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

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ABSTRACT

When writing unit tests for Java artifacts with multiple dependencies, developers often introduce mock objects to mimic the dependencies' behaviour. Most Java static analysis frameworks, however, does not provide a tool to identify mock objects created in the unit test cases. The lack of mock object detection could misinterpret the test-to-code traceability, meaning the static analysis framework would mistakenly treat the method invoked by mock objects as the behaviour being tested in unit test cases.

In this paper, we introduce MockDetector, a technique to identify mock objects created within unit test cases. The tool is able to detect the common Java mocking libraries' API creating mock objects in a recursive manner. The collection of mock objects from the tool could later help static analysis tools identifying focal methods in unit tests with more precision.

CCS CONCEPTS

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

KEYWORDS

mock analysis, unit testing

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1 INTRODUCTION

2 APPROACH

3 EXPERIMENT SETUP

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 [**?**]; this section will simply show a few examples of in-text equations in context. Notice how this equation: $\lim_{n\to\infty} x = 0$, set here in in-line math style, looks slightly different when set in display style. (See next section).

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:

$$\lim_{n\to\infty} x = 0 \tag{1}$$

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:

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

just to demonstrate LaTeX'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 whats 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.

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

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```

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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 LaTeX source:

```
\citestyle{acmauthoryear}
```

Some examples. A paginated journal article [**?**], an enumerated journal article [**?**], a reference to an entire issue [**?**], a monograph (whole book) [**?**], a monograph/whole book in a series (see 2a in spec. document) [**?**], a divisible-book such as an anthology or compilation [**?**] followed by the same example, however we only output the series if the volume number is given [**?**] (so Editor00a's series should NOT be present since it has no vol. no.), a chapter in a divisible book [**?**], a chapter in a divisible book in a series [**?**], a multi-volume work as book [**?**], a couple of articles in a proceedings (of a conference, symposium, workshop for example) (paginated proceedings article) [**? ?**], a proceedings article with all possible elements [**?**], an example of an enumerated proceedings article [**?**], an informally published work [**?**], a couple of preprints [**? ?**], a doctoral dissertation [**?**], a master's thesis: [**?**], an online document / world wide web resource [**? ? ?**], a video game (Case 1) [**?**] and (Case 2) [**?**] and [**?**] and (Case 3) a patent [**?**], work accepted for publication [**?**], 'YYYYb'-test for prolific author [**?**] and [**?**]. Other cites might contain 'duplicate' DOI and URLs (some SIAM articles) [**?**]. Boris / Barbara Beeton: multi-volume works as books [**?**] and [**?**]. A couple of citations with DOIs: [**? ?**]. Online citations: [**? ? ?**]. Artifacts: [**?**] and [**?**].

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 LaTeX 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.
- `margintable`: 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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