

Sensors and Packaging for Autonomous Driving

Wednesday, May 29, 2019, 7:30 p.m. - 9:00 p.m.
Chair: Tanja Braun – Fraunhofer IZM

Agenda

- Introduction
- 5 -10 min presentation from each panelist
(5 slides each as introduction to the topic)
- Panel discussion / Q&A from audience

Panelists



Nate Brese, PhD
DowDuPont



Scott Chen
ASE Group

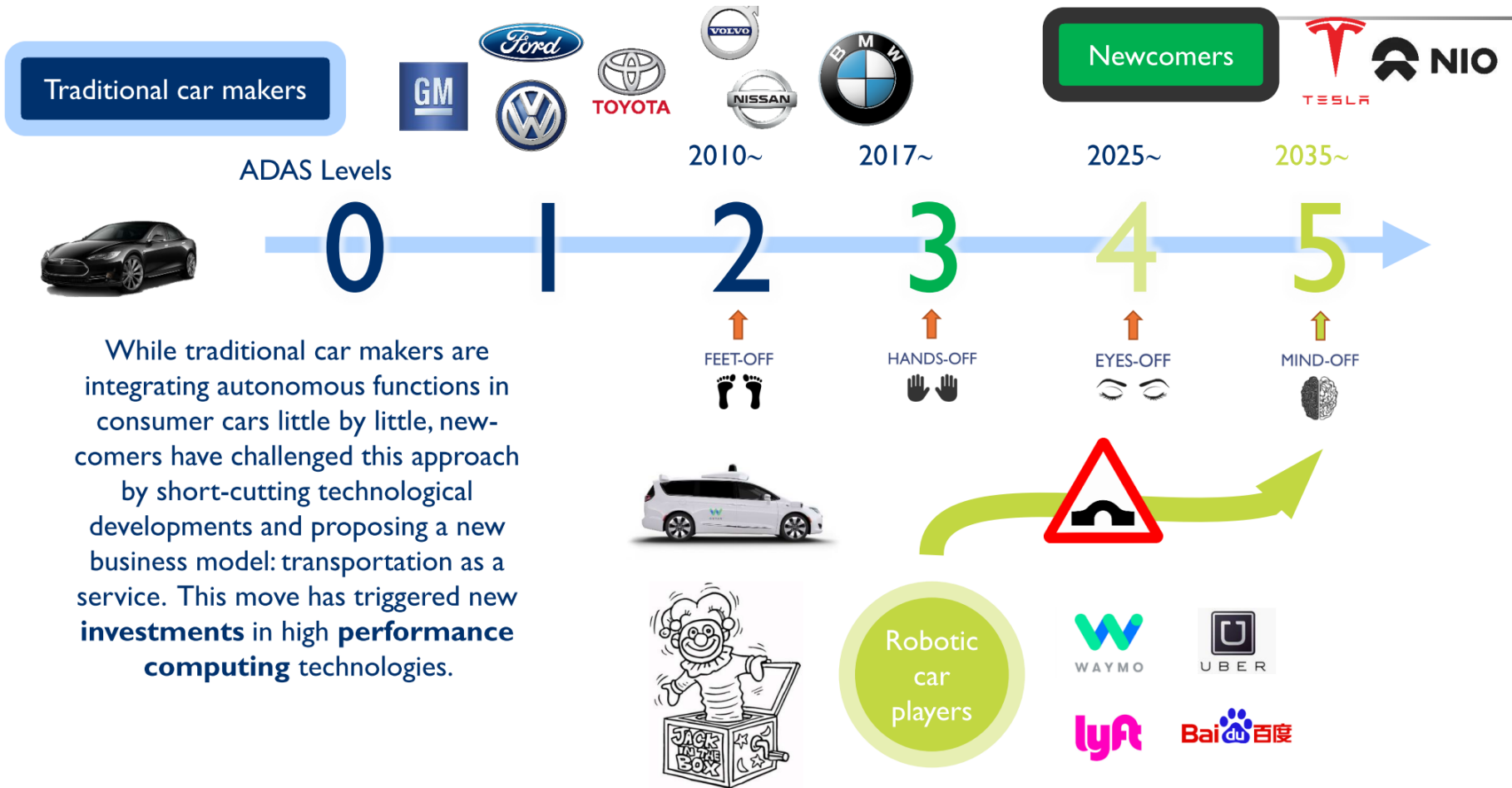


**Dr. Przemyslaw
Jakub Gromala**
Robert Bosch GmbH



Tu Anh Tran
NXP Semiconductors

Evaluation of Autonomous Vehicles

