



Machine Vision & IR for Industry Forum

PROGRAM

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Yole Développement

Dimitrios Damianos

Technology & Market Analyst, MEMS, Sensors, Photonics & Imaging

Dimitrios Damianos, PhD joined Yole Développement (Yole) as a Technology and Market Analyst and is working within the Photonics, Sensing & Display division.

Dimitrios is daily working with his team to deliver valuable technology & market reports regarding the imaging industry including photonics & sensors.

After his research on theoretical and experimental quantum optics and laser light generation, Dimitrios pursued a Ph.D. in optical and electrical characterization of dielectric materials on silicon with applications in photovoltaics and image sensors, as well as SOI for microelectronics at Grenoble's university (France).

In addition, Dimitrios holds a MSc degree in Photonics from the University of Patras (Greece). He has also authored and co-authored several scientific papers in international peer-reviewed journals.

Alexis Debray

Technology & Market Analyst, MEMS, Sensors & Photonics

Alexis Debray, PhD is a Technology & Market Analyst, Optoelectronics at Yole Développement (Yole). As a member of the Photonics, Sensing & Display division, Alexis is today engaged in the development of technology & market reports as well as the production of custom consulting projects dedicated to the imaging industry.

After spending 2 years at the University of Tokyo to develop an expertise focused on MEMS technologies, Alexis served as a research engineer at Canon Inc. During 15 years he contributed to numerous projects of development, focused on MEMS devices, lingual prehension, and terahertz imaging devices.

Alexis is the author of various scientific publications and patents. He graduated from ENSICAEN and holds a PhD in applied acoustics.

Machine Vision and IR for the industry in a moving world

As the world has entered a new era of social and physical distancing, monitoring and imaging systems are becoming even more crucial to our society, and it is even more true in what is broadly known as the industrial domain. Machine Vision which is already a key component of manufacturing and logistics is expanding in new territories such as smart farming, autonomous transportation and mobility, smart offices, and smart cities. New technologies are on the verge of revolutionizing the interactions of humans and their environment: 3D sensing, hyperspectral imaging, and event-based imaging. Similarly, uncooled thermal cameras are becoming key for machines to detect humans. The market reached 1.5M units and more than \$4B in revenue in 2019. During the COVID-19 crisis, it appeared as an important tool to monitor people's temperature and was implemented in numerous sites. It is also a key sensor for autonomous vehicles and has been chosen by numerous players such as GM Cruise, Veoneer, and Nuro to name a few. However, the automotive developments might slow down due to COVID-19. Nonetheless, the general thermal camera market is expected to get a big boost due to its adoption in various infrastructure for fever detection, and according to one of our aggressively optimistic scenarios, it could reach more than \$7B in 2020. Our preliminary scenarios and results on COVID-19 impact will be presented during this forum.

Teledyne e2v Asia Pacific Limited

Jason Yang

China Sales Manager, Professional Imaging

Jason Yang has been a Sales Manager at Teledyne e2v since 2013. With 15 years of experience in automation, machine vision and CCD/CMOS products, Jason has deep insights in the relevant application markets and great practical experience in providing total solutions from device to system.

Intelligent image sensors - The next challenges of Machine Vision

The 4th industrial revolution is on its way with the recent emergence of so-called "smart factories" all over the world. These smart factories use Cyber Physical Systems (CPS) such as vision systems to provide the accurate, complete and real-time information they need. Machine Vision, as an essential provider of information inside factories, will be a key enabler of this new revolution. In this keynote, Jack will present the challenges Machine Vision has to overcome to enable this 4th industrial revolution and how new image sensor technologies will help to tackle these challenges.

Gpixel Changchun OptoTech Inc.

Hongnan Guo

Marketing Manager

Hongnan Guo is the marketing manager of Gpixel. He joined Gpixel in 2017 after graduated from University of Rochester with master degree of material science, and working as product manager role for industrial application product GMAX and GL series. He has extensive understanding on manage the industrial grade CIS product from prototype to production stage, and solid knowledge on CIS structure, processing and technology advancement.

Technology advancements for high end industrial CIS

Gpixel will present the most recent technology developments on high end CIS product addressing industrial application markets. In particular the development of charge domain global shutter pixel and the adaptation of specific technologies developed for CIS consumer products and niche market, such as low noise imaging, backside illumination (BSI), wafer stacking, High Dynamic Range imaging, NIR sensitivity enhancement etc.

