

RUPANSHU SOI

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EDUCATION

Birla Institute of Technology and Science, Pilani
Bachelor of Engineering in Computer Science

2018–2022
CGPA: 8.99

PROGRAMMING SKILLS

Languages C, Python, Lua, Go, Racket, [Regent](#)
Systems LLVM, Flex, Bison, Linux, CUDA, MERN stack, \LaTeX

RESEARCH EXPERIENCE

Charting LLVM using Software Engineering Techniques
MITACS Globalink Research Intern

Summer 2021

- Developed modular probes to extract information about LLVM passes.
- Collected information recursively enriches *maps* to assist developers.
- Advised by [Prof. Sébastien Mosser](#) and [Prof. Jean Privat](#).

Dynamic Analysis for Index Launches

Fall 2020–Spring 2021

- Wrote a dynamic analysis that allows a much larger class of loops to be safely index launched. [\[Code\]](#)
- Benchmarked it on the [Piz Daint](#) supercomputer.
- Advised by [Dr. Elliott Slaughter](#). Collaborated with [Legion](#) contributors.

Development of an Implicitly Parallel Meshfree Solver in Regent

Spring 2020

- Implemented a high-performance CFD solver in the Regent programming language. [\[Code\]](#)
- Advised by [Dr. Anil Nemili](#).

REFEREED PUBLICATIONS

R. Soi, M. Bauer, S. Treichler, M. Papadakis, W. Lee, P. McCormick, A. Aiken, E. Slaughter.
Index Launches: Scalable, Flexible Representation of Parallel Task Groups.
Supercomputing (**SC21**), to appear.

R. Soi, N. R. Mamidi, E. Slaughter, K. Prasun, A. Nemili, S. M. Deshpande.
An Implicitly Parallel Meshfree Solver in Regent. [\[Abstract\]](#)[\[Paper\]](#)[\[Slides\]](#)
2020 IEEE/ACM 3rd Parallel Applications Workshop: Alternatives to MPI+X (**PAW-ATM**).
In conjunction with Supercomputing (**SC20**).

SUMMER SCHOOLS

Programming Language Implementation Summer School (PLISS)

Summer 2021

Programming Language Analysis and Optimizations

Hosted online by IIT Hyderabad

Summer 2021

SELECTED PROJECTS

Open-Source Contributions to the Regent Compiler

2020–2021

- Added support for some bitwise operators, the `__future` keyword, and reported several bugs. [\[Pull Requests\]](#)[\[Bug Reports\]](#)

Misty: A Scheme Interpreter in Lua

Spring 2021

- Implemented lexical scoping, HOFs, and tail-call optimization. [\[Code\]](#)

Selective Repeat Inspired File Transfer Protocol in Racket*Spring 2021*

- Built reliability into the application layer over UDP sockets. [[Code](#)]

Runi: Handwritten Lexer and Parser in Go*Spring 2021*

- Wrote a CFG, lexer, and predictive recursive descent parser for a C-like language. [[Code](#)]
- Visualized the parse tree using Graphviz.

TEACHING ASSISTANTSHIPS

Operating Systems*Spring 2021***Differential Equations (Math III)***Fall 2020***Mechanics, Oscillations and Waves (Physics I)***Spring, Fall 2019***SCHOLASTIC ACHIEVEMENTS**

MITACS Globalink Research Internship*Summer 2021*

- A competitive 12-week research internship in Canada for international undergraduates.

10/10 Semester GPA*Fall 2018*

- Top 5 in 1100 students.

BITS Pilani Merit Scholarship*Spring, Fall 2019*

- Top 1-3% of the batch.

Sir CV Raman Prize*Spring 2019*

- Awarded once per semester for outstanding performance in Physics I.