to generate random test road)
- Consider how to use black-box test and white-box test together.

Thanks!