Conference Agenda
M1 Concourse, Detroit, MI

Conference Day 1 – Wednesday May 24

Welcoming remarks and opening session

8.00   Registration and Refreshments

8.45   Introduction from the CoChairs
        Robert Stead, Managing Director, Sense Media Group
        Prof Patrick Denny, Senior Expert, Valeo Vision Systems

9.00   The changing dynamics in the autonomous vehicle space
        o   Review of M&A activity
        o   5 key trends in the autonomous vehicle technology market
        o   What to expect in the next decade?
        Rudy Burger, Managing Partner, Woodside Capital

The Importance of Testing and Quality in Automotive Perception

9.30   Advanced approaches to autonomous vehicle testing
        o   Are dedicated test facilities relevant to developing high level automation?
        o   Making optimum use of existing test facilities for testing ADAS & automated features
        o   What are the ideal features of a test site for ADAS and autonomous vehicles?
        o   How can OEMs supplement conventional testing methods with virtual testing tools?
        Tim Dawkins, Autonomous Car Specialist, SBD

10.00   What can component and system manufacturers do to guard against liability from out-dated laws?
        o   Understanding the current legal framework and risks – in some cases you can be exposed to
            absolute liability
        o   Liability rules for component manufacturers – who is on the hook for design decisions made at
            the system level?
        o   How the industry can work to solve these (legal) problems
        Todd Benoff, Partner - Products Liability Practice Group, Alston & Bird

10.30   Morning refreshments

11.10   Image quality and safety in automotive video applications
        o   Understanding automotive image quality requirements
        o   Image quality as a pillar for safety-critical applications
        Dr Marc Geese, Chassis Systems Control, Hardware Optics, Robert Bosch

11.40   P2020 – Establishing Image Quality Standards for Automotive
        o   The need for image quality standards
        o   Progress with P2020 to date – challenges for the automotive sector
        o   Key issues identified relating to how industry views image quality
        o   Working towards the main objective – driver and passenger safety
        Prof Patrick Denny, Senior Expert, Valeo Vision Systems

12.10   Lunch is served for all speakers and delegates

Visual Spectrum Imaging Technology and Development

1.30   Challenges in automotive image quality testing
- Review the challenges for human observers and/or machine vision algorithms to resolve low-contrast objects over a wide range of background brightness
- How to distinguish low contrast patches over the full dynamic range of a test chart
- Comparing the use of hyperbolic wedges in ISO16505 vs. slanted edges to measure MTF10 in automotive applications
- Misunderstandings about low contrast slanted-edges

Dr Norman Koren, CTO, Imatest

2.00   Optimizing Imaging and Vision Systems for Autonomous Driving
- Exploring an end-to-end optimization approach to solve design and robustness issues for end-to-end imaging and vision systems
- Formulating data-driven design goals for imaging and vision systems, to automatically optimize a vision and imaging system holistically
- How to tune fixed function ISP and classical vision blocks, optimizing over a vast set of hyperparameters
- How to achieve better image quality in low-light imaging

Felix Heide, Chief Scientist, Algolux

Intelligent Image Processing Systems

2.30   Challenges in ADAS & Autonomous Driving Solutions - From System and Software Architecture Perspective
- System Architecture - H/w Choices, Power Constraints, Partitioning and mapping of functionality/algorithms, Scalability and Safety, Testing, Validation and Simulation
- Software Architecture - OS, Hypervisor and Software Stack, Real-time behavior, Resourcing, Scheduling/Sequencing & Determinism, Software Scalability, Software Integration, Software Safety, Software Verification

Venugopala Madumbu, Software Architect, Automotive Software BU, NVIDIA

3.00   Sensor and ISP for image quality experience
- Camera system from sensor to ISP
- HDR, smaller pixel, higher sensor resolution as a new image quality level in automotive

Gregory Roffet, Senior MTS & Technical Leader on HDR Automotive Camera System, STMicroelectronics

3.30   Afternoon refreshments

4.10   What will it take to bring DNN to Embedded Applications?
- Optimisation of the network architecture
- Optimisation of the problem definition
- Minimize the number of bits needed to represent the network
- Utilize optimized hardware designed to implement deep learning at the lowest power

Michelle (Xuehong) Mao, Principal Design Engineer, Cadence Design Systems

4.40   Overcoming the challenges of integrating AI into ADAS
        Benoit Dupont de Dinechin, CTO, Kalray

5.10   Improving signal to noise ratio in online technology research
        o   Need to ask the internet? You can do better than Google
        o   The Resume of Mario: An advanced, automated, keyword and topic analysis assistant
        o   Identifying the 'need-to-know' from all the patents, publications, products, investors and startups/companies in the autonomous space
        o   The power of influence – connecting the dots among the data
        o   Topical semantic analysis of the technology needs of the AutoSens community
        Dr Lucky Gunasekera, CEO, MISO

