



Bosch and INCREMENT P CORPORATION agree to work together on creation of high-resolution maps for automated driving

Radar Road Signature enables reliably determining vehicle location via radar sensors

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Bosch
Increment P

- ▶ A significant step towards realizing high-resolution maps for automated driving
- ▶ Robust determination of a vehicle's location in a lane within a few centimeters
- ▶ This partnership expands Bosch Road Signature's global footprint into Japan

Tokyo — Bosch, a leading global supplier of technology and services, has reached an agreement to cooperate with INCREMENT P CORPORATION, map provider and Pioneer's wholly owned subsidiary, in the field of high-resolution maps, utilizing on-board sensors for automated driving.

Bosch Road Signature: provides reliable vehicle position within a few centimeters

To realize automated driving, vehicles need to have exact location information at all times. To this end, Bosch is currently working on development of Bosch Road Signature, a vehicle localization technology that utilizes on-board camera and radar sensors. Data collected by the on-board vehicle sensors is sent to Bosch's cloud servers to continually update the localization layer. This localization layer is then integrated into high-resolution maps created by partner companies. To determine their location, automated vehicles compare video and radar sensor data of their surroundings to corresponding information from the localization layer.

With Bosch's Radar Road Signature, a vehicle localization technology based on radar, a vehicle's exact location can be determined to within a few centimeters. In contrast to on-board camera based localization technology, it can determine a location even in conditions of poor visibility, such as at night or while raining.

The volume of data that must be transmitted to the cloud can also be kept lower than with camera-based maps.

Japan partnership in high resolution maps for automated driving

Bosch currently cooperates with major map providers in North America, Europe and China to develop the high-resolution maps for automated driving utilizing Bosch Road Signature. This time, as part of the cooperation with INCREMENT P, Bosch will provide Radar Road Signature localization layer data to INCREMENT P, and INCREMENT P will create maps for automated driving integrating Radar Road Signature localization layer. The president of Bosch Corporation's Chassis Systems Control Division in Japan, Lutz Hillebold, stated, "I am very happy that we have partnered with INCREMENT P, a leading map provider in Japan. Establishing a partnership in Japan is a major milestone in providing Bosch Road Signature to automakers globally. This partnership should further accelerate Bosch's development of automated driving in Japan."

President and CEO of INCREMENT P CORPORATION, Takumi Jinguji, stated that, "cooperating with partners is indispensable for creating and updating high-precision maps for automated driving. To realize automated driving, reliable vehicle localization is a challenge which requires a suitable relationship between various sensor data fusion technologies and maps. We look forward to solving this issue through our partnership. And we hope to contribute to realizing and popularizing automated driving by strengthening development of high-resolution maps for automated driving."

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INCREMENT P CORPORATION

Since its founding in 1994, INCREMENT P has focused on 'maps as digital media,' utilizing our core technologies such as software technology and high-quality digital map creation technology to develop creative products and services and provide solutions, across a range of genres. Through dynamic processing of multidimensional and multifaceted data, based on spatial information, INCREMENT P continues to revolutionize the utility of maps and positioning data.

Bosch group in Japan

Bosch in Japan is currently represented in the country by Bosch Corporation, Bosch Rexroth Corporation, Bosch Packaging Technology K.K. and other affiliates. Bosch Corporation is responsible for the development, manufacturing, sales and services of automotive original equipment, automotive aftermarket products and power tools. Bosch Engineering K.K. provides engineering services, such as development and application for automotive systems. ETAS K.K. develops and provides engineering of development support tools of electrical control units. Bosch Rexroth Corporation develops and manufactures hydraulics, FA module components and other systems which contribute to industrial technologies. Bosch Packaging Technology K.K. provides processing, packaging and inspection technology. Bosch Security Systems Ltd. provides security and communication products and solutions to help secure the safety of lives, buildings and properties, and is also a supplier of professional sound systems. In 2016, Bosch

Japan achieved sales to third party of some 267 billion yen and employed approximately 6,600 associates.

Additional information is available online at

<http://www.bosch.co.jp> Bosch Japan Website (Japanese)

<https://twitter.com/BoschJapan> Bosch Japan Twitter (Japanese)

<https://www.facebook.com/bosch.co.jp> Bosch Japan facebook (Japanese and English)

<https://www.youtube.com/boschjp> Bosch Japan Youtube (Japanese)

Bosch group worldwide

Mobility Solutions is the largest Bosch Group business sector. In 2016, its sales came to 43.9 billion euros, or 60 percent of total group sales. This makes the Bosch Group one of the leading automotive suppliers. The Mobility Solutions business sector combines the group's expertise in three mobility domains – automation, electrification, and connectivity – and offers its customers integrated mobility solutions. Its main areas of activity are injection technology and powertrain peripherals for internal-combustion engines, diverse solutions for powertrain electrification, vehicle safety systems, driver-assistance and automated functions, technology for user-friendly infotainment as well as vehicle-to-vehicle and vehicle-to-infrastructure communication, repair-shop concepts, and technology and services for the automotive aftermarket. Bosch is synonymous with important automotive innovations, such as electronic engine management, the ESP anti-skid system, and common-rail diesel technology.

The Bosch Group is a leading global supplier of technology and services. It employs roughly 390,000 associates worldwide (as of December 31, 2016). The company generated sales of 73.1 billion euros in 2016. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. As a leading IoT company, Bosch offers innovative solutions for smart homes, smart cities, connected mobility, and connected manufacturing. It uses its expertise in sensor technology, software, and services, as well as its own IoT cloud, to offer its customers connected, cross-domain solutions from a single source. The Bosch Group's strategic objective is to deliver innovations for a connected life. Bosch improves quality of life worldwide with products and services that are innovative and spark enthusiasm. In short, Bosch creates technology that is "Invented for life." The Bosch Group comprises Robert Bosch GmbH and its roughly 440 subsidiaries and regional companies in some 60 countries. Including sales and service partners, Bosch's global manufacturing and sales network covers nearly every country in the world. The basis for the company's future growth is its innovative strength. At 120 locations across the globe, Bosch employs some 59,000 associates in research and development.

Additional information is available online at www.bosch.com, www.iot.bosch.com, www.bosch-press.com, www.twitter.com/BoschPresse.