

TSDETECT

An Open Source Test Smells Detection Tool

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TEST SMELLS

Test code, like production code, is **subject to smells**

Formally **introduced in 2001** with 11 smell types

Inclusion of **additional smell types**, analysis of their **evolution** and **longevity**, and **elimination** patterns

Tools to detect specific smell types

Studies on **traditional Java** applications

EXISTING TOOLS

- ✔ TestQ by Breugelmans et al. -- visually explore and quantify test smells
- ✔ TeCRevis by Koochakzadeh et al. -- visualization of redundant tests
- ✔ T-Rex by Neukirchen et al. -- violations of TTCN-3
- ✔ TestHound by Greiler et al. -- smells related to test fixtures
- ✔ Reichhart et al. -- detection of test smells in Smalltalk
- ✔ DTDetector by Zang et al. -- detection of dependent tests
- ✔ Bavota et al. -- detect nine types of test smells
- ✔ Palomba et al. -- detecting three types of test smells

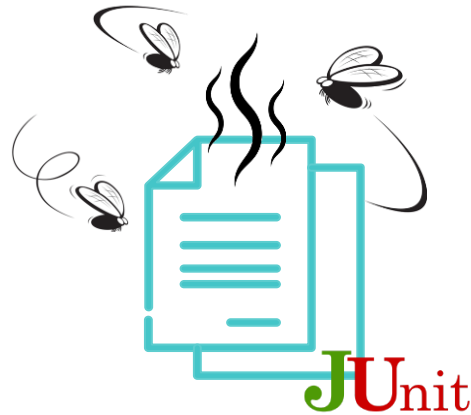
GOAL

The goal of this work is to provide the community with an **open-source, extensible tool** for the detection of multiple types of unit **test smells**

