ACKNOWLEDGEMENT

I would like to express my heartily thanks to **Dr. Neeta Pandey**, Department of Electronics & Communication Engineering, Delhi Technological University , my academic guide for overall motivation, support and guidance during this project.

.I would like to sincerely thank my supervisor **Dr. Kaushik Saha (Principal Member Technical Staff, STMicroelectronics India)** for providing me such a Challenging project to work on. His constant guidance and invaluable suggestions throughout the project and his critical approach to problems has led to the successful completion of this project.

I am very thankful to **Prof. P.B. Sharma** (Honorable Vice Chancellor of Delhi Technological University) ,to Prof. S Maji (Dean IRD) and to Prof. B.D. Pathak who have allowed me to do project under the Guidance of **Professor Asok Bhattacharyya** in collaboration with STMicroelectronics India in a very challenging problem.

Furthermore, I am also thankful to **Mr. Surinder Pal Singh (Senior Member Technical Staff, STMicroelectronics India,** Greater Noida) for their support and encouragement during this project. It has been very enlightening and enjoyable experience to work with him.

I wish to express my great thanks to my friend **Devendra Gupta** who supported me in all the endeavors I had during thesis work.

Finally, I owe many thanks to my colleagues and friends for making my stay in DTU and STMicroelectronics Greater Noida memorable.

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Abstract

Khronos Group created the OpenCL standard that allows using full compute power of a computer. The goal of this thesis is to show how to utilize the current advantages of OpenCL language by implementing motion estimation algorithm. Motion estimation is the process of determining motion vectors that describe the transformation from one 2D image to another usually from adjacent frames in a video sequence.

In this project we have implemented & tested different algorithms for achieving faster performance for generating motion vectors between two consecutive frames .This is a part of MCTI technology for generation of best quality video. Motion vector generation has been done on forward & backward matching of frames and is being tested on C & OpenCL on different algorithms.

We have achieved very interesting and surprising results by varying sequential code to parallel code on GPUs. We have achieved 16ms per frame and have tested our code on two GPU cards

1. Nvidia Quadro NVS 295
2. Nvidia GTX 285

Thanks to an accessible programming environment and nearly full support of the C programming language, a large number of established APIs for images and pixel operations and bilinear prediction has already been ported to run on GPUs.