



DVN

DVN Lidar Deep Dive

Welcome to the DVN Lidar Deep Dive



Eric Amiot



Leo Metzemaekers



Ralf Schäfer



Alain Serval



We are happy to host 5 Speakers :

Name	Company	Email
Paul Henri Matha	Volvo	paul.henri.matha@volvocars.com
Amogh Sakpal	fka GmbH	amogh.sakpal@fka.de
Philipp Rosenberger	Persival GmbH	philipp.rosenberger@persival.de
Clemens Linnhoff	Persival GmbH / TÜ Darmstadt	info@persival.de
Clément Nouvel	Valeo	clement.nouvel@valeo.com



And to be joined by everyone,
Live or Online !

AGENDA



- 8:30 Opening and introduction of participants
- 9:00 Deep Dive #1 Presentation including key question (s) to the workshop group
Theme: Contamination & Cleaning
Volvo: Paul-Henri Matha, "*Lidar Contamination & Cleaning*"
- 9:30 Deep Dive #2 Presentation (Tier1 or Tier2) including key question (s) to the workshop group
Theme: Contamination & Cleaning
Valeo: Clement Nouvel, "*Scala2 - securing performance and safety in adverse weather conditions*"
- 10:00 **COFFEE BREAK**
- 10:30 Four Break-Out groups, each group 2 questions
- 11:30 Reporting of Break-Out Groups and discussion
- 12:15 **LUNCH BREAK**
- 13:30 Deep Dive #3 Presentation including key question (s) to the workshop group
Theme: "Lidar performance in bad weather"
Persival GmbH - Darmstadt University / Philip Rosenberg & Clemens Linnhoff, "*Weather conditions and Lidar Perception*"
- 14:00 Deep Dive #4 Presentation including key question (s) to the workshop group
Theme: "Lidar performance in bad weather"
FKA GmbH - Aachen University / Adrian Zlocki, "*SAE/DIN Testing Standards and extension to Weather Conditions*"
- 14:30 Four Break-Out groups, each group 2 questions
- 15:30 **COFFEE BREAK**
- 16:00 Reporting of Break-Out groups and discussion
- 16:30 What did we learn together?
- 17:00 Closure

DVN Lidar Community Membership

Included in the DVN Lidar Subscription Package:

Gold Membership (Single User Licence)

Monthly NewsLetter

White Papers

Free Entry to 3 DVN Lidar « Deep Dive » Events

Free Entry to 1 Lidar Conference

We plan multiple activities for our members, higher speed of learning and networking

Our next events will be

- Deep Dive May 2023
- Deep Dive together with DVN Lighting workshop San Jose (USA) Aug 29/30, 2023
- 6th DVN Automotive Lidar Conference, Wiesbaden Nov 29/30 , 2023

Lidar Deep Dive: Briefing & Concept

- We plan 4 presentations, 30 minutes each
- We want to go in depth / content for each presentation, whereas in our lidar conference we will have up to 28 speakers and limited time to go in depth for each topic
- Invitations are for our DVN lidar members and new potential members
- Our speakers will have each 1-3 questions for the breakout groups
- We want to invite **YOU** to use the opportunity to present and share your insights with fellow members

Lidar Deep Dive Today

Many thanks to our 4 presenters for today

Name	Company
Paul Henri Matha	Volvo
Amogh Sakpal	fka GmbH
Philipp Rosenberger	Persival GmbH
Clemens Linnhoff	Persival GmbH / TÜ Darmstadt
Clément Nouvel	Valeo

- They will share their knowledge to our community in their deep dive presentations
- They will provide us with one our two questions to be discussed in the breakout groups
- Each breakout group will give feedback in the plenary sessions

Speaker 1 Paul-Henri Matha

“ Contamination & Cleaning ”



Paul-Henri Matha, Volvo Car Corporation, Technical Leader Exterior Lighting

Paul-Henri Matha was the Lighting Project Manager on Megane 2 and 3 then Head of Pre-Development and Innovation of Manager of the Lighting and seating department at Renault in Bucharest for the Dacia range. He was nominated Expert lighting of Renault, His name in the field of lighting. Paul Henri is at Volvo since 2018

Speaker 2 Clément Nouvel

Scala2 - securing performance and safety in adverse weather conditions



Clément Nouvel, Valeo Group, CTO Lidar

Prior to this position, Clément has been acting as Active Safety Business Development Director from 2016 to 2019 and held several positions at Renault-Nissan Alliance from 2003 focused on innovation engineering and project management, based in France and Asia.

He is currently in charge of leading Valeo LiDAR product development, a global team including functions ranging from Business Development to Engineering and Technology Partnerships

Questions for the breakout groups

Presentation by Paul-Henri Matha

- Q1 Which criteria should be define for a good performance ?
- Q2 Can we define standard test ?

