

MockDetector: A technique to identify mock objects created in unit tests

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ABSTRACT

Software dependencies are ubiquitous and may pose problems during testing, because creating usable objects from dependencies is often complicated. Developers, therefore, often introduce mock objects to stand in for dependencies during testing. However, to our knowledge, no static analysis framework provides a tool to automatically identify mock objects created in the unit test cases. The lack of mock object detection can decrease the precision of static analyses, as they are unable to separate methods invoked on mock objects from methods invoked on actual objects.

In this paper, we introduce MockDetector, a technique to identify mock objects. It is able to detect common Java mock libraries' APIs that create mock objects, checking whether there is a call to a mock creation site and then a def-use chain reaching the point of use. Implications of understanding which objects are mock objects include helping static analysis tools identify which dependencies' methods are actually tested, versus mock methods being called.

CCS CONCEPTS

• **Computer systems organization** → **Embedded systems**; *Redundancy*; Robotics; • **Networks** → Network reliability.

KEYWORDS

static analysis, mock objects, unit tests

ACM Reference Format:

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1 INTRODUCTION

2 MOTIVATING-EXAMPLE

```
private Node[] createNodes() {
    final Node node1 = createMock(Node.class);
    final Node node2 = createMock(Node.class);
    final Node node3 = createMock(Node.class);
    final Node node4 = createMock(Node.class);
    ...
}

@Test
public void testGetIterator() {
    ...
    final Node[] nodes = createNodes();
    ...
}
```

Listing 1: This example illustrates a transitive call to EasyMock's *CreateMock(java.lang.class)* function from test case *testGetIterator()*.

3 TECHNIQUE

4 EVALUATION

5 CONCLUSION

6 MATH EQUATIONS

You may want to display math equations in three distinct styles: inline, numbered or non-numbered display. Each of the three are discussed in the next sections.

6.1 Inline (In-text) Equations

A formula that appears in the running text is called an inline or in-text formula. It is produced by the **math** environment, which can be invoked with the usual `\begin... \end` construction or with the short form `$...$`. You can use any of the symbols and structures, from α to ω , available in \LaTeX

6.2 Display Equations

A numbered display equation—one set off by vertical space from the text and centered horizontally—is produced by the **equation** environment. An unnumbered display equation is produced by the **displaymath** environment.

Again, in either environment, you can use any of the symbols and structures available in \LaTeX ; this section will just give a couple of examples of display equations in context.

First, consider the equation, shown as an inline equation above:

$$\lim_{n \rightarrow \infty} x = 0 \quad (1)$$

Notice how it is formatted somewhat differently in the `\displaymath` environment. Now, we'll enter an unnumbered equation:

$$\sum_{i=0}^{\infty} x + 1$$

and follow it with another numbered equation:

$$\sum_{i=0}^{\infty} x_i = \int_0^{\pi+2} f \quad (2)$$

just to demonstrate L^AT_EX's able handling of numbering.

7 FIGURES

Your figures should contain a caption which describes the figure to the reader.

Figure captions are placed *below* the figure.

Every figure should also have a figure description unless it is purely decorative. These descriptions convey what's in the image to someone who cannot see it. They are also used by search engine crawlers for indexing images, and when images cannot be loaded.

A figure description must be unformatted plain text less than 2000 characters long (including spaces). **Figure descriptions should not repeat the figure caption their purpose is to capture important information that is not already provided in the caption or the main text of the paper.** For figures that convey important and complex new information, a short text description may not be adequate. More complex alternative descriptions can be placed in an appendix and referenced in a short figure description. For example, provide a data table capturing the information in a bar chart, or a structured list representing a graph. For additional information regarding how best to write figure descriptions and why doing this is so important, please see <https://www.acm.org/publications/taps/describing-figures/>.

7.1 The “Teaser Figure”

A “teaser figure” is an image, or set of images in one figure, that are placed after all author and affiliation information, and before the body of the article, spanning the page. If you wish to have such a figure in your article, place the command immediately before the `\maketitle` command:

```
\begin{teaserfigure}
\includegraphics[width=\textwidth]{sampleteaser}
\caption{figure caption}
\Description{figure description}
\end{teaserfigure}
```

8 CITATIONS AND BIBLIOGRAPHIES

The use of L^AT_EX for the preparation and formatting of one's references is strongly recommended. Authors' names should be complete — use full first names (“Donald E. Knuth”) not initials (“D. E. Knuth”) — and the salient identifying

features of a reference should be included: title, year, volume, number, pages, article DOI, etc.

The bibliography is included in your source document with these two commands, placed just before the `\end{document}` command:

```
\bibliographystyle{ACM-Reference-Format}
\bibliography{bibfile}
```

where “`bibfile`” is the name, without the “.bib” suffix, of the L^AT_EX file.

Citations and references are numbered by default. A small number of ACM publications have citations and references formatted in the “author year” style; for these exceptions, please include this command in the **preamble** (before the command “`\begin{document}`”) of your L^AT_EX source:

```
\citestyle{acmauthoryear}
```

Some examples. A paginated journal article

9 ACKNOWLEDGMENTS

Identification of funding sources and other support, and thanks to individuals and groups that assisted in the research and the preparation of the work should be included in an acknowledgment section, which is placed just before the reference section in your document.

This section has a special environment:

```
\begin{acks}
...
\end{acks}
```

so that the information contained therein can be more easily collected during the article metadata extraction phase, and to ensure consistency in the spelling of the section heading.

Authors should not prepare this section as a numbered or unnumbered `\section`; please use the “acks” environment.

10 APPENDICES

If your work needs an appendix, add it before the “`\end{document}`” command at the conclusion of your source document.

Start the appendix with the “`appendix`” command:

```
\appendix
```

and note that in the appendix, sections are lettered, not numbered. This document has two appendices, demonstrating the section and subsection identification method.

11 SIGCHI EXTENDED ABSTRACTS

The “`sigchi-a`” template style (available only in L^AT_EX and not in Word) produces a landscape-orientation formatted article, with a wide left margin. Three environments are available for use with the “`sigchi-a`” template style, and produce formatted output in the margin:

- **sidebar**: Place formatted text in the margin.
- **marginfigure**: Place a figure in the margin.
- **marginfigure**: Place a table in the margin.

ACKNOWLEDGMENTS

To Robert, for the bagels and explaining CMYK and color spaces.

A RESEARCH METHODS

A.1 Part One

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A.2 Part Two

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B ONLINE RESOURCES

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