Press Release

ITD Lab Corp.

August 14, 2019

ITD Lab Corporation

ITD Lab. Corporation Joins the Autoware Foundation

- Achieving Excellent Performances of Stereo Camera as a Core Device in Autonomous Driving System -

ITD Lab. Corporation (hereinafter, ITD Lab), Headquarters in Yokohama, Kanagawa, Japan (Takao SHIGAKI, President & CEO and Keiji SANEYOSHI, CTO), is a company for developing ultra-high-performance stereo cameras and selling the licenses of its technologies. Effective August 1, 2019, ITD Lab has joined the Autoware Foundation (hereinafter, the AWF), an international alliance dedicated to establishing industry standards for autonomous driving technology. The AWF is an international alliance jointly established by Tier IV, Inc. (Japan), Apex. AI, Inc. (USA), and Linaro (UK) to develop and spread the autonomous driving open-source software "Autoware" for everyone to use for free of charge. ITD Lab is expected to contribute to the AWF through stereo camera technologies and has been registered to "Premium" membership, the highest membership level in the AWF.

ITD Lab provides stereo cameras detecting the outline of an object with high resolution and automatically calculating the distance to the object at high speed of 60FPS. In addition, all the calculations are performed with a single FPGA chip embedded in each stereo camera. With this configuration, ITD Lab's stereo cameras output high-quality information to an autonomous driving system in real-time, which is incomparably better than LiDAR sensors, on-vehicle monocular cameras, and millimeter wave radars, and act as a power weapon as the "eyes" of a self-driving car system. ITD Lab will establish the excellent performances of its products through the AWF and make a substantial contribution to expansion and growth of the AWF. Mr. Shinpei KATO, Board of Directors of the AWF and Founder CTO of Tier IV, expressed with high expectation to ITD Lab, "Stereo camera is becoming one of essential elemental technologies for autonomous driving system. ITD Lab's stereo cameras have high standard technologies in hardware and software, and we believe the company will make up for missing pieces of Autoware. By collaborating with ITD Lab through the AWF, we would like to lead to higher technology and widespread use of the technology."

Different from “LiDAR sensors having slow response speed with relatively high cost and low spatial resolution” and “on-vehicle monocular cameras not capable of calculating the distance to an object under the situation not available in the models”, ITD Lab’s ultra-high-performance stereo cameras have advantages including “compact in size”, “low power consumption”, “light in weight”, “high responsiveness”, “high-performance object recognition (outline detection)”, and “full calibration” to be an indispensable device in the field of collision avoidance and autonomous driving in autonomous vehicles, drones, construction machines, and industrial robots.

[About ITD Lab]

ITD Lab was founded in May, 2016, by founders including Keiji Saneyoshi, who was an Associate Professor at Tokyo Institute of Technology and is now CTO of this company. Saneyoshi is known as an inventor of “stereo cameras used in Subaru’s EyeSight”. ITD Lab has started research and development of stereo cameras, centering the technologies Saneyoshi has invented and developed.

ITD Lab has set up its head office in Tokyo Institute of Technology Yokohama Venture Plaza (YVP), located in Nagatsuta-cho, Midori-ku, Yokohama, Kanagawa. ITD Lab has Takao Shigaki as President & CEO, four directors, and 15 staff members.

[Features of ITD Lab Stereo Camera]

ITD Lab’s stereo camera is an intelligent system with two image sensors that capture images of an object, which allows to the stereo camera to calculate the distance to the object based on the binocular parallax of the images captured by the two image sensors. The basic algorithm of ITD Lab’s stereo camera employs the sum of absolute difference (SAD), which is also used for “the stereo camera in Subaru’s EyeSight” invented by Keiji Saneyoshi, CTO of ITD Lab. While various other stereo cameras on the market use the semi-global matching (SGM), our stereo camera uses the SAD according to the following reasons:

(1) (Different from the stereo camera using the SGM,) ITD Lab’s stereo camera using the SAD makes the algorithm simple. As a result, our stereo camera requires a small amount of computer power, and significantly reduces the cost, size, and power consumption, regardless of its ultra-high-speed processing at 60 to 160 frames per second.

(2) Compared with the SGM, the SAD enables the stereo camera to render the outline of

an object clearly in a parallax image, which allows us to build up systems for collision avoidance and autonomous driving without using expensive LiDAR sensors.

(3) In addition, ITD Lab's stereo camera is implemented with a high-speed, real-time automatic adjustment function, which has not been achieved even in Subaru's EyeSight technology. According to this automatic adjustment function, our stereo camera provides solutions to the essential problems related to changes over time in mechanical accuracy. For example, even if the assembling accuracy of the stereo camera varies due to temperature change or physical impact, the system of this intelligent stereo camera automatically calibrates and corrects the whole variations through the software.

With these advantages, our stereo camera is applicable to various applications and devices such as autonomous vehicles, industrial robots, construction machines, AGV, and even drones due to the compact size and low power consumption.

[Why Does ITD Lab's Stereo Camera Solve Issues Regarding Autonomous Driving]

In Level 4 or 5 autonomous driving, the system, not a driver, is substantially or fully responsible for avoiding collision and is required to have inexcusably highly accurate collision avoidance performance. According to this fact, it is extremely difficult to achieve autonomous driving at these levels with "LiDAR sensors having slow response speed with relatively high cost" and "on-vehicle monocular camera systems not capable of calculating the distance to an object under the situation not available in the models". In fact, developments of autonomous driving over the world have now reached a standstill and are struggling to make any further progress. However, as described above, ITD Lab's intelligent stereo camera performs the ultra-high-speed processing at 60 to 160 frames per second to determine the outline of an object and the distance information very accurately, which enables the stereo camera to play a role of "another pair of eyes" for autonomous driving and to truly build up autonomous driving system (at Level 4 or Level 5) by combining with Deep Learning AI.

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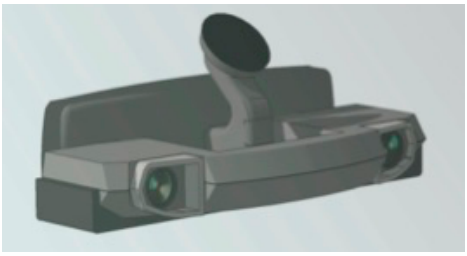

ITD Lab Intelligent Stereo Camera

Autoware

Tier IV Intelligent Vehicle