2021-6-16	Establish this document	HL
2021-7-8	Update and approval of the training plan	HL and YY

Edge AI Computing Syllabus

Instructors: Harry Li, Ph.D., Yusuke Yakuwa and invited lecturers, Nitin Patil, Chee Vang.

Course Coordinator Contact : Harry Li, Ph.D. Email: hurry.li@ctione.com Mobile Phone: (650) 400-1116

Training Schedule :
Batch Name : Embedded Edge AI Computing
Duration : 2-3 hr per lecture session, 1-2 times/week for 2 and a half weeks
Core Coding Topics:
(1) Development toolchain, e.g., jetpack and OS source distribution for Nvidia embedded platforms, Jetson NANO and Tx2;
(2) OpenCV, Python, TF, Pytorch for Deep Learning with emphasis on IP video streaming and yolo4;
(3) Program/performance profiling, Hardware Architecture, GPU and its optimization;
(4) Cuda Programming and debugging tools.
(5) Unity AI platform, C# and interface to TF and other Deep Learning package.
(6) Mathematical foundation in Deep Reinforcement Learning.

Prerequsite:
Python, full time engineer interns.

Table 1. Course Description (80 words)

Embedded Edge AI computing, Nividia Jetson NANO and Tx2; OpenCV, Python, TF, Pytorch for Deep Learning, IP video streaming, PTZ CAM control, and yolo4; TF Program/performance profiling, Hardware Architecture, GPU and its optimization; Cuda Programming and debugging tools. Unity AI platform, C# and interface to TF and other Deep Learning package. Mathematical foundation in Deep Reinforcement Learning.

Online Lecture Schedule:
W. F. 1:30 – 3:30 pm, Zoom based.

Zoom Credential:
The credential for the Zoom meeting:
https://us05web.zoom.us/j/4593889909?pwd=eWU5RVM3YlBvempkL3owVXE0VVVuUT09

Meeting ID: 459 388 9909
Passcode: iYYeK5

Alternative Zoom link (if the first link is not functioning)
https://zoom.us/j/5019377811?pwd=c0cyeFM0eFMzNmFXOEQyNTc3dEdJUT09
Meeting ID: 501 937 7811

Passcode: ZS8pAz

Homework and Project:
Each lecture session will normally be accompanied by homework assignment and one comprehensive project will be assigned to the class as well.

Outcome: To be able to compile and run the sample code in the training class.

Table 2. Lecture Schedule

Lectures	Topic	Tools	Instructor
0.1	Embedded Edge AI computing, Nividia Jetson NANO and Tx2; OpenCV, Python, TF, Pytorch for Deep Learning		Harry Li
1	IP video streaming, PTZ CAM control, JS and CGI; and yolo4 and implementation case study	OpenCV, TF	Nitin Patil, Yusuke Yakuwa, and Harry Li
2	Hardware Architecture, GPU and its optimization; TF Program/performance profiling.	OpenCV, TF	Harry Li and Yusuke Yakuwa
3	Unity AI platform, C# and interface to TF and other Deep Learning package.	OpenCV, TF	Chee Vang
4	Unity AI, C# and Python Interface		Chee Vang
	Cuda Programming and debugging tools.		Yusuke Yakuwa
5	Mathematical foundation in Deep Reinforcement Learning.	MySQL, MySQL Workbench	Harry Li
6	Smart phone APP for realtime streaming, TF Program/performance profiling on Yolo4 and AIV100.	GitHub/Gitlab	Zhenyu Wang, Yusuke Yakuwa, and Harry Li,

Appendix A. Unity Course Description

In this lecture we are using Unity 3D and ML-Agent to simulate and train a 6 DoF robot arm with a (Deep Reinforcement Learning) DRL algorithm. Then, we'll learn how to create a new Unity project to simulate a satellite's orbital movement.

Appendix B.
(END)