Press Release

ITD Lab Corp.

June 10, 2020

ITD Lab Corporation

Signed a joint development and sales agreement with Minato Advanced Technologies, Inc. for a compact intelligent stereo camera.

--- Accelerating Stereo Camera Business for AGV, AMR and Small Mobility –

ITD Lab Corp. (hereinafter, ITD Lab; Headquarters in Yokohama, Kanagawa, Japan; Takao Shigaki, President & CEO and Keiji Saneyoshi, CTO), a developer and licensee of ultra-high-performance stereo cameras, has decided to jointly promote the development and marketing of a new compact intelligent stereo camera with Minato Advanced Technologies, Inc. (Headquarters in Yokohama, Kanagawa, Japan; President & CEO: Hitoshi Aizawa).

Through their activities, the two companies have recognized that ITD Lab's stereo cameras are ideal for 3D area monitoring sensors required by automatic guided vehicles (AGVs, AMRs) for obstacle detection. AGVs, AMRs, etc., are increasingly required to have a high level of safety in their operation. Since the market for camera sensors as a solution to this requirement is expected to grow rapidly, we have entered into an agreement for the development and sales of a compact intelligent stereo camera equipped with ITD Lab's stereo camera algorithm to be commercialized as soon as possible. The two companies will jointly invest in development to bring the product to market by the end of this fiscal year, and both companies will also jointly promote sales activities.

Currently, 2-D LiDAR is widely used as an area monitoring sensor for AGVs, but it can only determine whether an obstacle exists in a set 2-D plane. In other words, it never detects obstacles even if they exist outside of the monitored plane. ITD Lab's stereo cameras can expand the monitoring range to three dimensions, which will greatly improve safety when operating AGVs and AMRs. Moreover, the size, weight, and price of the sensor are equivalent to the current 2D LiDAR, so it is expected to be quickly replaced in the market. Furthermore, ITD Lab's stereo cameras output not only obstacle detection signals, but also 3D depth data and the original image from the CMOS sensor simultaneously, making them ideal for Visual SLAM (Simultaneous Localization and Mapping) and AI (Artificial

Intelligence) processing in AGV and AMR.

Compared to "expensive but slow response time LiDAR" and "monocular camera systems that cannot calculate distances for objects that are not modeled," ITD Lab's ultra-high performance stereo cameras have the advantages of "small size," "low cost," "low power consumption," "light weight," "fast response," "high object recognition (contour extraction)," and "fully automatic calibration. Not only for AGV and AMR, but it is also an indispensable device in the field of anti-collision and automatic driving for automobiles, drones, construction machinery, robots, etc.

Minato Advanced Technologies, Inc. is a group company of Minato Holdings Corporation (Headquarters in Chuo-ku, Tokyo; Chairman and President: Takehiko Wakayama; Securities Code: 6822). The group is engaged in the design, manufacturing, and sales of memory modules and other products for industrial equipment applications. Since 2017, it has also been strongly cooperating with ITD Lab on the sales front as its sales agent.

[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, three directors, and 12 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. 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.

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