

Prasanna Biswas

AI Software Solutions Engineer at Intel Corporation

Work experience

present

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Ian 2024

AI Software Solutions Engineer

Kernels, Falcon Shores, Intel Corporation

- Developing **high-performance kernels** with dynamic shape support for Intel's next-gen GPU using SYCL, optimizing latency, memory bandwidth, I/O access & compute utilization.
- Programmed an efficient **cumsum kernel**, achieving **2x perf improvement** over **IPEX** eager mode implementation.
- Designed and **implemented** complex operations like **TopK** and media operators such as **Brightness and Contrast** as graphs in C++ using MLIR types and attributes, enabling efficient GPU execution.
- Innovated a novel machine learning algorithm combining **VAEs** and **Diffusion Models** for NLP and CV.
- Co-authored two papers; one submitted to CVR 2025 and actively seeking conferences for the second.

Jan 2024

↑ Dec 2022 Senior ML Engineer

ML Applications, Cloud AI100, Qualcomm CR&D

- Spearheaded **ONNX optimizations** on Qualcomm's **AI100** accelerator, achieving an **8.5% performance boost** for large language models (LLMs) like **ChatGLM2-6B** through **nodefusions**, graph simplifications.
- Enhanced **GPT model** efficiency by **2x** through caching Key-Value matrices and minimizing DDR reads/writes.
- Designed a Graph Neural Network algorithm to enhance compiler efficiency, resulting in a filed patent.
- Led a three-member team in optimizing and deploying the top 120 models from Hugging Face library.

Nov 2022

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↑ Nov 2020 ML Engineer

 $ML\ Applications,\ Cloud\ AI100,\ Qualcomm\ CR\&D$

- Engineered software modules in C++ & Python.
- Introduced auto-detection of post-processing in CV models, replacing them with ABP & NMS optimized kernels for 80% improvement in quantization accuracy.
- Achieved a 28.2% perf improvement for (BERT and variants) through Graphcore's packing strategy.
- Enhanced operator support in the GLOW compiler for the Cloud AI100 SDK.

Patent and Publications

Dec 2024 Machine-Style Handwriting Generation with Diffusion

CVR 2025 Conference (Submitted)

Initiated and managed the curation of diverse text styles, established a robust data processing pipeline, and contributed to designing an algorithm for precise style generation.

Jun 2023

Pre-Processing For Deep Neural Network Compilation Using Graph Neural Networks

USPTO: 18/330,253 and 18/500,014 (Pending)

To understand topological information of models for optimizing inference-time latency

Jun 2018

Home Automation Using Panoramic Image Using IoT
Published in: 2018 ICRIEECE

Email

Contact

prasanna.biswas14@gmail.com

Phone

(+91) 9922365239

Profile

n /in/prasanna-biswas

Portfolio

prasannabiswas-iitb.github.io

M Tech, Thesis

Computational Model to Understand Emotions in Sarcasm

Created the 'emo-UStARD' dataset by annotating 'MUStARD' with 8 emo-

tions, arousal, and valence.
Conducted experiments, observing an
18% increase in accuracy across various
aspects of textual modality.

Technical Blogging & Content Creation

Technical Blogs

GPUs and CUDA Programming

YouTube Channel Co-Owner & Python Instructor

Successfully manage a channel with 1.5k+ subscribers.

Technologies

Programming:

• Python, C++

• GPU: SYCL(DPC++), CUDA

Machine Learning Frameworks:

• PyTorch

• ONNX, ONNX Runtime

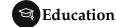
ML Domain & Techniques:

• NLP, CV

- Graph Optimization, GNN
- Quantization, Pruning, Node Fusion

Others:

- GPU Optimization
- Git, Docker
- GLOW (Machine Learning Compiler)



M Tech, 2020

• IIT Bombay CPI: 8.43/10

B Tech, 2018

• VESIT, Mumbai CPI: 9.07/10