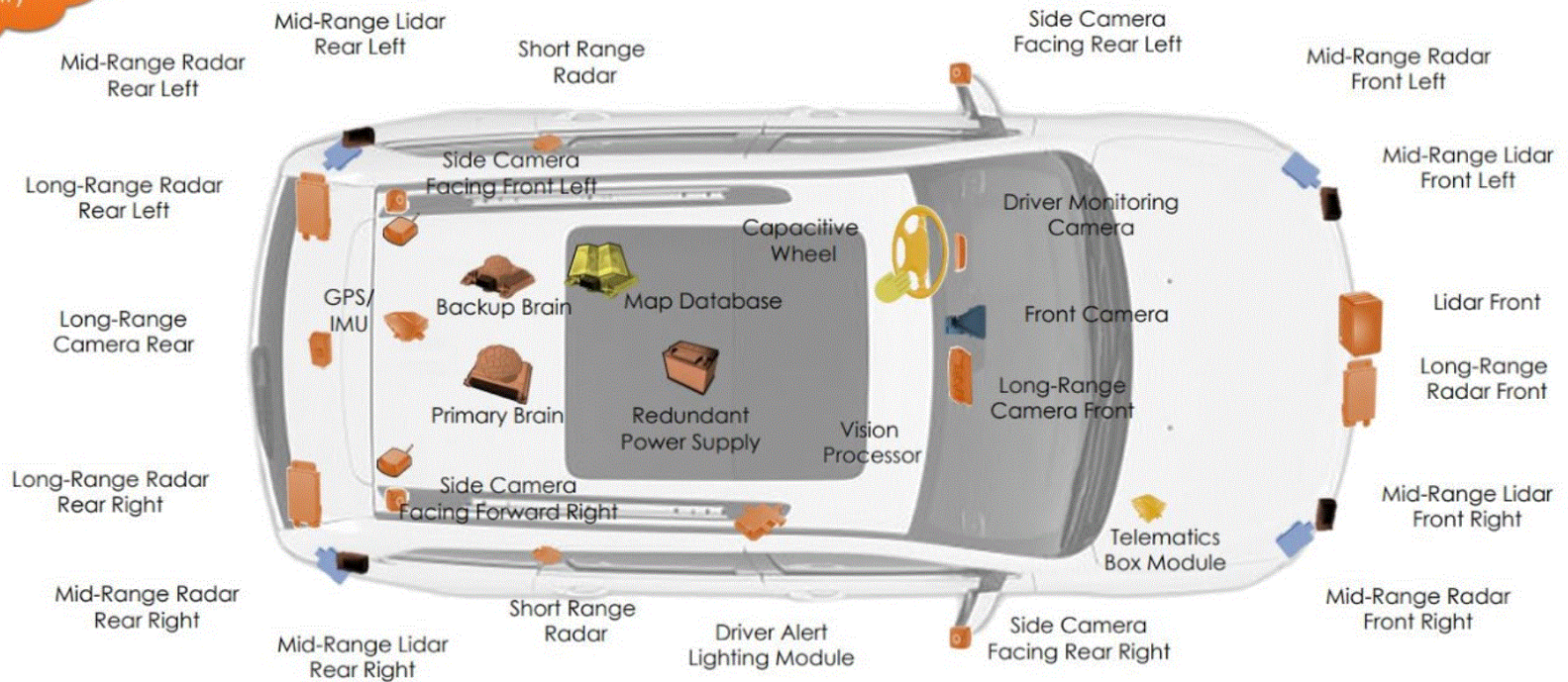


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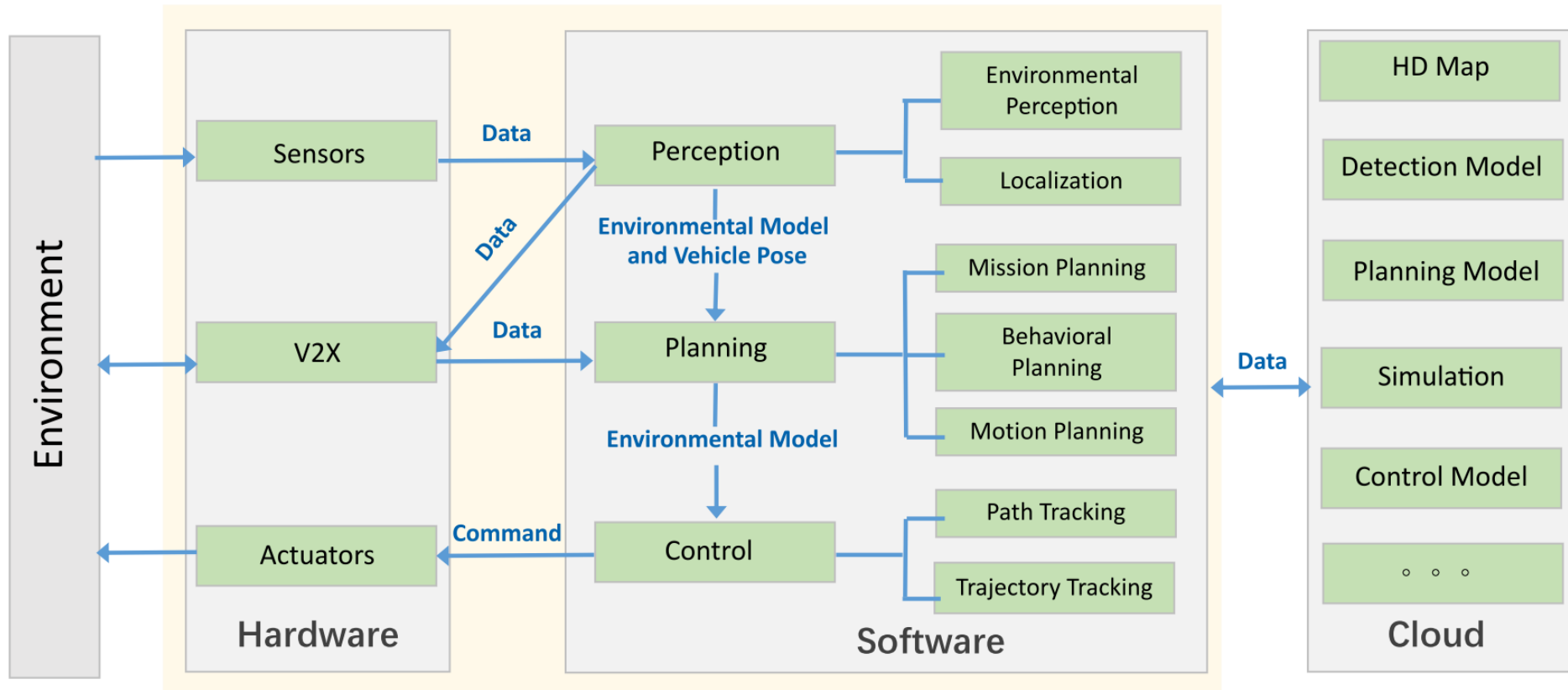
Sensors for Autonomous Driving

Hardware Level 4

Cloud Connectivity



Autonomous Driving Architecture



Source: Yu Huang, Chief Scientist of Autonomous Driving, President of Research & Innovation Center Silicon Valley, USA, 2019; Technologies and Challenging Issues in Autonomous Driving

Nate Brese, DowDuPont

Marketing Fellow and Director, Acquisitions and Business Development DuPont Electronics & Imaging



Nate Brese is a Marketing Fellow in Strategic Marketing and Business Development, leading efforts in mergers & acquisitions. He has business development activities in a variety of high-growth market segments such as automotive electronics, medical, and high-speed communication. Previously, Nate worked for Dow Electronic Materials, Shipley Ronal, Rohm and Haas, and Osram Sylvania in various research, marketing and strategy roles.

