

FindSmells: Flexible Composition of Bad Smell Detection Strategies

Bruno L. Sousa, Priscila P. Sousa, Eduardo M. Fernandes, Kecia A. M. Ferreira, Mariza A. S. Bigonha



Introduction

- Bad smells are symptoms of problems in the source code or design of software systems.
- **Problem:** Finding bad smell in software is a hard task.

✓ A system may be several bad smell instances.

✓ The perception of developers regarding a bad smell varies from one developer to another.

- Solution: Detection Strategies.
- Some tools don't allow the customization of them.
- By this reason, we propose the FindSmells.



Bad Smell Detection Strategies

- Detection strategy is a formal rule that characterizes a specific bad smell.
- Some tools provide the automatic running of detection strategies.
- **Problem:** They aren't flexible with respect to the customization of clauses, or regarding threshold changing.



Main Features

- Import of Computed Metrics.
- Composition of Detection Strategies.
- Management the Detection Strategies.
- Running the Detection Strategies.
- Result Generation, Visualization and Export.
- Log Visualization.
- Help.

Architecture



Implementation

- Java Programming Languages.
 ✓ JDK 1.7.
 ✓ Java Swing API.
- Persistence Layer
 - ✓ SQLite Database 3.8.11.2 release. ✓ JDBC API.
- XML parser ✓ JDOM API.
- Netbeans IDE 8.0.2 release.

Main Screen

-	FindSmells					
File Manage Strategies Manage Sys	stems Help					
Run Detection Strategy						
Choose a Detection Strategy:	rategy: Data Class					
Choose a System:	No previously imported systems were found.					
	Run					
Import XML File with Metrics						
Name of the System:]				
Selected XML:						
	Select a XML File					
	Clean Selection					
	Import					

Detection Strategies Composition Screen

 FindSmells – × Compose Detection Strategy 					
Name of the Strategy:					
Granularity of Detection Strategy:	🔘 Method	🔘 Package	Class		
Metrics of Method	Metrics of Package	Metrics of Class			
MLOC PAR NBD VG	CA CE NOC NOI RMA RMD RMI	DIT LCOM NORM NSC SIX WMC	NOF NOM NSF NSM		
AND OR () THRESHOLD < > = <= >=					
Detection Strategy					
Clean Backspace			Save		

Results Screen

FindSmells			
Detection Results Result: 14 of 115 classes.			
Code Element	Source	Package	
FileLogger	FileLogger.java	net.wastl.webmail.logger	
ExpireableCache	ExpireableCache.java	net.wastl.webmail.misc	
StreamConnector	StreamConnector.java	net.wastl.webmail.misc	
FileStorage	FileStorage.java	net.wastl.webmail.storage	
XMLResourceBundle	XMLResourceBundle.java	net.wastl.webmail.xml	
ByteStore	ByteStore.java	net.wastl.webmail.misc	
HTTPResponseHeader	HTTPResponseHeader.java	net.wastl.webmail.server.http	
AdminSession	AdminSession.java	net.wastl.webmail.server	
Storage	Storage.java	net.wastl.webmail.server	
URLHandlerTree	URLHandlerTree.java	net.wastl.webmail.server	
WebMailServer	WebMailServer.java	net.wastl.webmail.server	
WebMailSession	WebMailSession.java	net.wastl.webmail.server	
XMLUserData	XMLUserData.java	net.wastl.webmail.xml	
ChallengeHandler	ChallengeHandler.java	(default package)	
		Export Result as a CSV File	

Evaluation

- FindSmells was evaluated on empirical study.
- It was composed 5 dectection strategies:
 - ✓ Data Class.
 - ✓ Feature Envy.
 - ✓ Large Class.
 - ✓ Long Method.
 - ✓ Refused Bequest.
- Each strategies was executed with 12 Java systems from Qualitas.class Corpus.
- The results suggest that FindSmells is able to run correctly the strategies used in the evaluation.

Conclusion

- We presented FindSmells.
- It use XML files as input.
- It allows the user to compose detection strategies and run them.
- It also allows the user to manage detection strategies

Thank you!

CONTACT US

- Bruno L. Sousa
 ✓ bruno.luan.sousa@dcc.ufmg.br
- Priscila P. Souza
 - ✓ priscilasouza@dcc.ufmg.br
- Eduardo M. Fernandes
 ✓ eduardofernandes@dcc.ufmg.br
- Kecia A. M. Ferreira
 ✓ kecia@decom.cefetmg.br
- Mariza A. S. Bigonha √ mariza@dcc.ufmg.br

FINDSMELLS

• The executable is available on:

✓ <u>Programming Language Laboratory</u>

- The tutorial video is available on:
 ✓ <u>Programming Language Laboratory</u>
 ✓ <u>Youtube</u>
- The source code is available on:

 ✓ Programming Language Laboratory
 ✓ Github