Presentation by Clément Nouvel

- Q1 How to accelerate the convergence pace of testing standards in adverse environments?
- Q2 When do you see LiDARs integration behind the windshield feasible and mainstream?

Breakout groups return for plenary report out at 11.30 CET

- Breakout group 1 Leo Metzemaekers / moderator
- Breakout group 2 Ralf Schäfer / moderator
- Breakout group 3 Eric Amiot & Alain Servel / moderator

Breakout group 1 / Leo Metzemaekers



Name	Company	Email
Clemens Hofmann	AMS Osram	clemens.hofmann@ams-osram.com
Henri Haefner	Cepton	henri.haefner@cepton.com
Marcel Neef	TÜV Rheinland	Marcel.Neef@de.tuv.com
Markus Winkler	Docter Optics	markus.winkler@docteroptics.com
Harry Zhao	Jidu Auto	heng.zhao@jiduauto.com
Dong Xingmei	LSILIDAR	xingmeidong@lslidar.com
JIN Hui	Mind	jinhui@mind-ea.cn
Sergei Plotavtsev	Innolume	Sergei.Poltavtsev@innolume.com
Konstantin Fichtner	Mercedes Benz	konstantin.fichtner@mercedes-benz.com
Raed El Makhour	AGC Automotive Europe	raed.elmakhour@agc.com
Frank Li	Zvision	yunxiang.li@zvisiontech.com
Jerry Qin	Zvision	chao.qin@zvisiontech.com
Dong Shangqing	Shanghai Daxin Semiconductor Co.,Ltd	dong@daxinsh.com
Xu Guanjie	Tanway	xuguanjie@tanway.com
Dylan Xu	Vision Track	Dylan@visiontrack.com
Phil Lee	OFILM	li.wanguo@ofilm.com
Leo Metzemaekers	DVN	leo.metzemaekers@kpnmail.nl
Ann Ai	DVN	lady.ann.ai@drivingvisionnews.com

Breakout group 2 / Ralf Schäfer



Name	Company	Email
Thomas Luce	MicroVision	thomas_luce@microvision.com
Zhang Xiobin	Huawei	hw.zhangxiaobin@huawei.com
Wilhelm Dosch	Lumentum	wilhelm.dosch@lumentum.com
Bircan Taşlica	TÜV Rheinland	Bircan.Taslica@de.tuv.com
Martin Enenkel	Docter Optics	enenkel@docteroptics.com
Gan Fengyu	SAIC VW	ganfengyu@csvw.com
Ling Ming	Shanghai Universtity	lingming200093@hotmail.com
Jiang Bo	RICHBEAM	jiangbo@richbeam.com
Dan Sibka / Tom Eldridge	Chasm	ijiang@chasmttek.com
Niklas Andermahr	Diopic	andermahr@diopic.de
Akash Rabadiya	Innovusion	Akash.Rabadiya@eu.innovusion.com
Shen Chao	Human Horizons	Chao_shen1@human-horizons.com
Norman Yuan	Human Horizons	Norman_yuan@human-horizons.com
Yudai Furugori	Stanley	yudai_furugori@stanley.co.jp
Hujun HUANG	SUNNY OPTECH	huanghj@sunnyoptical.com
Ralf Schäfer	DVN	ralfschaefer2@t-online.de
Eiichi Ono	DVN	eono@drivingvisionnews.com

Breakout group 3 / Eric Amiot & Alain Serval



Name	Company	Email
Nail Valeev	TÜV Rheinland	Nail.Valeev@de.tuv.com
Florian Pilz	Docter Optics	florian.pilz @docteroptics.com
Motohiro Komatsu	Koito	mkomatsu@koito.co.jp
Kazuma Hashimoto	Koito	k-hashimoto@koito.co.jp
Rainer Hagen	Covestro	rainer.hagen@covestro.com
John Peek	KSLD	john@jpinnconsult.com
SangWon Lee	Plastic Omnium	sang-won.lee@plasticomnium.com
Olaf Hug	Mechaless GmbH, ElmosGroup	olaf.hug@mechaless.com
David Auger	Ansys	david.auger@ansys.com
Dmitri Chezhi	Innolume	Dmitri.Chezhi@innolume.com
Javier Ibanez	Renault	javier.ibanez-guzman@renault.com
Francois Simoens	Steerlight	francois.simoens@cea.fr
Rain Rui	NUEVITION	rain.rui@neuvition.com
Melanie Zhang	Surestar	zhangdd@isurestar.com
Alain Serval	DVN	alain.serval@drivingvisionnews.com
Eric Amiot	DVN	eric.amiot@drivingvisionnews.com
Tylon Zu	DVN	tylon@drivingvisionnews.com

