First Committee Meeting

Progress Report

Jason Balaci

McMaster University

Oct. 21st, 2021

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2. Project
   - Drasil
   - Goal #1: Typed Expression Language
   - Goal #2: Model Discrimination – "ModelKinds"

3. References

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  - 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

Overview of Progression Towards C.S. M.Sc.

Course-related progression

- I'm required to complete[1]:

[1] https://academiccalendars.romcmaster.ca/preview_program.php?catoid=45&poid=23470&returnto=9166

[2] http://www.cas.mcmaster.ca/cas/0files/reg_master_cs_2019a.pdf

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- I've completed:
  - 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
  - COMPSCI 6TB3 "Syntax-Based Tools and Compilers" - Systems course, Winter 2021

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- Together, the courses completed satisfies the "Courses Requirement" as mentioned in the academic calendar[1] and the "Regulations for the Computer Science M.Sc. Program" document[2].

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- 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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Drasil...

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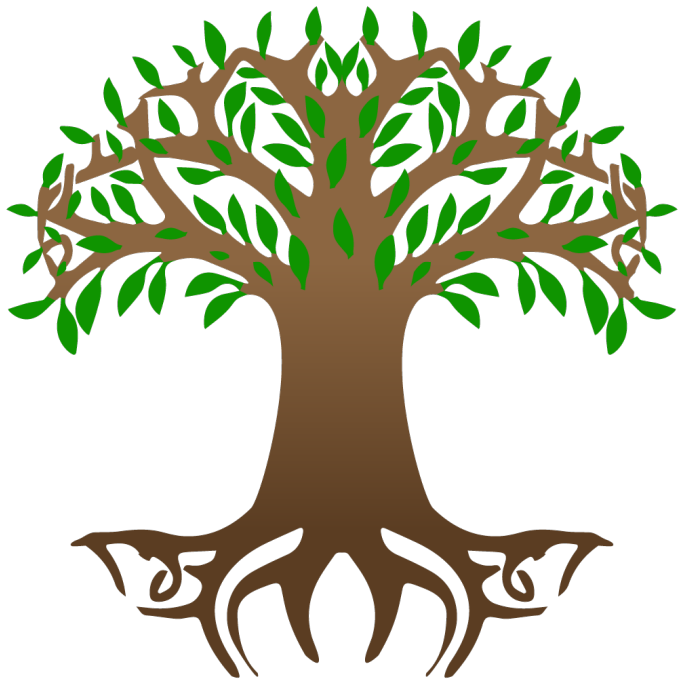

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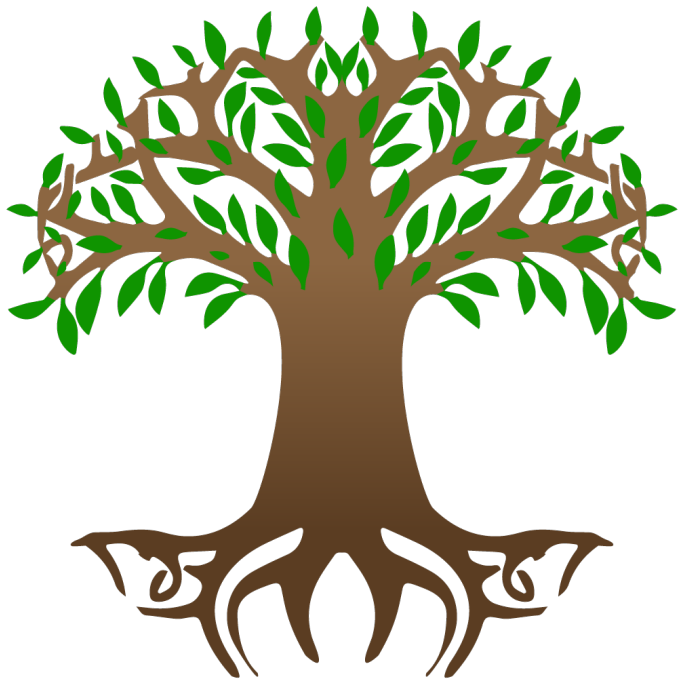

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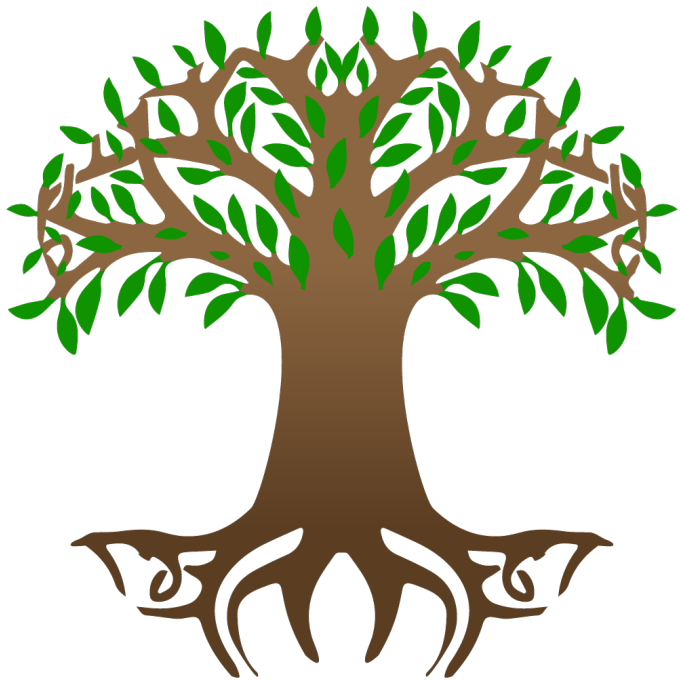

