Team Name : **Team Xion**

Problem Statement : **Object detection in autonomous vehicles.**

Brief about the Idea

- We build Sign-Detection Software for the vehicle to make the Ride safe and secure.
- Sometimes people Ride their vehicle while talking on call or sometimes they drink and drive and these types of mistakes lead to some deadliest accidents.
- Because they forget to focus on signs and do over speed and break safety rules while driving, we are building software to avoid this type of situation so the rider can have a safe drive and no accident will happen because of his mistake.

OPPORTUNITY

How will it be able to solve the problem?

- It will detect road signs and in a situation, if someone isn't following the road sign then it will give an alert indication in serious case emergency breaks and safety activation.

How different is it from any other existing ideas out there?

- It will be more accurate and secure than existing ideas and it will be more flexible Because we are using oneAPI which is oneDNN for optimization and oneDAL.

Introduction

➢ **Traffic Sign**

- Traffic sign or road signs are signs erected at the side or above to give instruction or provide information to road users.
- Signs are treaty signed in 1968 which has been able to standardize traffic signs across different countries.
- There are some examples of traffic signs

❑ **Warning signs:** Warning signs are to warm of hazards or a hazardous condition.

				
Left Reverse Bend	Steep Ascent	Steep Descent	Narrow Road Ahead	Road Wideness Ahead
				
Narrow Bridge	Slippery Road	Loose Gravel	Cycle Crossing	Pedestrian Crossing

- **Prohibitory signs :** Prohibition signs specify behaviour or actions which are not permitted.

- **Mandatory signs :** Mandatory signs are road signs which are used to set the obligations of all traffic which use a specific area of road.

Traffic Sign Recognition

- Traffic-sign recognition is a technology by which a vehicle is able to recognize the traffic signs put on the road e.g., "speed limit" or "turn ahead".

- The first TSR systems which recognized speed limits were developed in cooperation with Mercedes-Benz.

- **Traffic Sign Recognition(TSR):**
  - Detection
  - Classification

Methodology

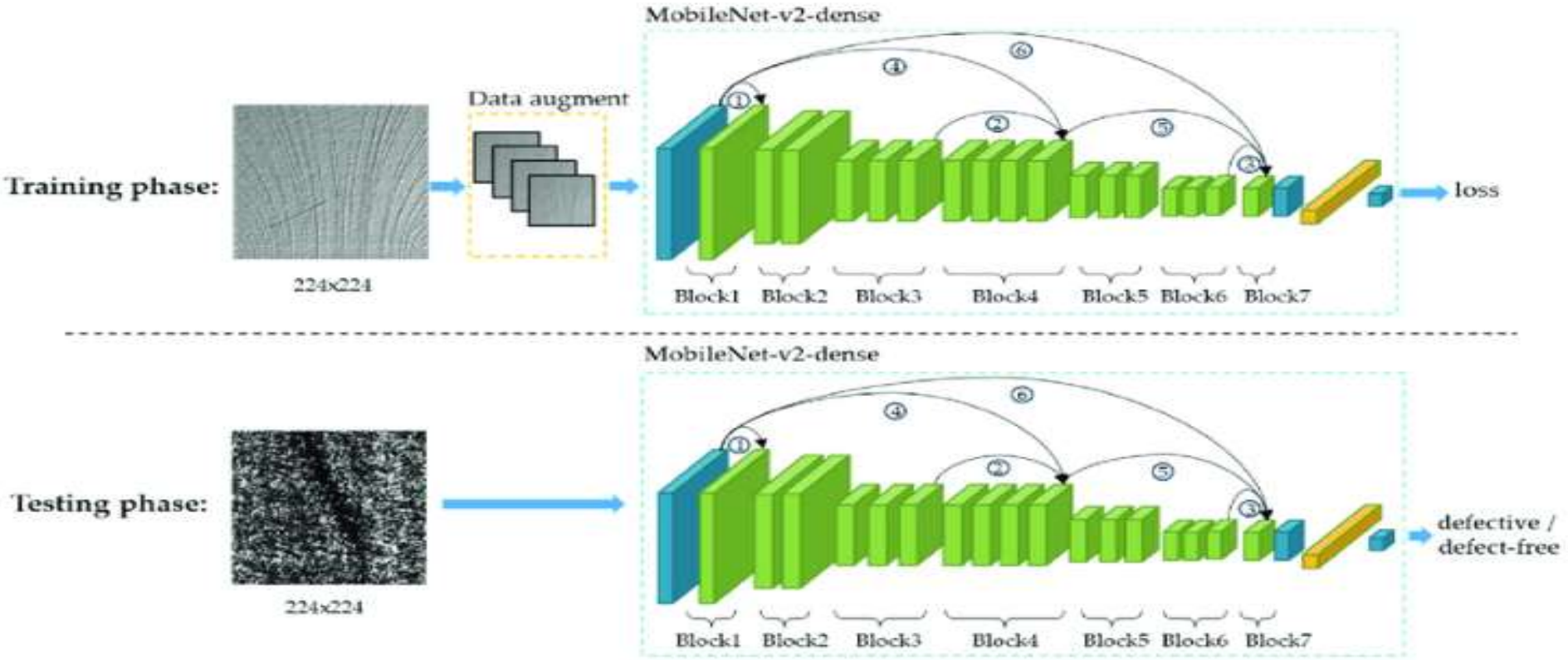
- We propose a system for the automation classification of traffic signs. openVINO and oneDAL model are used to recognize the information contained in the traffic panel board on the street like shape, colour or symbols.
- The classification of the symbol is applied to those images where a traffic panel has been detected,

