

Jueun Park

# Automated Testing of OpenAPI Interfaces Using Attribute Grammars

Bachelor Defense, 25. 11. 2021

# Research Questions

- Grundidee bei der Aufgabenstellung : automated test generation, was kann man mit openapi und rag machen, usw.

# Research Questions

- Grundidee bei der Aufgabenstellung : automated test generation, was kann man mit openapi und rag machen, usw.
- Which approaches and techniques for automated tests of OpenAPI specifications are researched and developed so far?

# Research Questions

- Grundidee bei der Aufgabenstellung : automated test generation, was kann man mit openapi und rag machen, usw.
- Which approaches and techniques for automated tests of OpenAPI specifications are researched and developed so far?
- Are suggested testing approaches from the literatures also available in RAG?

# Research Questions

- Grundidee bei der Aufgabenstellung : automated test generation, was kann man mit openapi und rag machen, usw.
- Which approaches and techniques for automated tests of OpenAPI specifications are researched and developed so far?
- Are suggested testing approaches from the literatures also available in RAG?
- Which advantages can RAG provide with its features at expressing testing approaches?

# Background

# Software Testing

- why do we need software testing?
- classification : box, aims

# REST API

- general infos
- request, response example
- CRUD operations : get, post, put, delete



# OpenAPI Specification

- general infos
- example document
- black box test

# RAG / JastAdd

- general infos
- advantages compared to context-free grammars etc.
- jastadd, pic of process

# Feasibility : Current Approaches

# Specification-based Approach

- general infos
- which inferences?

# Property-based Approach

- general infos
- which inferences?

# Constraint-based Approach

- general infos
- which inferences?

# Operation Dependency Graph Approach

- general infos
- which inferences?

# Stateful REST API Fuzzer

- general infos
- which inferences?



# Summary

- table
- results : fuzzing, type of inferences, etc.

# Feasibility : Implementation

# RAGO

- grammar, ast
- implementation, parser, back-transformation

# Validation

- validation process : empty values are excluded, etc..
- 974 APIs from apis.guru are tested

# Benefits / Future Work

# Benefits

- type of parameter inference
- parameter inference : over 300 acceptable URLs for pet store are generated
- benefits at implementing references, etc.

# Future Work

- Analyses which are already exist
- Extensions which are already exist might facilitate to implement other fuzzing methods like model-based approach
- openapi structure in rag might be useful

# Conclusion