TSDETECT



Open-Source

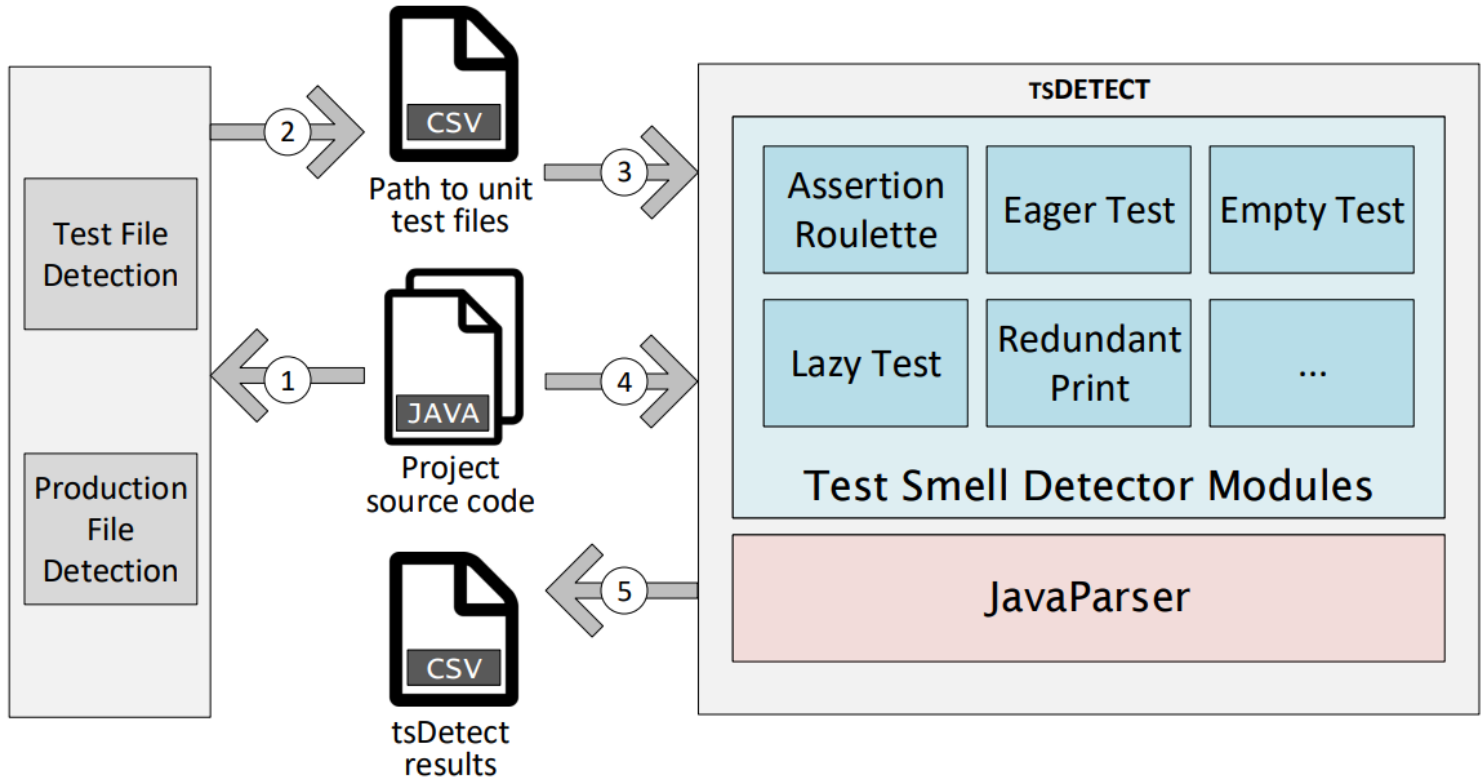


Test Smells Detection



Standalone Executable

ARCHITECTURE



19 DETECTED TEST SMELLS

- ✔ Assertion Roulette
- ✔ Conditional Test Logic
- ✔ Constructor Initialization
- ✔ Default Test
- ✔ Duplicate Assert
- ✔ Eager Test
- ✔ Empty Test
- ✔ Exception Handling
- ✔ General Fixture
- ✔ Ignored Test
- ✔ Lazy Test
- ✔ Magic Number Test
- ✔ Mystery Guest
- ✔ Redundant Print
- ✔ Redundant Assertion
- ✔ Resource Optimism
- ✔ Sensitive Equality
- ✔ Sleepy Test
- ✔ Unknown Test

EVALUATION

- ✔ F-Scores ranging from **87.8% to 100%**
- ✔ Manual Evaluation:
 - ▽ 20 infected instances per smell
 - ▽ 65 annotated files
 - ▽ 39 graduate and undergraduate students

Smell Type	# smell instances	# detected instances	corrected instances	Precision	Recall	F-Score
Assertion Roulette	20	19	18	94.74%	90.00%	92.31%
Conditional Test Logic	20	20	20	100%	100%	100%
Constructor Initialization	20	20	20	100%	100%	100%
Default Test	20	20	20	100%	100%	100%
Duplicate Assert	20	21	18	85.71%	90.00%	87.80%
Eager Test	20	20	20	100%	100%	100%
Empty Test	20	20	20	100%	100%	100%
Exception Handling	20	20	20	100%	100%	100%
General Fixture	20	21	20	95.24%	100%	97.56%
Ignored Test	20	20	20	100%	100%	100%
Lazy Test	20	22	20	90.91%	100%	95.24%
Magic Number Test	20	20	20	100%	100%	100%
Mystery Guest	20	20	19	95.00%	95.00%	95.00%
Redundant Print	20	20	20	100%	100%	100%
Redundant Assertion	20	23	20	85.96%	100%	93.02%
Resource Optimism	20	20	20	100%	100%	100%
Sensitive Equality	20	20	18	90.00%	90.00%	90.00%
Sleepy Test	20	18	18	100%	90.00%	94.74%
Unknown Test	20	21	18	85.71%	90.00%	87.80%
Average	–	–	–	96.01%	97.11%	96.50%

APPLICABILITY



Practitioners



Researchers



Educators

THANKS!

<https://testsmells.github.io>