System Plus Consulting

Sylvain Hallereau

Senior Technology & Cost Analyst

Sylvain Hallereau has been Project Manager at System Plus Consulting since 2000. He is in charge of costing analyses for Integrated Circuits, Power semiconductors and LEDs. He has significant experience in the modeling of manufacturing costs for electronics components, Sylvain holds a Master degree in Microelectronics from the University of Nantes, France.

Uncooled IR imagers: Structural and cost review of low-cost solutions

Over the last 10 years, more and more uncooled infrared (IR) imaging manufacturers had launched their products for the industrial and now consumer markets. A rapid price erosion occurred with the arrival of new players like Seek Thermal, Guide Infrared, IRay Technology. Consistent sales growth is expected, with new technologies like augmented reality and ADAS, potentially opening a new world of opportunities. However, this will only be possible if a significant cost reduction of the camera module is realized.

To realize this cost reduction, technological innovation is crucial. FLIR is actually driving this innovation with its LETPTON camera cores, mixing fine pixel architecture (12 μ m), wafer-level packaging (WLP) and wafer-level optics (WLO) and low definition die. But the other actors follow closely.

To highlight the last technologies trends, we will make a technological and cost review with comparison of several low-cost thermal cameras. With photos taken from our physical analyses, we will describe and compare the design and manufacturing construction of thermal cameras coming from the main players.

Wuhan Guide Infrared

Wendy Wang

Marketing Director

Ms Wendy Wang, Marketing Director of Wuhan Guide Infrared Co., Ltd, has over 15 years' experience in the thermal imaging industry.

She has been the Sales Director for Overseas Market and responsible for leading the sales team to explore the global market to achieve the sales goals, and imported infrared detectors as well.

Now she is mainly in charge of the marketing management and making strategic decisions on marketing for the Company.

Applications and Development of Infrared Thermography in the Post COVID-19 Era

As the COVID-19 pandemic spreads globally, the Infrared Thermal Imaging Systems have played a critical role in keeping people safe from the epidemic, which leads to the surge demand for thermal imaging systems related to fever monitoring. Currently, more and more thermal imaging systems have been deployed in various public places such as airports, train terminals, metro stations, hospital, office buildings, shopping centers, schools and more.

The surged demand for thermal imaging systems in COVID-19 has a big impact on the thermal imaging industry and increases global awareness of power of infrared thermography. Besides the fever detection, thermal imaging products are also widely used for industrial inspections, law enforcement, automotive, security, personal vision, consumer electronic and more.

Since the outbreak in Wuhan in January, 2020, the city was locked down and most business and factories have been closed. Being a factory in Wuhan, thanks to Guide's self-developed WLP thermal imaging detectors and excellent supply chain resources, Guide Infrared was working hard to fulfill the surge order under the circumstance of shut-down of Wuhan and provide tens of thousands of IR Fever Warning Systems (An Intelligent Thermal Imaging Systems for Fever Screening) for global market.

Backed by 20 years' experience in thermal imaging industry, Guide Infrared developed and now is running 3 self-independent thermal detector production lines: 8-inch 0.25 μm MEMS production line for uncooled VOx detectors, 8-inch 0.5 μm production line for cooled MCT detectors and 8-inch 0.5 μm production line for cooled T2SL detectors, featured with Versatile package method, Various resolution format and different pixel size such as 25 μm 、17 μm 、12 μm . The annual yield capability can be up to millions pieces. And the development and mass production of WLP (wafer level package) detectors help to achieve high yield, low cost, small size and low power consumption.

Guide's thermal imaging detectors have been widely used in thermography, security & surveillance, personal vision, automotive, smart building, AI, IoT etc. The mass production capability of Guide Infrared enables it to meet the growing demand from all existing and emerging markets.

Umicore Electro Optic Materials

William Gao

Commercial and Business Development Manager

William Gao concluded his academic studies with the award of a PhD in Microelectronics and Solid State Electronics from the Shanghai Institute of Technical Physics, Chinese Academy of Sciences. He joined Umicore in 2012 and has worked for several Business Units in Sales and Business Development roles. He is currently responsible for Sales and Business Development of all Germanium based products for Umicore in China, with a particular focus on Infrared Optics.

Wafer Optics for High Volume Thermal Imaging

The last years have seen a rapidly increasing demand for small footprint thermal imaging cameras. The demand is from the introduction of thermal cameras into consumer products and this comes with a very demanding price point. With current, state of the art technology, this is only possible with low pixel count and small pixel pitch detectors. The result is a demand for short focal length, small footprint lenses and lens assemblies. Umicore's Tessella™ wafer manufacturing process provides a solution to this need for small, high volume, cost effective optics.