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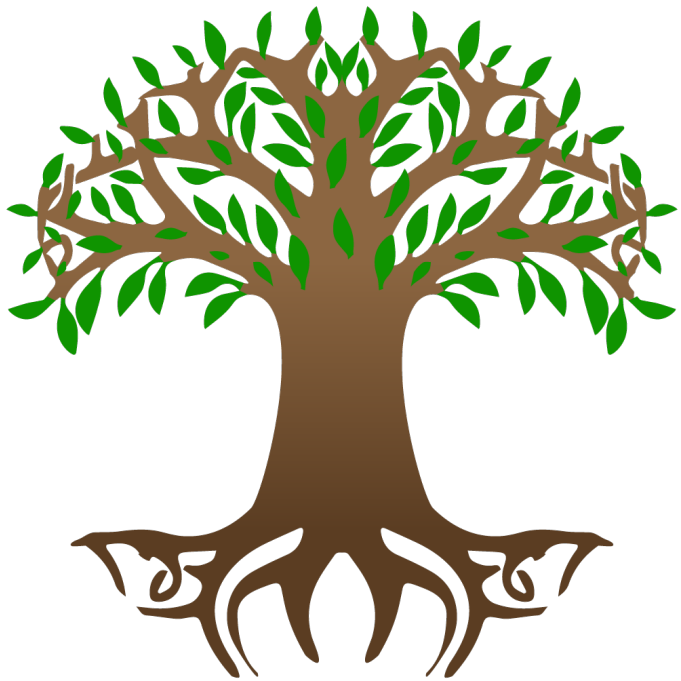

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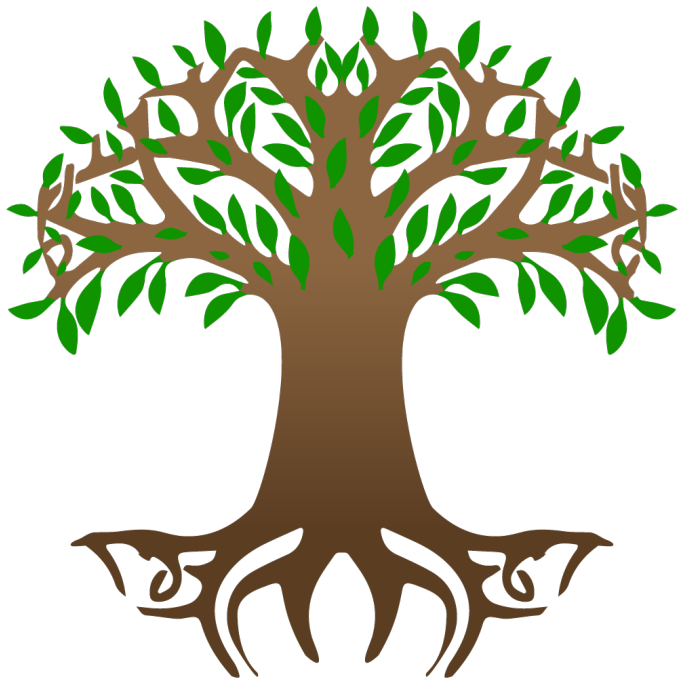

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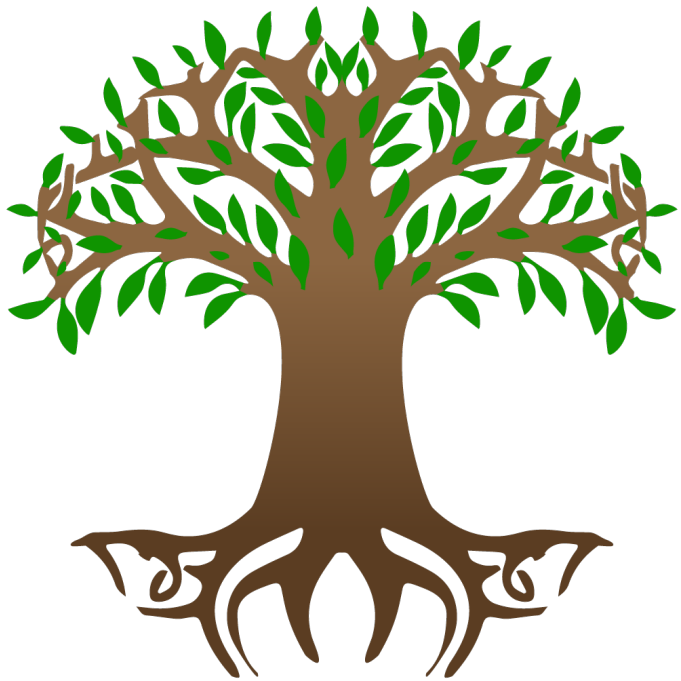

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- TODO: here!

