2nd Executive Forum on LiDAR for Automotive
PROGRAM
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Yole Développement

Guillaume Girardin

Division Director, Photonics, Sensing and Display

Guillaume Girardin, PhD is Director of the Photonics, Sensing & Display Division at Yole Développement, part of Yole Group of Companies. As director he also performs several technical activities covering sensing technologies, including solid-state lighting & display, MEMS, sensors, actuators, imaging, photonics and optoelectronics fields.

Based on his valuable experience in the semiconductor industry, Guillaume manages the expansion of the technical and market expertise of his team, by increasing synergies around imaging, lighting and display, and enlarging the optoelectronics scope. The team interacts daily with leading companies allowing the analysts to collect a large amount of data and integrate their understanding of the evolution of the market with technology breakthroughs. In parallel, Guillaume's mission is focused on the management of business relationships with leaders of the industry and the development of market research and strategy consulting activities within the Yole Group.

Dr Girardin holds a Ph.D. In Physics and Nanotechnology from the Claude Bernard University Lyon 1 (Lyon, France) and an M.Sc. in Technology and Innovation Management from EM Lyon School of Business (Lyon, France).

LiDAR Sensors for mobility

Along with electric vehicles, autonomous driving is the next big thing for the automotive industry. Last year, we saw Waymo launch its robotic car service in Phoenix, Arizona. The Waymo cars use five LiDARs, among cameras, radars, and GPS, to orient themselves in the streets. In 2017, Audi released the first commercial passenger car integrating a LiDAR. The LiDAR, provided by Valeo, is an option for the A8. And now, BMW in a partnership with Magna and Innoviz, an Israeli LiDAR company, is preparing for mass-production of automotive LiDARs with release scheduled in 2021. The LiDAR is expected to use MEMS technology.

Once limited to scientific and spatial applications, there is no doubt that LiDARs are profoundly impacted by the automotive industry today. This impact is expected to result in a market growth from $216M in 2018 to $4.2B in 2024 for automotive LiDARs. It will also result in smaller and cheaper LiDARs which will reach new applications in logistics, manufacturing, and smart buildings.

Valeo

Dr. Jianmin GU

China Chief Technology Officer

Dr. Jianmin Gu joined Valeo Group in January 2018, serving as Valeo China Chief Technology Officer.

From 2013 to 2017, he was R&D Director at Volvo Car Asia Pacific and in charge of vehicle engineering, active safety and chassis, cost management, strategy, advanced engineering and concept development related areas.

Between 1997 and 2013, he had various leadership positions at Mechanical Dynamics, Inc., Ford Motor Company in the U.S. and Changan Automobile Company, Ltd, managing vehicle attributes, chassis and computer aided engineering related research and development.

Jianmin Gu holds a Ph.D. in Mechanical Engineering and an MBA, both from the University of Michigan in the U.S. He is also Adjunct Professor at Chongqing University and Adjunct Research Fellow at Shanghai Jiao Tong University.

Valeo SCALA® – The world's bestselling 3D laser scanner

About 1.5 years after its market introduction the Valeo SCALA® is still the world's only 3D laser scanner compliant with the industry's fierce specifications for automotive volume production regarding product design, validation, manufacturing and not least cost.
With more than 100,000 units shipped it is also the world's bestselling 3D laser scanner.
Its unique perception capabilities combining a long detection range, a wide field of view, high resolution and accuracy, and high update rate remains being the benchmark for automotive LiDAR applications.
Valeo will launch the 2nd generation of its SCALA® laser scanner with further improved perception capabilities in 2020.

System Plus Consulting

Romain Fraux

CEO

Romain Fraux is the CEO of System Plus Consulting (part of our Yole Group of companies), that focuses on Reverse Costing analysis of electronics, from semiconductor devices to electronic systems.

Supporting industrial companies in their development, Romain and his team are offering a complete range of services, costing tools and reports. They deliver in-depth production cost studies and estimate objective selling price of a product, all based on a detailed physical analysis of each component in System Plus Consulting laboratory.

Romain has been working for System Plus Consulting for more than 12 years and was previously the company's CTO.

He holds a bachelor's degree in Electrical Engineering from Heriot-Watt University of Edinburgh (Scotland), a master's degree in Microelectronics from the University of Nantes (France), France and a Master of Business Administration.