- The work is divided into two phases:-
- Feature Extraction Phase.
- Classification Phase

List of features offered by the solution

- Use of oneAPI: It will be based on object detection and future prediction algorithm using oneAPI libraries.
- Real-time sign detection: The system can detect signs in real-time using cameras or other sensors.
- Sign recognition: The system can recognize the type of sign, such as a stop sign or a yield sign.
- Localization: The system can locate the position of the sign within an image or video frame.
- Classification: The system can classify the type of sign based on its visual features, such as its shape, colour, or text.
- Segmentation: The system can segment the sign from its background in order to improve recognition accuracy.

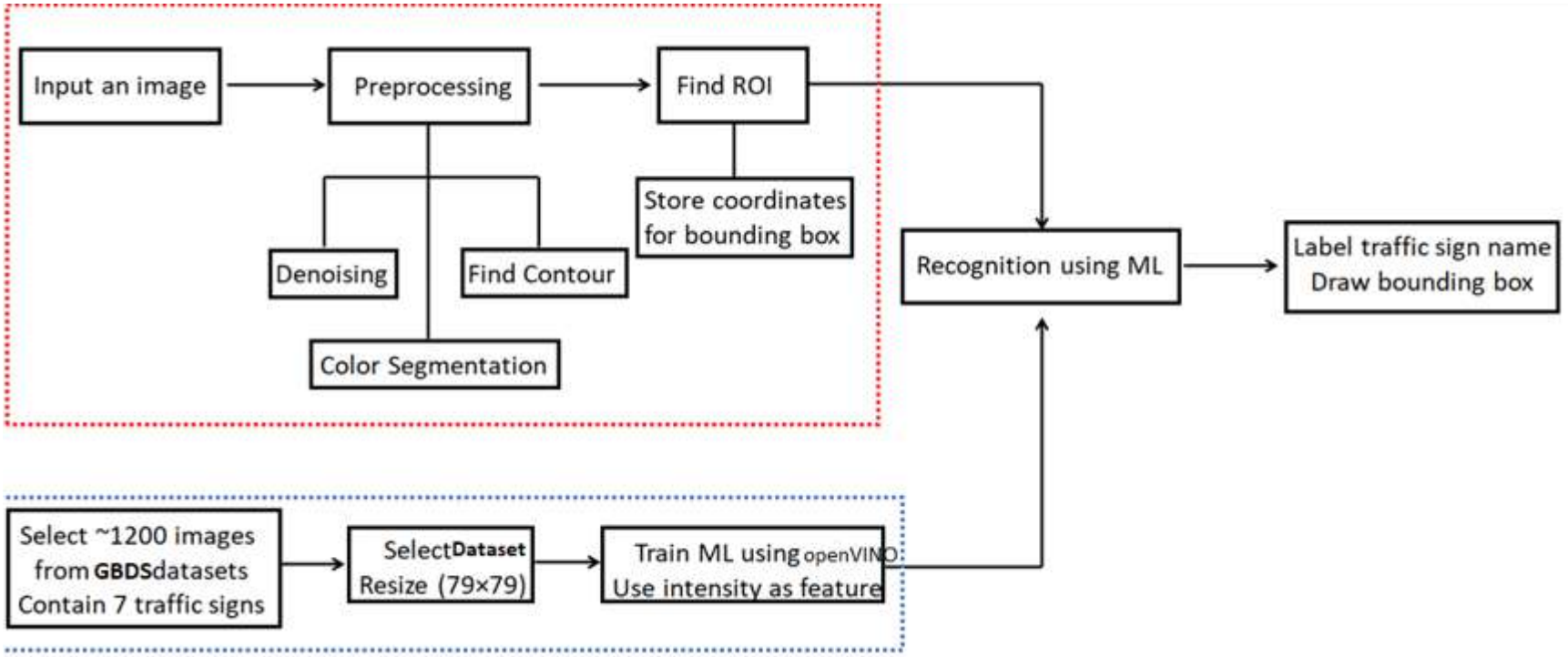
MODEL


MobileNet-v2-dense
Data augment
Training phase:
224x224
loss
Block1
Block2
Block3
Block4
Block5
Block6
Block7
MobileNet-v2-dense
Testing phase:
224x224
defective /
defect-free
Block1
Block2
Block3
Block4
Block5
Block6
Block7

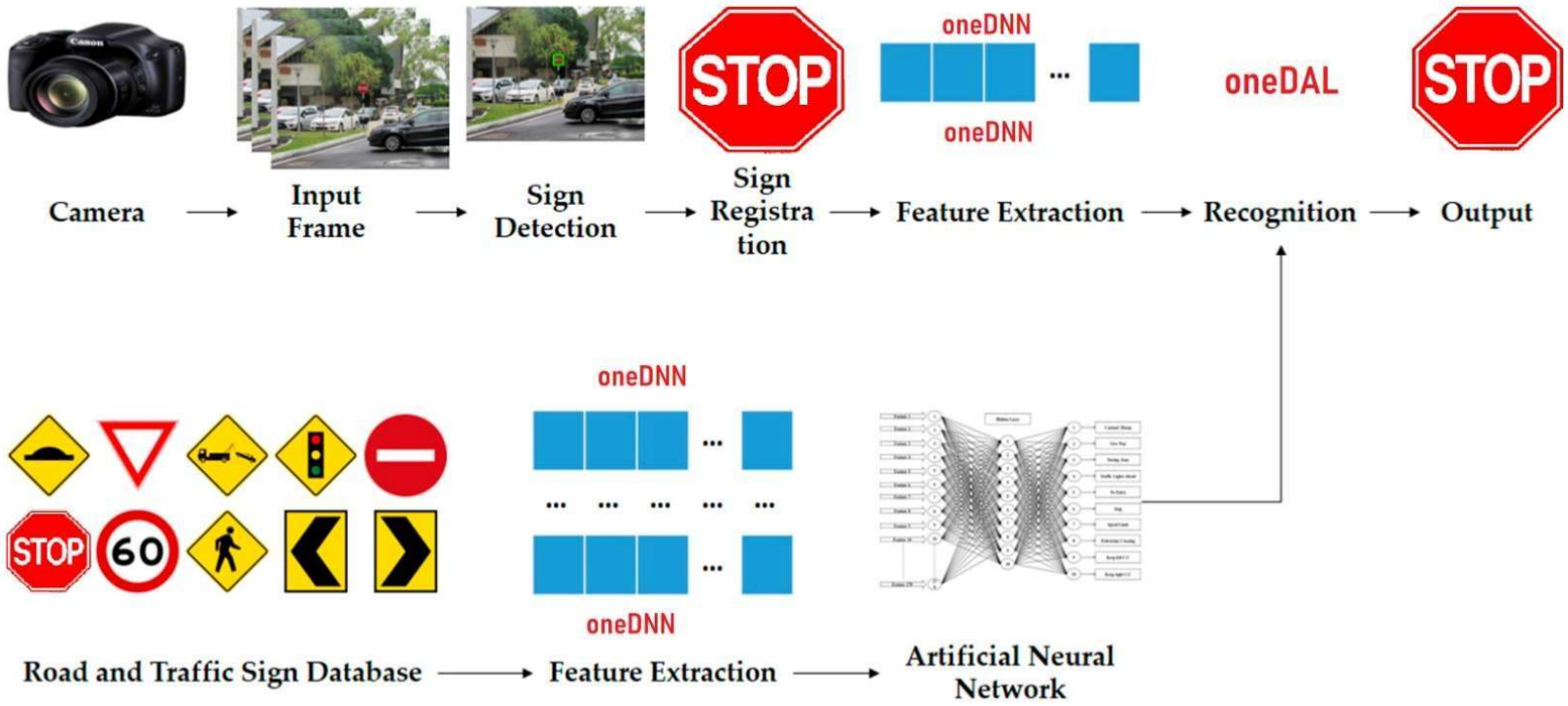
List of oneAPI Ai Analytics Toolkits, its libraries and the SYCL/DPC++ Libraries used