Dr. Brese earned his B.A. in the Integrated Sciences Program at Northwestern Univ. and his Ph.D. in Solid State Chemistry from Arizona State Univ. He conducted postdoctoral research at the Max Planck Institut für Festkörperforschung in Stuttgart, Germany, and at Cornell Univ. He later completed the two-year Wharton Management Certification Program at Univ. Pennsylvania.

Nate is a co-inventor on over 20 US patents and co-author of 40 scientific papers. He is a member of the ACS, MRS, and the Technical Committee of iNEMI.

Scott Chen, ASE



Sr. VP of Central Developing Engineering ASE Group, Chung-Li

Education:

- Master of National Taiwan University (NTU) Executive MBA Program
- B.A. of Chemical Engineering at NTU

Experience:

- Sr. VP of Central Development Engineering in ASE
- Staff Engineering Manager at Motorola Electronics Taiwan.
- Process Engineer in Texas Instruments Taiwan.

Przemyslaw Gromala, Bosch

Simulation Senior Expert



- PhD at Cracow University of Technology
- Robert Bosch GmbH, Automotive Electronics
- Simulation senior expert
- >15 years of experience in automotive electronics
- Leading international team
- Committee member of IEEE and ASTM conferences
- Standardization and road map
 - IEEE, EPS Reliability
 - HIR
 - EPoSS
 - IPC/JEDEC-9301

Tu Anh Tran, NXP Semiconductors



NXP Fellow, Packaging Innovation

Tu Anh Tran has 24 years of semiconductor packaging engineering experience with deep technical expertise in silicon/package integration, bond pad designs, wire bonding interconnection, comprehensive knowledge across package platforms and assembly processes, and broad strategic knowledge in formulating packaging solutions for successful products. She authored over 50 external publications and holds more than 20 issued patents, some considered fundamental patents and several patent concepts pervasively used in products at multiple Silicon technology nodes. Her current responsibility focuses in package development for automotive microcontrollers and microprocessors.

Q&A

- What is the role of advanced packaging (Fan-in/Fan-out WLP, Si Interposer, Hybridbonding,...) and are they mature for automotive applications?
- Will new materials play a greater role in chip-level or board-level packaging?
- What is the interplay (if any) of system design and packaging?
- What is the importance of consortia and alliances in developing a fully-autonomous systems?
- What are the design and modeling challenges? How far we are away from a digital twin?
- Sensors and sensor packages will play a safety relevant role for autonomous driving.
 - How will be materials and processes qualified?
 - Will there be a change in the design and manufacturing flow?
 - How much redundancy will be needed / adaptation from avionic concepts?
- With autonomous driving new mobility concepts will arise e.g. 24/7
 - Will we need new mission profiles? How will they look like?
 - How will be the sensor system monitored over lifetime (especially under very different climate conditions and mission profiles)?
 - Will we need condition monitoring of the electronics and predictive maintenance concepts?
 - How will legal issues on system failure influence sensor system packaging?
- How much miniaturization is needed? -> Trunk full of electronics...
- Will there be an aftermarket for complex sensing systems? How can standardization support this?
- Who will be the owner of autonomous driving (and flying) systems – and what is the impact on the supply chain under this circumstances?
- Easy reparability is lowering cost for repair after accidents – an also insurance cost: Is easy reparability possible for safety/security relevant systems?
- What are the technology roadblocks for autonomous driving
- **Summary: What are the key challenges concerning packaging for autonomous driving?**