PhD Committee Meeting #4

Dan Szymczak

Computing and Software Department
Faculty of Engineering
McMaster University

June 28, 2018

Overview

1. Research Recap

2. Current Progress

3. Next Steps.

Research Topic Recap

Motivation

- Too much duplication!

Research Topic Recap

Motivation

- Too much duplication!
- (Re-)Certification is expensive

Research Topic Recap

Motivation

- Too much duplication!
- (Re-)Certification is expensive
- Inter-/intra-artifact consistency issues

Research Topic Recap

Motivation

- Too much duplication!
- (Re-)Certification is expensive
- Inter-/intra-artifact consistency issues
- Promote reusability

Research Topic Recap

Motivation

- Too much duplication!
- (Re-)Certification is expensive
- Inter-/intra-artifact consistency issues
- Promote reusability
- Design for change

Research Topic Recap

KBSE & The Drasil Framework

A Knowledge-Based Software Engineering Approach

- Too much duplication!
- (Re-)Certification is expensive
- Inter-/intra-artifact consistency issues
- Promote reusability
- Design for change

Research Topic Recap

KBSE & The Drasil Framework

A Knowledge-Based Software Engineering Approach

- Single knowledge-base
- (Re-)Certification is expensive
- Inter-/intra-artifact consistency issues
- Promote reusability
- Design for change

Research Topic Recap

KBSE & The Drasil Framework

A Knowledge-Based Software Engineering Approach

- Single knowledge-base
- Generate artifacts
- Inter-/intra-artifact consistency issues
- Promote reusability
- Design for change

Research Topic Recap

KBSE & The Drasil Framework

A Knowledge-Based Software Engineering Approach

- Single knowledge-base
- Generate artifacts
- Guaranteed consistency
- Promote reusability
- Design for change

Research Topic Recap

KBSE & The Drasil Framework

A Knowledge-Based Software Engineering Approach

- Single knowledge-base
- Generate artifacts
- Guaranteed consistency
- Reusable across projects
- Design for change

Research Topic Recap

KBSE & The Drasil Framework

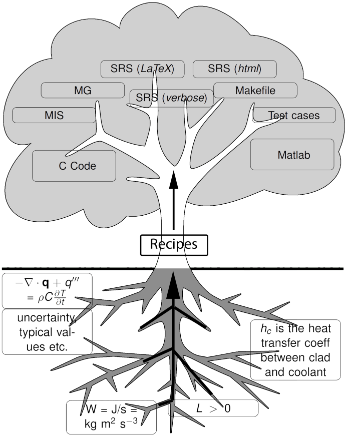
A Knowledge-Based Software Engineering Approach

- Single knowledge-base
- Generate artifacts
- Guaranteed consistency
- Reusable across projects
- Easy to mix and match

Research Topic Recap

KBSE & The Drasil Framework

Drasil – Towards generating Software Families


SRS (*LaTeX*)
SRS (*html*)
MG
SRS (*verbose*)
Makefile
MIS
Test cases
C Code
Matlab
Recipes
$-\nabla \cdot \mathbf{q} + q''' = \rho C \frac{\partial T}{\partial t}$
uncertainty, typical values etc.
h_c is the heat transfer coeff between clad and coolant
W = J/s = kg m^2 s^{-3}
$L > 0$

Research Topic Recap

KBSE & The Drasil Framework

Drasil – Towards generating Software Families

- One “source”, multiple views
- Full traceability
- Consistent-by-construction artifacts

Research Topic Recap

KBSE & The Drasil Framework

Drasil composed of many Domain-Specific Languages (DSLs) including, but not limited to:

- Knowledge Capture
- Recipes (Document generation)
- Code Generation

Current Program Progress

A brief overview

- Completed all necessary graduate courses & comprehensive examinations
- Currently Writing:
  - Journal paper for ACM TOSEM
  - Thesis

Current Program Progress

A brief overview continued

Research Project: Drasil proof-of-concept “complete”

- Scoped-down due to nature of project
- Generating SRS for six case studies & code for one
- Still improving with the help of summer students

Since Last Time

General

Summer 2017: Supervised 5 research students

- Cleaned up case studies
- Helped improve Drasil

Submitted a paper for SE-CoDeSE'17: Rejected

Began work on a paper for FASE 2018 – Scrapped

Met with OPG in January: Positive feedback

Currently co-supervising 3 summer research students

Writing

Since Last Time

Drasil-Specific

Total of 372 issues closed on the Drasil github

- Automated generation of some Drasil user-documentation using Haddock
- Created new chunk and referencing databases
- Added to, and refactored, the Drasil class hierarchy
- Finished creating Document Language (Continued on next slides)
- Implemented Continuous Integration testing
- General source clean-up and refactoring

Currently ∼130 open issues guiding development

Document Language

Next Steps

Broad Strokes

What next?

- Comprehensive examination part two.
- Complete final graduate level course.
  - Looking for a category theory course, but open to suggestions.
- Complete thesis.

Thank You!