RUPANSHU SOI

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EDUCATION

Birla Institute of Technology and Science, Pilani *2018–2022*
Bachelor of Engineering in Computer Science ***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 *Summer 2021*
MITACS Globalink Research Intern

- 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 3^{rd} 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 *Summer 2021*
Hosted by ACM India

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]

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

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

Misty: A Scheme Interpreter in Lua *Spring 2021*

- Implemented basic notions of types and lexical scoping. [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.