- oneDAL (for classification of Train dataset with data extracted from images using oneDNN)
- oneDNN
- OpenVINO (it is used to train module)

Process Flow Diagram



Architectural Diagram



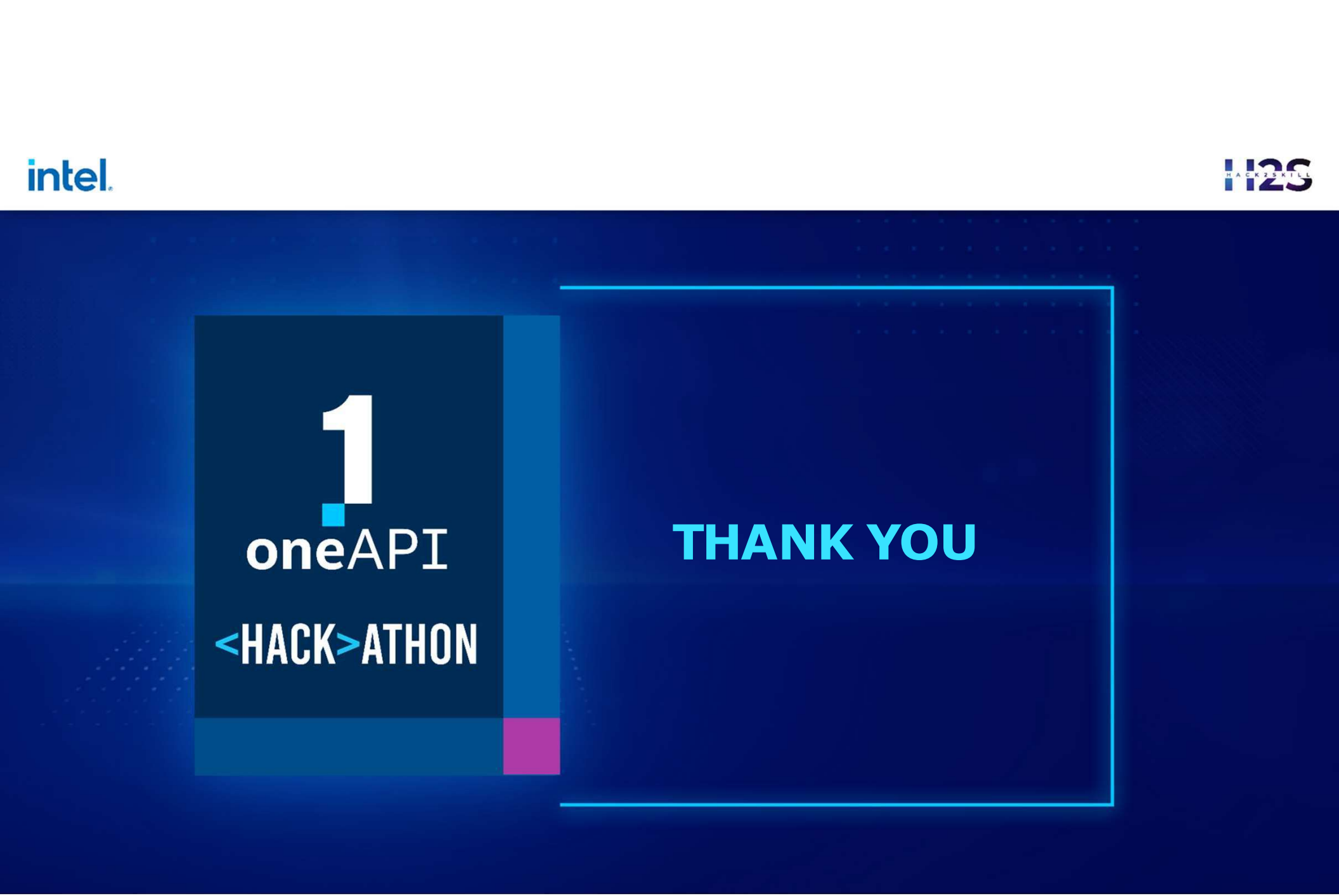
Technologies used

- SYCL/DPC++
- oneDAL
- Camera (30p/20fps)
- OpenCV
- openVINO

Estimated cost of/after implementing the solution

During Implementation:

Database: $150
Camera: $30
Other: $50


intel
H2S
HACK2SKILL
oneAPI
<HACK>ATHON
THANK YOU