

Term Paper

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| **The Warrior Stabs the Goat: Creating a Dothraki Resource Grammar with Grammatical Framework** |

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# Contents

[Contents I](#_Toc462406551)

[List of Figures II](#_Toc462406552)

[List of Tables II](#_Toc462406553)

[1. Introduction 1](#_Toc462406554)

[2. Methods 1](#_Toc462406555)

[2.1 Planning and Execution of the Project 1](#_Toc462406556)

[2.2 Project Structure 1](#_Toc462406557)

[2.3 Problems and Solutions 1](#_Toc462406558)

[3. Results 1](#_Toc462406559)

[4. Discussion 1](#_Toc462406560)

[4.1 Limitations 1](#_Toc462406561)

[4.2 Outlook 1](#_Toc462406562)

[4.3 Conclusion 1](#_Toc462406563)

[Appendix 2](#_Toc462406564)

[Source Code 2](#_Toc462406565)

[References 2](#_Toc462406566)

[Eidesstattliche Erklärung 3](#_Toc462406567)

## List of Figures

**Es konnten keine Einträge für ein Abbildungsverzeichnis gefunden werden.**

## List of Tables

[Table 1: Translation Examples 1](#_Toc462592579)

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“That woman which will stink has

stinked behind that tree.”

GF Run-Time System, 2016

## Introduction

Grammatical Framework (GF) is a functional programming language, created in 1998 (<https://en.wikipedia.org/wiki/Grammatical_Framework>) and designed to write (natural) language grammars. Since GF is “working from a language-independent representation of meaning” (Wikipedia) it can be used to generate or parse text in different languages at the same time. One of its functions is to translate between languages.

Since GF uses a symbolic approach to process and translate language, in many cases its translations are more precise than those of statistical tools we use in everyday life (Brown & Frederking, 1995). For example, the “Google Translate” service (<https://translate.google.com>) will produce ungrammatical sentences as soon as the input is too complicated while the GF translator (http://www.grammaticalframework.org/demos/translation.html) has no problems producing a correct translation (see Table 1).

Table 1: Translation Examples

|  |  |  |
| --- | --- | --- |
| Input | Output Google Translate | Output GF Translator |
| I heal these women. | Ich diese Frauen zu heilen. | |  |  | | --- | --- | |  | Ich verheile diese Frauen. | |
| The warrior will kiss that cheese behind the tree. | Der Krieger wird Kuss, der Käse hinter dem Baum. | Der Krieger wird jenen Käse hinter dem Baum küssen. |
| Diese heiße Frau ersticht diese Königin im Meer. | This hot woman heals the queen of the sea. | This hot woman heals this queen in the sea. |

This also means, that GF – other than Google Translate – depends on a large knowledge base of predefined grammar rules to achieve high-quality language processing: Its own standard library, the GF Resource Grammar Library, covers more than 38 different languages(http://www.grammaticalframework.org/lib/doc/status.html) – although many of them are not yet complete – and is still growing. In 2010, it already consisted of more than 500,000 lines of code (GF BOOK). As Grammatical Framework is an open-source project, and still under development, everyone is invited to use it or even help further develop it. For example, by adding languages to the library, which is the aim of the project described in this paper.

Our goal is to write a GF resource grammar for the Dothraki language and eventually be able to add it to the GF Resource Grammar Library.

The Dothraki language is a constructed language, developed by the language creator and writer David J. Peterson (<http://www.artoflanguageinvention.com/>).

The Dothraki are a fictional race of nomadic horse warriors in the “A Song of Ice and Fire” book series by George R. R. Martin. As it was adapted for television by HBO, the language bits found in Martin’s books had to be extended to a fully functional language (<https://web.archive.org/web/20160312100622/http://www.dothraki.com/about-dothraki/>). Today, Dothraki has a vocabulary of over 3,000 words (http://wiki.dothraki.org/Vocabulary).

Git hub https://github.com/GrammaticalFramework

Since .. language… a complicated and lengthy task,

, about this project, structure of this paper.

## Methods

### Planning and Execution of the Project

### Project Structure

### Problems and Solutions

## Results

Text.

## Discussion

### Limitations

### Outlook

### Conclusion

## Appendix

### Source Code

The complete source code can be viewed and downloaded on GitHub:

<https://github.com/mahen2/dothraki_gf>

### References

Brown, R., & Frederking, R. (1995). Applying statistical English language modeling to symbolic machine translation. In *Proceedings of the sixth international conference on theoretical and methodological issues in machine translation (TMI-95)* (pp. 221-239).

Peterson, D. J. (2014). *Living Language Dothraki: A Conversational Language Course Based on the Hit Original HBO Series Game of Thrones*. New York: Living Language.

Ranta, A. (2011). *Grammatical Framework: Programming with Multilingual Grammars.* Stanford: CSLI Publications.

## Eidesstattliche Erklärung

Hiermit erklären wir, dass wir die vorliegende Arbeit selbständig verfasst und keine anderen als die angegebenen Quellen benutzt haben.

Die Stellen der Arbeit sowie evtl. beigefügte Zeichnungen, Skizzen, graphische Darstellungen, die anderen Werken dem Wortlaut oder dem Sinn nach entnommen sind, haben wir unter Angabe der Quellen kenntlich gemacht.

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