# Title McMaster University

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Submission Date

# Abstract

# Dedication

# Acknowledgements

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### Introduction

1.1 Context: Knowledge Capture & Encoding

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1.2 Problem Statement

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1.3 Thesis Outline

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1.3.1 Capabilities of good knowledge capture, encoding, and usage – Drasil

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1.3.2 Drasil introduction

# Background

2.1 Project Focus & Goals

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2.2 In practice/Architecture

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2.2.1 Chunks

todo

2.2.2 ChunkDB?

todo

2.3 Methodology for locating and encoding knowledge - e.g., "bottom-up" approach

### 2.4 State of Drasil

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 $\begin{array}{ll} \textbf{2.4.1} & \textbf{Short-term problems} - \textbf{leading into topics} \\ \textbf{todo} \end{array}$ 

# Topic #1: Typing the Expression Language

3.1 Background: Problem

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3.2 Requirements & properties of a good solution

todo

3.3 Solution

todo

3.3.1 Expression encodings discussion (GADTs, TTF)

todo

3.3.2 Dividing expression languages (CodeExpr, Expr, ModelExpr, Literals)

# 3.4 Continued problem with Expressions – leading into ModelKinds

Topic #2: ModelKinds –
Theory types / discrimination
– "Expressions in context"

4.1 Problem

todo

4.2 Requirements & properties of a good solution

todo

4.3 Solution – ModelKinds

todo

4.3.1 Equational Models

### 4.3.2 EquationalRealms

todo

### ${\bf 4.3.3}\quad {\bf Equational Constraints}$

todo

#### 4.3.4 DEModel

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#### 4.3.5 Continued

# Chapter 5 Future Work

# Conclusion

# Appendix A Appendix