5.40   Closing remarks from the CoChairs

6.30   Grand Evening Reception
        Henry Ford Museum, Greenfield Village, Detroit

AutoSens

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Conference Day 2 - Thursday May 25 2017

8.00   Registration and Refreshments

8.45   Introduction from the CoChairs
         Prof Patrick Denny, Senior Expert, Valeo Vision Systems
         Dr. Sven Fleck, Managing Director, SmartSurv

Autonomous Vehicle Design Considerations

9.00   The evolution of imaging technology past and future and the expected challenges
         o   Imaging and how it has improved in performance in the past
         o   Future prediction based on past performance
         o   Technical hurdles to above
         Joel Gibson, Vice President, Product Line and Program Management, Magna Electronics

9.30   The evolving sensor and processing ecosystem – perception, behavior, and control stack
         o   Pulling it all together – key component technology trends in the autonomous space
         o   The evolving ecosystem – segmentation of perception, behavior, and control stack
         o   Identifying the gaps – unfulfilled technology requirements
         Phil Magney, Founder, Vision Systems Intelligence

10.00   How to build an autonomous car
         o   How difficult is it really? From fly-by-wire to autonomy in 5 easy steps
         o   System requirements – sensors and connectivity
         o   Enabling innovation via customer build R&D platforms
         o   Designing the user engagement / disengagement interface
         o   Remaining challenges with self-driving cars
         Paul Fleck, President, DataSpeed

10.30   Morning refreshments

Safety, Design and Performance as Core Principles

11.10   Applying ISO 26262 to ADAS and Automated Driving
         o   Update on ISO26262 working group
         o   What is and is not applicable
         o   Illustration via case studies of different ADAS and automated driving system
         o   Is ISO 26262 applicable to machine learning?
         o   Perspective on future developments for functional safety in automotive
         Dr Riccardo Mariani, Fellow – Functional Safety, Intel

11.40   Design space exploration and code synthesis for high performance high assurance sensor processing
         o   Performance optimization, algorithmic tuning and choice of the right hardware are tightly
               entangled
         o   Aggressive design space exploration can lower cost and provide capabilities in the smallest
               possible form factors and power envelopes

       o   Recent progress in automation makes this possible at a fraction of the traditional effort, while attaining correctness guarantees

Dr Franz Franchetti, CTO and Co-Founder, SpiralGen, and Associate Professor in the Department of Electrical and Computer Engineering, Carnegie Mellon University

12.10   Customer Experiences of Driver Assistance – Are we designing robots for engineers or cars for customers?
Carl Anthony, Managing Editor, Automoblog

12.40   Lunch is served for all speakers and delegates

Starting Grid Showcase

1.40   3 minute pitches from our start-ups, followed by Q&A:
Hao Xin, Lunewave
Richard Baverstock, Mogol

Optimising the Sensor Suite – Sensor Fusion and Beyond

2.00   Improving Image Quality through Camera Radiometric Calibration
- Relative and absolute radiometry for digital cameras
- Radiometric calibration techniques
- Noise characterization
- Image quality improvement using radiometric calibration

Mary Pagnutti, Owner, Innovative Imaging and Research

2.30   Seeing through optical barriers using visible light
- What is optical scattering?
- Descattering: hardware, software and hybrid based solutions
- Overcoming the challenge using All Photons Imaging
- Seeing through scattering for automotive driving

Dr Guy Satat, Researcher, MIT Media Lab

3.00   Afternoon refreshments

3.30   Novel, affordable automotive lidar solutions
- How a milliwatt peak power laser source is used to illuminate and detect objects at up to 200m distance
- High dynamic range lidar - the influence of reflectivity on LIDAR performance
- Poor weather performance (rain, fog, snow…)
- Real-world automotive test results

Filip Geuens, CEO, XenomatiX

4.00   Major Market Trends in Automotive Radar: Impact on Processing and Sensing Architectures
- Two major trends driving automotive architectures for fusion and sensing: NCAP and autonomous driving applications
- The role of radar in these market trends
- Recent developments in radar – towards high resolution
- Challenges to the increasing role of radar in autonomous driving

    o   Future role of radar in systems that scale from "entry-level" NCAP to L3/L4 autonomous driving applications

Thomas Wilson, Radar Microcontrollers Product Line Manager, NXP

4.30   Closing summary from the Chair
Prof Patrick Denny, Senior Expert, Valeo Vision Systems

4.45   Close of conference