TESSITA THOMAS

MBA [TM], BE [ECE]

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PROFESSIONAL EXPERIENCE:

Multimedia Engineer with experience in Digital Image processing Algorithms, Video Compression standards (H.264, HEVC), High Performance Concurrent programming(GPU, CUDA) and Computer Vision Modules.

CAREER HISTORY:

Total Experience: 12.5 years **Location: Bangalore**

July 2021 - Present _____ Associate Principal Engineer, Toshiba Software India Pvt. Ltd
Mar 2020 - July 2021 _____ Sr Software Engineer, K2O Consulting Pvt. Ltd
Dec 2017 - Dec 2019 _____ Consultant, Sony India Software Centre Pvt. Ltd
(Technical Specialist Outsourced from Skillmine Technology Consulting)
Mar 2014 - Dec 2017 _____ Engineer, Canon India Pvt. Ltd
Sep 2013 - Mar 2014 _____ Consultant, Canon India Pvt. Ltd
(Sr Software Engineer Outsourced from Intsemi Technologies)
Dec 2010 - Sep 2013 _____ Sr Engineer, Tata Elxsi

TECHNICAL SKILL SET:

Domain	:	Image Processing, Video Codecs - H.264, HEVC, HPC (GPU), Computer Vision.
Operating System	:	Windows, Linux, Android
Programming Languages	:	C, C++, CUDA, Python, Shell Scripting, OpenCV, OpenVX, Open3D, SSE Intel Intrinsic, Halide (DSP Toolkit : Hexagon SDK)
Version Control Systems	:	Win CVS, TortoiseSVN, TortoiseGit, GitHub, Bitbucket
Compiler Tools	:	Microsoft Visual Studio, Intel C++ compiler, Intel Parallel Studio
IDE & Other Tools	:	CUDA Visual Compute Profiler, Nvidia NSight Systems, Intel Vtune Performance Analyzer/Amplifier, Eclipse, Beyond Compare, WinSCP, Elecard StreamEye, JIRA, Putty, Kayak 1.6, Octave, ImageJ, Redmine, MatLab.

PROJECT PROFILE:

1. Toshiba Software India Pvt. Ltd

Medical Image Processing Application Plugin Development and Linux Porting

- ➢ Migration of medical image processing algorithms to Linux platform.
- ➢ Analysis of medical image processing algorithms.

Medical Image Processing Application GPU Porting and Optimization

- ➢ Porting and optimization(Architecture, Algorithm, Memory, Thread) of medical image processing applications on different CUDA toolkits and Nvidia GPU cards (GeForce RTXA4000 / Quadro P5000).
- ➢ Feasibility analysis of optimization of CUDA Kernels.
- ➢ Enhancement of Image quality, testing and bug fixes.

2. K2O Consulting Pvt. Ltd

3D Dental Image Processing Algorithm Optimization on Nvidia GPU card (GeForce RTX2070)

- ➢ Porting and optimization of OpenCV/C algorithms such as Bilateral filter, Gaussian Filter, Median Filter, Erode, Dilate, Phase Wrap/Unwrap, Gamma correction, Noise Removal to CUDA.
- ➢ Feasibility analysis of optimization of Open3D CUDA code.

3. Sony India Software Centre Pvt. Ltd

DSP Algorithm Optimization

- ➢ Feature addition and optimization of the Phase detection algorithm using C and Halide.
- ➢ Feasibility study and code development to support UBWC.
- ➢ Porting of the DSP algorithm from Device offload mode to device standalone mode.
- ➢ Porting of the DSP algorithm in the Android NDK environment.

Computer Vision API Test Framework Development

- ➢ Test framework development for Computer Vision algorithms like Feature point detection, classification, Pyramid Downscale, Down sampling.

Image Processing Algorithm Optimization on Nvidia GPU card (GTX960)

- ➢ Porting and testing of Geometric Transformation and CCNR in C and CUDA.

4. Canon India Pvt. Ltd

H.265 Encoder Optimization Feasibility Study

- ➢ Analyzing H.265 Encoder modules for optimization on Core i7/Xeon with Intel intrinsic.

Image Processing Algorithm Development

- ➢ Development of Unit and Joint Test Framework in C/Python/Shell.
- ➢ Test Case identification and Cross Reference Data generation.

HEVC Encoder Development

- ➢ Development of De-blocking Module in frame basis and LCU basis using C++ for 8bpp input.
- ➢ Development of SAO Module of HEVC on LCU basis using C++ for 8bpp input.
- ➢ Mapping and parsing of Encoder data into Hardware specific format. Interpolation module support.

5. Tata Elxsi

HEVC Decoder Development

- ➢ Optimization of Intra Prediction Module using instruction set (SSE2/3/4.1) Intel intrinsic.
- ➢ Creating a plugin for HEVC decoder in the Kayak framework for Digital Rapids using C++ and multithreading using Windows threads.
- ➢ Porting HEVC decoder applications and libraries from Windows to Linux platform.

MBAFF support in H.264 Main Profile Decoder

- ➢ Implementation of MBAFF support for Intra prediction and CAVLC modules.

H.264 High Profile Encoder Optimization

- ➢ Porting for Half Pixel Interpolation module CUDA on Nvidia GPU (GTX580) (9x Improvement).
- ➢ Optimization of Half Pixel Interpolation Module using C and SIMD instructions (SSE intrinsic-achieved 7x performance) for 8 bpp and 10 bpp input.

Feasibility Study for H.264 Encoder GPU Optimization

- ➢ Benchmarking GPU programming languages CUDA and OpenCL (Nvidia and AMD GPU).
- ➢ Analyzing H.264 High Profile Encoder Codec modules for optimization.