



UNIVERSIDADE
FEDERAL
DE PERNAMBUCO

Graduação em Ciência da Computação

Searching for Atoms of Confusion in Swift

Student: Ian Mateus Vieira Manor (imvm@cin.ufpe.br)

Supervisor: Fernando Castor (castor@cin.ufpe.br)

Area: Software Engineering

Recife, September 10, 2018

Resumo

Estudos recentes em engenharia de software identificaram a existência dos chamados “Átomos de confusão” em código C. Esses são os menores possíveis padrões de código confuso. Ou seja, código cuja interpretação humana pode variar do da máquina, mas que pode ser facilmente transformado em uma forma mais entendível e fácil de manter. Esse trabalho visa replicar estudos existentes porém com outra linguagem, a linguagem de programação Swift. Átomos previamente identificados serão estudados através de pesquisas presenciais e online com programadores. Os dados coletados serão comparados aos guias de estilo existentes.

Abstract

Recent work in the software engineering field identified the existence of so-called “Atoms of Confusion” in C code. These are the smallest possible patterns of easily misinterpretable code. That is, code that can easily be transformed into a more understandable and maintainable alternate version. This work aims to replicate existing research with another language, the Swift programming language. Atoms that have previously identified will be studied through both in person and online surveys. The data collected will be compared with existing style guides for Swift.

1 Introduction

Atoms of confusion are a recent concept[1, 2]. Differently from code smells and antipatterns, these are patterns in code that are more tied to the structure of the programming language or specific usage patterns [Castor, 2018]. Research in this topic has already been successful in finding bugs in open source repositories by scanning them for atoms of confusion.

The Swift programming language is a modern, type-safe programming language built by Apple for use in their devices. In 2015 the language was been open-sourced and has been subsequently adapted for use in Linux systems [3]. Since then, multiple web frameworks have also been release that allow for websites and APIs to be written in Swift [4]. In the 2017 Stack Overflow Developer Survey, Swift came out as the 11th most popular language, and the 4th most loved.

This work proposes a study of the existence atoms of confusion in a more modern and still very popular language, while using a new web framework to conduct the required experiments.

2 Objectives

The main goal of this work is to refine an existing catalog of atoms of confusion in Swift, and to test their statistical significance empirically through a survey. To conduct the survey online according to the desired methodology, a simple website will be built using Server-Side Swift. The atoms found will be compared to existing Swift guidelines.

3 Methodology

This study should follow closely the work of Gopstein et al. for the C language. First, a list of questions will be prepared with short snippets of both obscured and transformed code. Subsets of these snippets will be presented in random order to each of the participants. The survey will be carried out both in person and through an on-line form, to gather a more comprehensive dataset.

In parallel to the preparation of the survey questions, the survey website will be built with Vapor using the Leaf templating engine. The website will be deployed through a cloud service such as Heroku or Vapor Cloud, with the data being stored anonymously in one of Vapor’s supported database services.

4 Schedule

	September			October				November				Dec.	
	1	2	3	4	5	6	7	8	9	10	11	12	13
Prepare Questions													
Distribute Survey													
Evaluate Results													
Impact Study													
Write Final Report													
Make Final Presentation													

Possible Examiners

- Leopoldo Motta Teixeira
- Kiev Gama

Referências

- [1] D. Gopstein, J. Iannacone, Y. Yan, L. A. Delong, Y. Zhuang, M. K.-C. Yeh, and J. Cappos, “Understanding misunderstandings in source code,” in *Proceedings of the 2017 11th Joint Meeting on Foundations of Software Engineering*. ACM, 2017.
- [2] D. Gopstein, H. H. Zhou, P. Frankl, and J. Cappos, “Prevalence of confusing code in software projects: Atoms of confusion in the wild,” in *MSR '18: 15th International Conference on Mining Software Repositories, May 28–29, 2018, Gothenburg, Sweden*. ACM, 2018, p. 11 pages.
- [3] “Swift is open source - swift blog - apple developer,” <https://developer.apple.com/swift/blog/?id=34>, accessed: 2018-09-10.
- [4] “Vapor web framework,” <https://vapor.codes>, accessed: 2018-09-10.

Signatures

Ian Mateus Vieira Manor
Student

Fernando Castor
Supervisor