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ITD Lab Corporation

ITD Lab Obtains Funding through Third-Party Allotment

- Expanding Stereo Camera Business  
in Anticipation of Advanced Autonomous Driving -

On January 18, 2019, ITD Lab Corporation (hereinafter, ITD Lab; Headquarters in Yokohama, Kanagawa, Japan; Takao Shigaki, President & CEO and Keiji Saneyoshi, CTO), developing ultra-high-performance stereo cameras and selling the licenses of its technologies, raised funds through a third-party allotment to Fuji Electronics Co., Ltd. (hereinafter, Fuji Electronics; Headquarters in Tokyo, Japan; Shinichi Onodera, President). ITD Lab has acquired the total amount of 630 million yen by the produced funds through this third-party allotment and by the capital increase in May, 2018, through a third-party allotment to Nissay Capital Co., Ltd. (hereinafter, Nissay Capital; Headquarters in Tokyo, Japan; Tetsuya Adachi, President and CEO), Mitsui Sumitomo Insurance Venture Capital Co., Ltd. (hereinafter, MSIVC; Headquarters in Tokyo, Japan; Hisakazu Ishigami, President), Minato Holdings Inc. (hereinafter, Minato Holdings; Headquarters in Tokyo, Japan; Takehiko Wakayama, President and Representative Director), and Sony Semiconductor Solutions Corporation (Headquarters in Kanagawa, Japan; Terushi Shimizu, Representative Director and President).

Different from “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”, ITD Lab’s ultra-high-performance stereo camera has advantageous features including “compact in size”, “low power consumption”, “light in weight”, “high responsiveness”, “high-performance object recognition (outline detection)”, and “full calibration”, so as to be an indispensable device in the fields of collision avoidance and autonomous driving in autonomous vehicles, drones, construction machines, and industrial robots. Strong demands for advanced stereo vision have been increasing recently from these fields. In order to timely respond to such demands, ITD Lab has often been expected to further accelerate the research and development of our new technologies. The funding raised this time through the third-party allotment is mainly applied to recruiting and retaining excellent human resources

responsible for our research and development, maintenance of research environment, and promotion of large-scale development involving outside development corporations and companies. In such ways, ITD Lab reliably responds to the above-described expectation and needs in the fields using the stereo vision technologies.

Fuji Electronics has agency contracts with ITD Lab. With ITD Lab's high-performance stereo camera technologies, Fuji Electronics expedites the development and support of next-generation applications in cooperation with AI+IoT and Maas businesses that are carried out by its group company and the appropriate proposals of system solutions.

Nissay Capital and MSIVC, which are carefully selecting and actively inventing in venture companies with originality and innovativeness, support ITD Lab continuously from April 2017, from the seed stage in the funding in anticipation of possibilities of ITD Lab's stereo camera technologies in autonomous driving and collision avoidance.

Minato Holdings, which is a leading company for industrial memory modules, device programmers, ROM writing services, and display solutions, has found great potential in our stereo camera technologies soon after the startup of ITD Lab., and entered into the agreement in 2017 to work with ITD Lab over a wide area of businesses. Minato Holdings develops, produces, and commercializes products with high technical strength to promote business of the products together with ITD Lab and, at the same time, powerfully collaborates with ITD Lab in sales as a sales agent of stereo cameras released by ITD Lab.

[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. 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 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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