Automotive LiDAR: Physical & cost review of actual solutions and future evolutions

LiDARs are now on the roads. Short range LiDAR are already installed since few years, like Continental SRL products. Last year, Audi was the first automaker to introduce a commercial car, the Audi A8, with a long-range LiDAR. The system was developed via the partnership between Valeo and Ibeo.

Based on pictures extracted from teardown and physical analyses of LiDAR from Continental, Valeo or LeddarTech, the presentation will highlight the latest trends and the evolutions in term of system integration and components choices.

Innoviz Technologies

David Oberman
VP Sales

David joined Innoviz as VP Sales in December 2017, and is currently building Innoviz's sales and technical team, as well as establishing partnerships worldwide with automotive Tier1s and OEMs, and distribution partners.

Prior to joining Innoviz, David was Director of Sales at Mobileye, an Intel company, for over 9 years, leading a team of 21 sales managers and technical support engineers in Israel and worldwide. Sales of Mobileye's Advanced Driver Assistance Systems (ADAS) worldwide grew from scratch in 2008 to over $80M in 2016. Before Mobileye, David managed sales at RAD Data, the leading Israeli manufacturer of communications equipment; at TransChip, the company which made the world's first System-On-Chip camera for cellphones (TransChip was sold to Samsung); and at other Israeli high-tech companies, and for ten years was CEO of Israel Japan Enterprises. David served in the Israeli paratroops brigade. After BA and MA studies in East Asian studies at the Hebrew University of Jerusalem, David received a Japanese government "Mombusho" scholarship and spent 2 years studying at Hokkaido University, Japan.

David lives in Jerusalem with his wife Yael, a Doctor of Psychology and their dog, Ginger, and enjoys travel, sports and reading.

Mass Commercialization of Solid-State LiDAR

Innoviz's automotive-grade sensor, Innoviz One, is leading the way in providing outstanding 3D perception for the mass production of partially and fully-automated vehicles. InnovizOne is solid-state, with no mechanical moving parts unlike other spinning sensors on the market, allowing for a more compact and cost-effective design. Its design is also the product of close collaboration all across the automotive industry. Rather than focusing on bringing quick solutions to market, Innoviz chose an ambitious path of developing a product designed to meet the requirements for automotive series production through partnerships with Tier 1 suppliers HARMAN, Aptiv, HiRain and Magna, as well as automaker BMW. InnovizOne and Innoviz's perception software are poised to be included in BMW's first generation of autonomous vehicles in 2021- the first deal of its kind! David Oberman, Innoviz's VP Sales, will discuss how the LiDAR industry is moving towards solid-state and plans to bring mass producible LiDAR to car manufacturers. He'll also explain why collaborating with the automotive sector is essential for LiDAR companies to expand production, reduce costs and deliver solutions that meet the industry's stringent safety requirements.

Suteng Innovation Technology Co. Ltd. (The RoboSense LiDAR)

Dr. -Ing. Leilei Shinohara
Vice President & CoPartner at RoboSense LiDAR

Dr. Leilei Shinohara joined RoboSbense in January, 2019. From 2015 to 2018, he was the Technical Lead, Asia OEMs at Valeo, and was responsible for automotive LiDAR, automotive active safety products, and sensor fusion. He has managed a team in six countries, responsible for developing systems, software, hardware, mechanics, testing/validation, and functional safety for the first automotive grade LiDAR product "Valeo Scala".

In 2008, Dr. Shinohara began his PhD studies at Karlsruhe Institute of Technology in Germany, and received his PhD degree in Electrical and Electronics Engineering in 2014. During six years of PhD studies, Shinohara focused on LiDAR systems and was involved in sensor projects, including optical sensor analogue and design, optical quality measurement, Doppler LiDAR, and 3D MEMS micro-mirror LiDAR for autonomous driving. As a project leader and the chief engineer, Dr. Shinohara and the team has developed an advanced LiDAR system which was later acquired by a German Tier 1 company.

RoboSense Smart LiDAR Sensor System for ADAS & AD

In the environment perception of autonomous driving, the sensor hardware usually only takes the job of data collection, while smart perception algorithms will further analyse the data and abstract useful information for the autonomous driving system. Mobileye, with their advantages in smart image recognition algorithms, has persuaded most of the OEMs to choose their product instead of the conventional front cameras supplied by Tire 1s, and eventually the EyeQ has taken huge market shares. Although Valeo's Scala has only got 4 laser beams, but Audi still chose their system solutions. The rigid demand and various cases has exposed the core needs dimmed by the aura of LiDAR hardware development: Instead of an information "Collector", autonomous driving needs a smarter information "Interpreter". RoboSense distinguishes itself from conventional LiDAR hardware supplier through developing and providing the market with smart Sensors by combining critical technologies in LiDAR hardware, AI point cloud algorithms and chips. The mass production version of RoboSense's RS-LiDAR-M1 will be a smart sensor, which will directly output reliable target level environment perception results.