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  - **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.

What does Drasil currently support?

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  - **SWHS without Phase Change Material (NoPCM)** - Modelling of a solar water heating system without 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).

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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.

Example: GlassBR

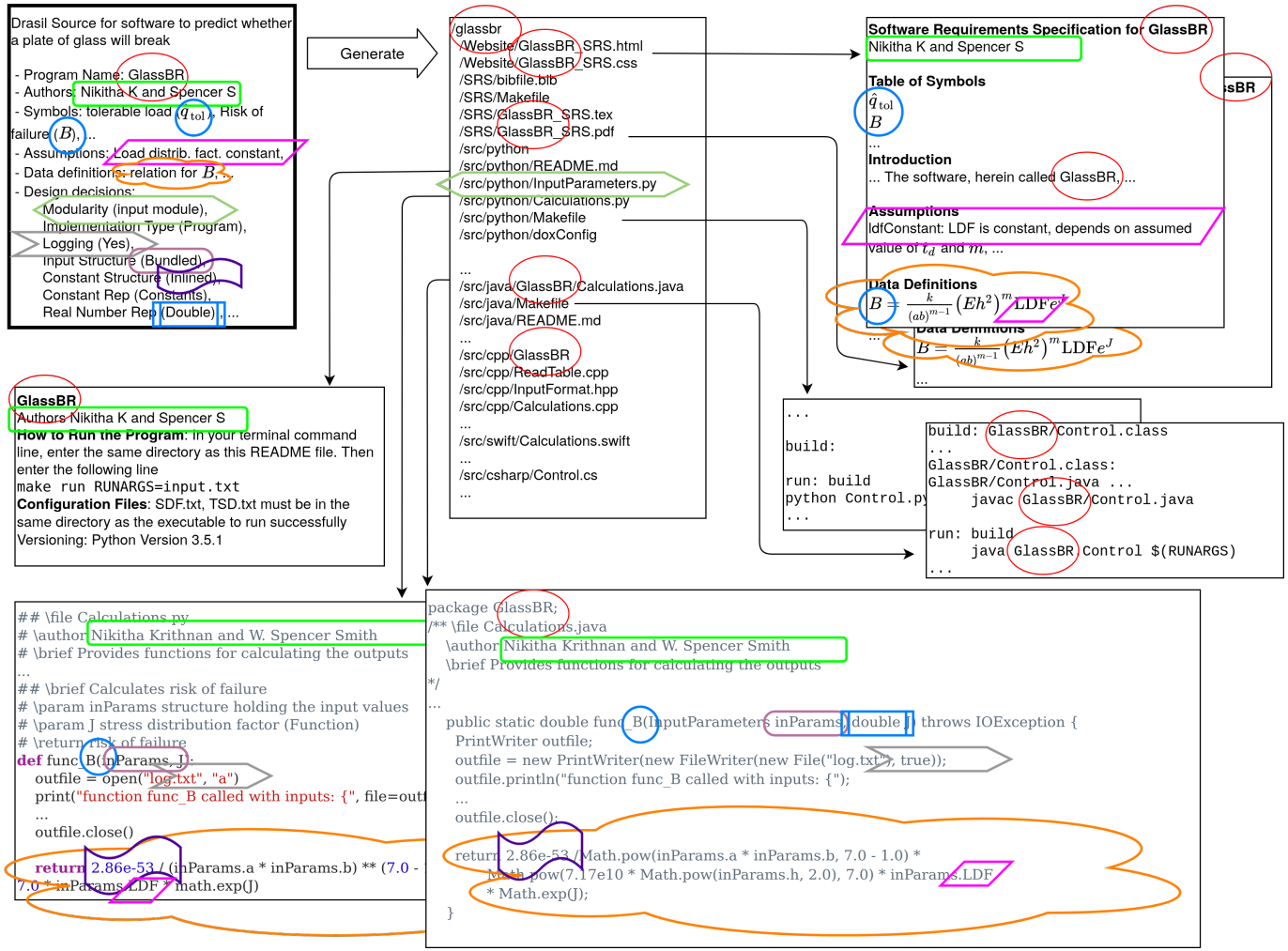

Figure created by Dr. Spencer Smith.

Which case studies currently generate code?

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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


Jacques Carette, Spencer Smith, Jason Balaci, Anthony Hunt, Ting-Yu Wu, Samuel Crawford, Dong Chen, Dan Szymczak, Brooks MacLachlan, Dan Scime, and Maryyam Niazi, *Drasil*, 2 2021.


Yggdrasil, Sep 2021.