

BAKSHREE MISHRA

EDUCATION

Masters in Computer Science

2015-2017

National Institute Of Technology, Rourkela

ADVISORS: Prof. Bansidhar Majhi (NIT Rourkela), Mr. Tarjinder Singh (Intel)

GPA: 9.69/10

Bachelors in Computer Science and Engineering

2010-2014

College Of Engineering and Technology, Bhubaneswar

GPA: 8.85/10

PUBLICATIONS

Mishra, B. and Chakraborty, D. and Makkadayil, S. and Patil, S. D. and Nallani, B. *Hardware Acceleration of Computer Vision and Deep Learning Algorithms on the Edge using OpenCL*, appeared in the Proceedings of EAI Endorsed Transactions on Cloud Systems, 2019 [\[Paper\]](#)

PROJECTS

Real-Time Barcode Localization and Detection on Edge Devices

- Industrial problem which required decoding barcode on fast moving objects from camera feed
- Created custom accelerator for the algorithm bottleneck, Barcode localization, using OpenCL HLS
- Highly pipelined architecture leveraging data redundancy in algorithm
- Improved performance from **19 FPS** to **104 FPS** on 2MP video to satisfy industrial constraints
- **Paper** accepted at Intel Design and Test Technology Conference (DTTC), 2019

Real-Time Optical Character Recognition on Edge Devices

- Created CNN topology and trained on in-house character image dataset
- Created OpenCL based FPGA accelerator having parallel convolution engines and buffered partial results
- Accelerator improved performance from detected 250 characters at **10 FPS** to **50 FPS** from 2MP video
- Presented **live demo** at Intel DTTC, Portland, OR, 2019
- **Paper** presented at IEEE WinTechCon, Bangalore, India, 2019

Context-Aware Voice Assistant

- Created an always on, context-aware NLP agent to offer recommendations instead of executing commands
- Trained Bi-LSTM based SLU algorithm to understand context over conversations and multiple sentences
- Used Mycroft framework to create end-to-end Voice Assistant as proof of concept

Hardware Design for Functional Safety IP

- Learnt traditional HW design using RTL to implement Fault Detector module for Functional Safety (FuSa)
- Went through High Level as well as Micro Architecture Specifications for designing hardware
- The IP achieved ISO26262 certification for Functional Safety and is in the **patent filing** process
- **Paper** accepted at Intel DTTC 2019

Software Modeling of CV/ML System on Chip (SoC)

- Reviewed internal and third party architecture specifications to model SoC on Hybrid-FPGA platform
- Found critical bug in bootloader code impacting secure boot
- Booted OS on H-FPGA platform successfully and enabled early FW and SW development

Real-Time Pedestrian Detection System Using OpenCL-Based FPGA Acceleration

- Created a custom architecture for computer vision based Pedestrian Detection system for Master's research
- Deep-dived into FPGA OpenCL compiler optimization issues and found impactful solutions
- Independently improved initial design to give **3x** performance while reducing area by **10x**
- Proposed a mnemonic algorithm optimization to reduce computations, was suggested for **patent filing**

SELECT AWARDS AND HONORS

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|--|------|
| • Multiple Intel Division and Department Recognition Awards (2017-2020) | 2020 |
| • 2 nd Runners' Up in Intel India WIN Hackathon | 2017 |
| • 2 nd rank holder in CS Department (out of ~110 students) at NIT Rourkela | 2017 |
| • CET Merit Scholarship (Undergrad scholarship 2010-2014) | 2010 |
| • Selected for National Talent Search Examination Scholarship | 2008 |
| • Rajiv Gandhi Chhatra Prativa Award for securing 8 th rank in State, X th CBSE Boards | 2008 |

WORK EXPERIENCE

Analysis and acceleration of Machine Learning Algorithms	June 2017-Present
Machine Learning Engineer	<i>Intel Corporation, Bangalore</i>

Acceleration of Pedestrian Detection and other ADAS Algorithms	May 2016-May 2017
Graduate Technical Intern	<i>Intel Corporation, Bangalore</i>

Development of E-Municipality portal	June 2014 - July 2015
Assistant System Engineer	<i>Tata Consultancy Services, Bhubaneswar</i>

Prototype modules for E-Municipality portal	June 2013 - August 2013
Summer Intern	<i>Tata Consultancy Services, Bhubaneswar</i>

TECHNICAL SKILLS

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|--|--|
| • Programming/Scripting Languages | C/C++, Python, Shell Scripting, Java, C#, MATLAB, OpenCL |
| • Tools | Quartus, Design Compiler, Eclipse |
| • Databases | Oracle 10g, SQL Server |

EXTRA CURRICULAR INTERESTS AND ACTIVITIES

Volunteering

- Regularly volunteer to conduct **music therapy** at a **Cancer Hospice**, Karunashraya (2018 - Present)
- Won an Intel Seed Grant and oversaw renovation of **nurses' dining hall** at Karunashraya (2019)
- During undergrad, co-founded the student e-zine **CET Rising**, and served as **Chief Editor** (2013 - 2014)

Creative Writing, Music

- I blog, review the occasional book and publish some of my poems at bakshree.wordpress.com
- Occasionally, I pen and compose songs, and recently created a YouTube channel for the same. [\[Link\]](#)
- My poem was published in a peer-reviewed anthology by Bangalore Poetry Circle, **Anthargatha**, 2020