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On behalf of the SciFlow Team

ParslFest 2020

6th October 2020



About Us

A final year undergraduate project in Software Engineering.

GitHub : <https://github.com/SciFlow-FYP>

Website : <https://sciflow-fyp.github.io/>

The team :

Dr. Nalin Ranasinghe

Mr. Malik Silva

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Ms. Kalpani Ranasinghe

About SciFlow

- Scientific workflow require complex interactions between individual computational modules, based on dynamic decision making. Therefore, a mechanism for proper coordination among the modules is necessary.
- Separation of computational components from workflow coordination provides programming flexibility and expressivity to the user, enabling easier workflow application generation.
- Parsl enables SciFlow to provide a layer of abstraction for cluster computing. This will benefit the Scientific Computing community by allowing domain experts to orchestrate complex workflows on a variety of HPC resources, with minimal effort.

- Solution:

Control-driven
Coordination

+

Implicit
Parallelism



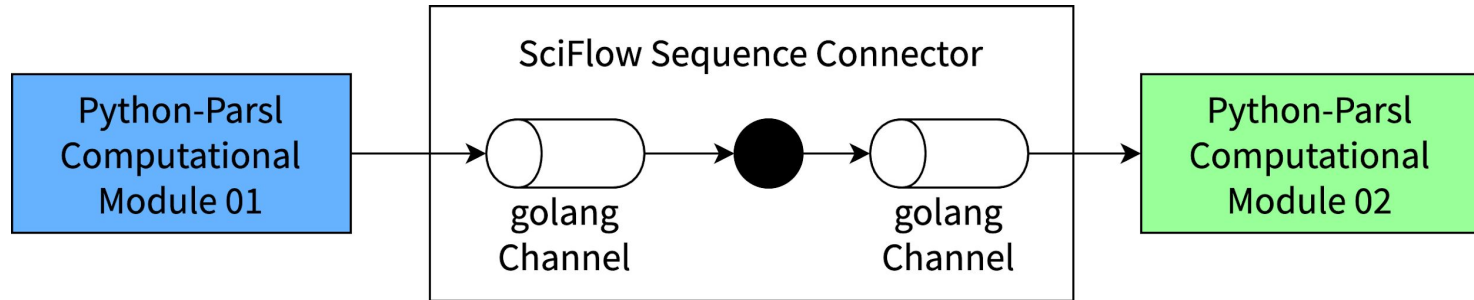
Controlled
Implicit
Parallelism



Golang

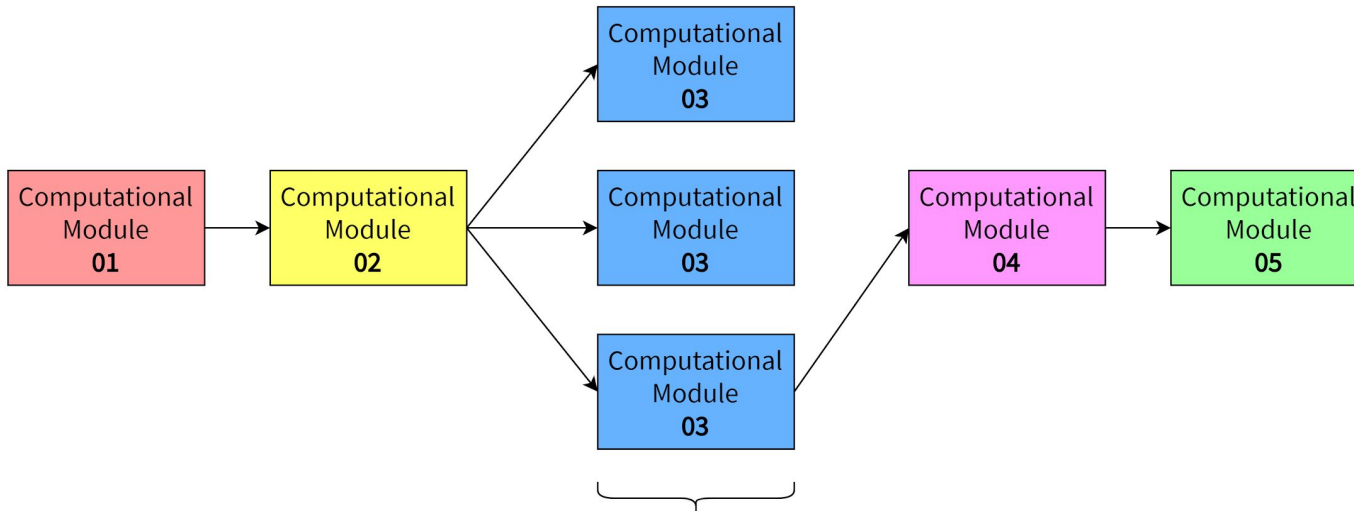


SciFlow Connectors