RoboSense's VP of R&D, Dr. Leilei Shinohara will focus on the LiDAR sensor requirements of mass production passenger cars to give opinions on the technical trends of the automotive grade LiDAR sensors, as well as the necessity of making them smart. Meanwhile, he will give details on the advantages of MEMS solid-state LiDAR systems in fulfilling mass production, low cost, and stringent safety requirements.

First Sensor AG

Uwe Wielsch

Sales Director Asia

Uwe Wielsch is Sales Director Asia for First Sensor, a leading supplier of sensor solutions. In his current position he is driving the LiDAR business of First Sensor in Asia, one of the key markets for this application. In previous high level sales and product management roles he worked for On Robot, Optoforce, Jenoptic and FSME Ltd, always with a technical focus on Optics and Optoelectronics. Prior to that, at Sentech Instruments, he worked in product management and R&D roles on thin film deposition technologies. He received his Physics Degree from the University of Berlin.

LiDAR receivers for Automotive Applications

A key component to ensurA key component to ensure automotive LiDAR reliability and functionality is the sensor— the "eyes" of the LiDAR system. Viable sensor solutions for this application need to bring together performance, quality and reliability but also appropriate cost and scalability. First Sensor presents the challenges of designing LiDAR receivers for automotive applications and proposes the according detector architecture based on silicon avalanche photodiodes including the packaging platform for high integration density LiDAR receivers. Specific design considerations are discussed regarding functionality and reliability of the sensor and an outlook is given on pushing the limits of silicon APDs.e automotive LiDAR reliability and functionality is the sensor— the "eyes" of the LiDAR system. Viable sensor solutions for this application need to bring together performance, quality and reliability but also appropriate cost and scalability. First Sensor presents the challenges of designing LiDAR receivers for automotive applications and proposes the according detector architecture based on silicon avalanche photodiodes including the packaging platform for high integration density LiDAR receivers. Specific design considerations are discussed regarding functionality and reliability of the sensor and an outlook is given on pushing the limits of silicon APDs.

TRIOPTICS GmbH

Simon Zilian

Lead of Sales

Simon Zilian received an physical engineering degree at the University of Applied Sciences Wedel. After gaining experience in the area of laser cutting and welding, he joined TRIOPTICS 14 years ago.
Starting in the fields of production, application support and sales, he more and more focused on the latter. Now he acts as head of international sales as well as member of the

From camera to LiDAR systems alignment and testing in mass production of ADAS sensors

Trioptics has gained broad experience from assembly, alignment and testing of camera systems for ADAS application in automotive production lines. These capabilities are applied to help achieving high quality and yields in the industrial production of LiDAR systems. Starting from the most recent achievements in camera production, the presentation will outline how an industry proven alignment process and algorithm is transferred to the automated production of LiDAR systems. The latest developments in the alignment of laser projection systems in scanning and non-scanning configurations and with wavelengths in the NIR range are described. This includes the testing and qualification of objective lenses for laser beam projection.

The presentation will describe in depth the alignment process of the optical system to match the desired illumination pattern. During the active alignment process the laser, encapsulated in a laser-safe process camber, is powered to continuously analyze the structured light of the laser beam pattern. The laser PCB is automatically adjusted in 6 DOF relative to the projection lens to hit the required intensity distribution at a camera system focused to infinity. The required intensity profile across the projection area is achieved by the alignment machine under closed-loop control by a novel image processing algorithm.

The algorithm continuously calculates the contrast at defined regions of interest (ROI) across the laser beam pattern while the lens position and tilt are controlled by an automated manipulator. The results show how the application/customer specific contrast modulation and intensity profile pattern requirements are achieved within seconds while preventing vignetting and assuring boresight centering simultaneously.

Trioptics continues to expand its competences with the recent development of a new state of the art LiDAR alignment module. Besides Active Alignment technology, a new approach of Passive Alignment is developed to analyse and align LiDAR detector and emitter modules like SPAD, APD or VCSEL.