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CURRICULUM VITAE

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Bakshree Mishra
Machine Learning Engineer
Intel Corporation

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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

- Multiple Intel Division and Department Recognition Awards (2017-2020)   2020
- 2nd Runners' Up in Intel India WIN Hackathon   2017
- 2nd 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 8th rank in State, Xth CBSE Boards   2008

Work Experience

Analysis and acceleration of Machine Learning Algorithms   June 2017-Present
Machine Learning Engineer   *Intel Corporation, Bangalore*

Acceleration of Pedestrian Detection and other ADAS Algorithms   May 2016-May 2017
Graduate Technical Intern   *Intel Corporation, Bangalore*

Development of E-Municipality portal   June 2014 - July 2015
Assistant System Engineer   *Tata Consultancy Services, Bhubaneswar*

Prototype modules for E-Municipality portal   June 2013 - August 2013
Summer Intern   *Tata Consultancy Services, Bhubaneswar*

Technical Skills

- **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