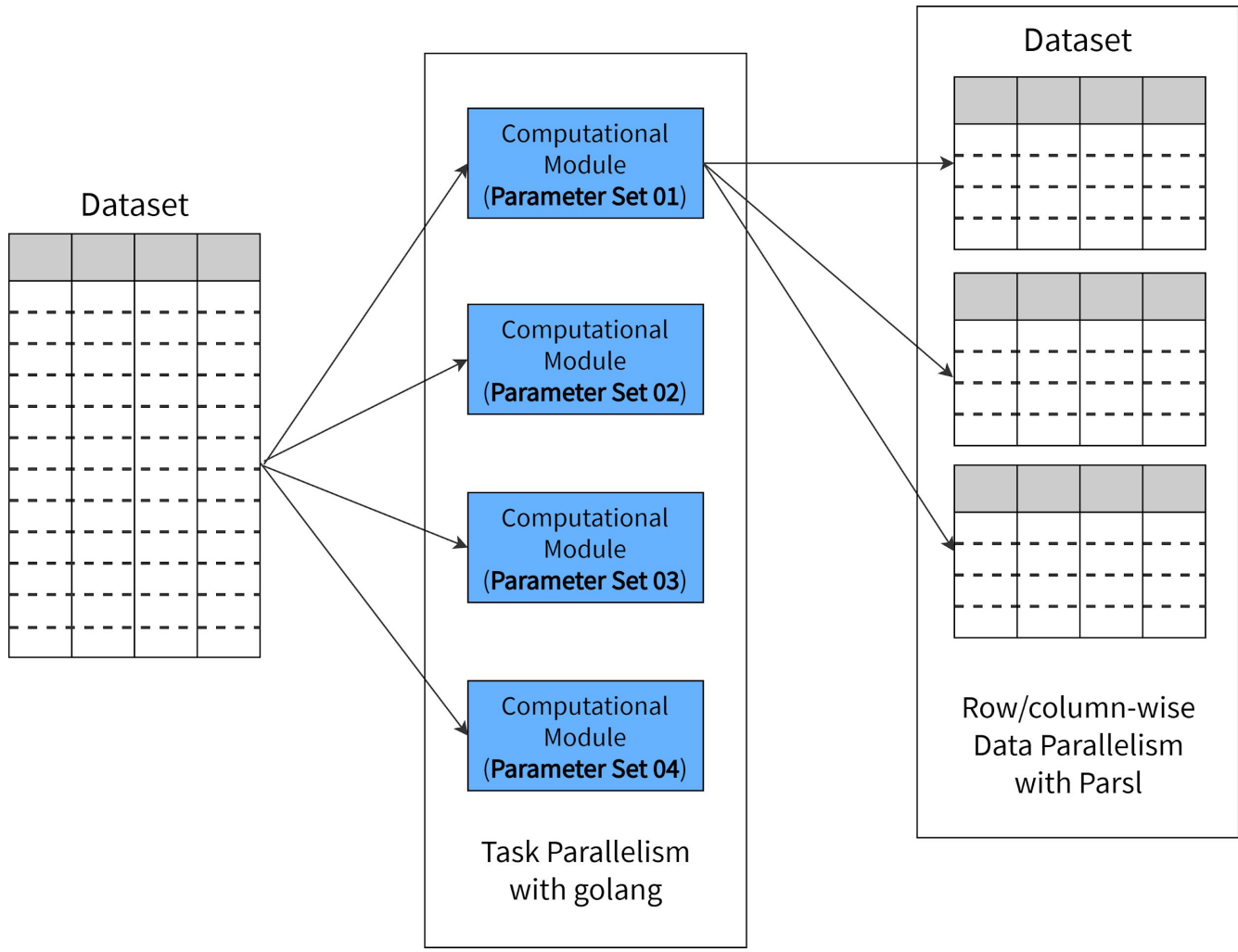


1. Sequence
2. Parallel Split
3. Synchronization
4. Exclusive Choice
5. Simple Merge
6. Multiple Merge
7. Loop

Scientific workflow coordination using golang channels



Execution location independence with **Parsl**



Parsl in SciFlow

- Scientists often do not possess low level programming knowledge, and higher level abstractions like Parsl enables them to harness the full potential of HPC resources with minimum effort.
- Large datasets in Scientific Computing applications can be easily data parallelized, row-wise or column-wise, using Parsl.
- SciFlow used Parsl to provide execution-location independence and ease in scaling.

Thoughts and Suggestions

- The predecessor to Parsl, the Swift website does not provide any connection to Parsl itself. Even though Parsl was a better fit for our project, getting to know of its existence took us more time than necessary. It could have been almost too late!
- Parsl could easily be integrated to any project, irrespective of its complexity or duration (SciFlow was an undergraduate project with a duration of one year).
- Highly responsive development team (special thanks to Mr. Ben Clifford).

Q & A

Feel free to email us at sciflowframework@gmail.com for further questions.