Snehasish Kumar

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Summary of Qualifications

– 3+ years of experience implementing analyses and transformation on LLVM IR.
– Design of LLVM IR abstractions for hardware accelerators. (published MICRO'16)
– Implementation of low overhead, dynamic profiling for characterization. (published IISWC'16)
– Interfacing LLVM IR to FPGA (Verilog) code generators for irregular programs. (published HPCA'17)
– Design and evaluation of coherence protocols for hardware accelerators. (published ISCA'15)
– Design and evaluation of variable granularity caching mechanisms. (published MICRO'12, ISCA'13)

Academic

05/13 – 11/16	**PhD in Computing Science**, *Simon Fraser University*, British Columbia, Canada, *4.0/4.0*.
01/11 – 04/13	**MSc in Computing Science**, *Simon Fraser University*, British Columbia, Canada, *3.8/4.0*.
08/06 – 04/10	**B. Tech in Computer Engineering**, *BPUT*, Orissa, India, *8.3/10.0*.

Technical Skills

Compiling for accelerators, workload analysis and microarchitecture modeling

Languages	C++11, C, Python
Frameworks	LLVM compiler infrastructure, Intel Pin

Professional Experience

06/13 – 12/13   Research Intern : Systems Technology and Architecture
IBM, T.J. Watson Research Centre
– Built a static analysis tool to find code regions hardware accelerators can target.
– Incorporated state of the art compiler techniques such as loop memory dependence analysis.
– In use at IBM Research till end of 2015 (2.5 years).

'11 – '16   Research Assistant : Computer Architecture Research Group, Simon Fraser University
– Adapted program analysis techniques to understand what to specialize in a workload.
– Designed an abstraction for partial specialization of workloads.
– Implemented automated, scalable characterization and program transformation tools in LLVM.
– Designed and evaluated a hybrid coherence protocol for accelerator rich architectures.
– Designed and evaluated a hardware accelerator for software data structures.

Awards

08/16	President's PhD Scholarship, Simon Fraser University
'16, '14, '12	Graduate Fellowship, Simon Fraser University
01/14	Special Graduate Entrance Scholarship, Simon Fraser University

Projects

01/15	Networks : Parallel implementation of Kou, Markowsky and Berman (1981) algorithm
04/14	Natural Language Processing : Optimizing the Bitpar CKY parser
12/11	Computational Geometry : Interactive demo for the Linear Cell Complex (CGAL)
04/11	Machine Learning : Non-Negative Matrix Factorisation for large datasets