# First Committee Meeting **Progress Report**

Jason Balaci

McMaster University

Oct. 21st, 2021

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- Introduction
- 2 Project
  - Drasil
  - Goal #1: Typed Expression Language
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Me, Fall 2019

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  - Hons. Actuarial and Financial Mathematics (B.Sc.)
  - Minor in Computer Science
- Currently pursuing a thesis-based Master's of Computer Science (M.Sc) at McMaster University, under the supervision of Dr. Jacques Carette



Me, Fall 2019

Course-related progression

• I'm required to complete<sup>1</sup>:

 $<sup>{\</sup>it 1\atop https://academic calendars.romcmaster.ca/preview\_program.php?catoid=45\&poid=23470\&returnto=9166}$ 

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  - CAS 701 "Logic & Discrete Mathematics" Theory course, Fall 2020
  - CAS 761 "Generative Programming" Software course, Fall 2020
  - CAS 763 "Certified Programming with Dependent Types" Theory & Software course, Winter 2021

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 COMPSCI 6TB3 "Syntax-Based Tools and Compilers" - Systems course, Winter 2021

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  - COMPSCI 6TB3 "Syntax-Based Tools and Compilers" Systems course, Winter 2021
- Together, the courses completed satisfies the "Courses Requirement" as mentioned in the academic calendar<sup>1</sup> and the "Regulations for the Computer Science M.Sc. Program" document<sup>2</sup>.

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Oct. 21<sup>st</sup>. 2021

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- Continuing to research "full-time".
- Attended a thesis defence to learn about what to expect from a thesis defence meeting (and learn about their research).
- Supervisory committee is formed, and we're currently having our first supervisory committee.
  - Supervisor: Dr. Jacques Carette
  - Dr. Spencer Smith
  - Dr. Wolfram Kahl

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  - Focus expanded...
- tries to "Generate All The Things"...
  - with a focus on research software.



## Drasil

"Generate All The Things!"

• TODO: here!

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### Drasil Case Studies

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  - Proportional Derivative Controller (PDController) Examining the output of a "Power Plant" (Process Variable) over time.
  - Solar Water Heating System (SWHS) Modelling of a solar water heating system with phase change material, predicting temperatures and change in heat energy of water and the PCM over time.

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- Slope Stability Analysis (SSP) Assessment of the safety of a slope (composed of rock and soil) subject to gravity, identifying the surface most likely to experience slip and an index of its relative stability (factor of safety).
- Heat Transfer Coefficients between Fuel and Cladding in Fuel Rods (HGHC) - Examining the heat transfer coefficients related to clad.

# Taking a closer look at one of the examples: GlassBR

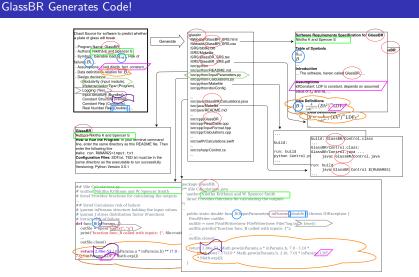


Figure created by Dr. Spencer Smith.

Which case studies currently generate code?

### Which case studies currently generate code?

Not all case studies generate code yet!

Some are a work-in-progress, and some require more infrastructure to enable it.

Where will I be contributing?

Fin.
Thank you!

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### References I



Carette, J., Smith, S., Balaci, J., Hunt, A., Wu, T.-Y., Crawford, S., Chen, D., Szymczak, D., MacLachlan, B., Scime, D., and Niazi, M. (2021).

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Yggdrasil.