BACK AT 11.30 CET for plenary report out

**Plenary session 1: breakout
groups reporting back for
presentation 1 & 2**

DVN – Lidar Deep Dive Program 2023 => Validation

Deep Dive I	27-28 February at Dorint Pallas Wiesbaden
Deep Dive II	Early June at Dorint Pallas Wiesbaden
Deep Dive III (USA)	29-30 August in Redwood (San Francisco Bay)
Lidar Deep Dive I	Lidar contamination and cleaning Lidar performance in bad weather conditions
Lidar Deep Dive II	Short Range Lidars & 360° lidar integration SR-Lidar applications vs Imaging Radars
Lidar Deep Dive III	Lidar integration on Trucks & Robotaxis Innovations in Lidar Components

**We are back at 13.30 hrs CET with our
next presentation**

Speakers 3 Philipp Rosenberger & Clemens Linnhoff

” Weather conditions and Lidar Perception ”



Dr.-Ing. Clemens Linnhoff

2018 M.Sc. in Mechatronics Engineering from TU Darmstadt
2021 Co-founder and CTO of Persival GmbH
2023 Dr.-Ing. in Mechanical Engineering from TU Darmstadt
Expertise: Metrics for Credibility in Simulation of Active Perception Sensor Systems
Co-founder of PerCOLLECT Initiative
Sub-Library Maintainer at OpenMSL



Dr.-Ing. Philipp Rosenberger

2016 M.Sc. in Mechatronics Engineering from TU Darmstadt
2021 Co-founder and CEO of Persival GmbH
2022 Dr.-Ing. in Mechanical Engineering from TU Darmstadt
Expertise: Analysis of Environmental Influences for Simulation of Active Perception Sensors
Co-founder of PerCOLLECT Initiative
Member of the Change Control Board of ASAM
OpenSimulationInterface

Speaker 4 Amogh Sakpal

“Lidar performance in bad weather”



Amogh Sakpal,
fka GmbH, Senior Engineer Automated Driving & Machine Perception

Born and brought up in India, I moved to Germany in 2011 after completing my Bachelor's degree in Mechanical Engineering. I graduated with Master's Degree in Automotive Engineering from the RWTH University in 2014 and joined fka GmbH in the same year as an engineer in the automated driving department. Undertaking functional development projects in ADAS domain, I later joined the Machine Perception team and I have continued to support the industry on the functional development, testing and data analysis level. In 2022, I was appointed co-lead for development of test methods for standardised testing of lidar sensors and have been involved in the formulation of the DIN Specification 91471 since its conception until its expected release in March 2023

Questions for the breakout groups

Presentation by Philipp Rosenberger / Clemens Linhoff

- Q1 How will the shown influences possibly affect downstream signal processing algorithms (object detection, SLAM etc.)?
- Q2 Is it possible to have a generic simulation model with environmental conditions that can be parameterized to different lidar sensors?
- Q3 What part does the ODD play when considering environmental conditions? (There is no rain in parking structures, but there is a lot of dust on a corn field)

Presentation by Amogh Sakpal

- Q1 How large is the need for lidar simulation. In which format shall simulations be done : virtual Sensor/Target or real sensor with virtual target ?
- Q2 Which influence does rain have on sensors and their performance ?
- Q3 How can dirt be represented reproducibly for performance tests ?

Breakout groups return for plenary report out at 16.00 CET

- Breakout group 1 Leo Metzemaekers / moderator
- Breakout group 2 Ralf Schäfer / moderator
- Breakout group 3 Alain Serval / moderator

Breakout group 1 / Leo Metzemaekers



Name	Company	Email
Clemens Hofmann	AMS Osram	clemens.hofmann@ams-osram.com
Henri Haefner	Cepton	henri.haefner@cepton.com
Marcel Neef	TÜV Rheinland	Marcel.Neef@de.tuv.com
Markus Winkler	Docter Optics	markus.winkler@docteroptics.com
Harry Zhao	Jidu Auto	heng.zhao@jiduauto.com
Dong Xingmei	LSILIDAR	xingmeidong@lslidar.com
JIN Hui	Mind	jinhui@mind-ea.cn
Sergei Plotavtsev	Innolume	Sergei.Poltavtsev@innolume.com
Konstantin Fichtner	Mercedes Benz	konstantin.fichtner@mercedes-benz.com
Raed El Makhour	AGC Automotive Europe	raed.elmakhour@agc.com
Frank Li	Zvision	yunxiang.li@zvisiontech.com
Jerry Qin	Zvision	chao.qin@zvisiontech.com
Dong Shangqing	Shanghai Daxin Semiconductor Co.,Ltd	dong@daxinsh.com
Xu Guanjie	Tanway	xuguanjie@tanway.com
Dylan Xu	Vision Track	Dylan@visiontrack.com
Phil Lee	OFILM	li.wanguo@ofilm.com
Leo Metzemaekers	DVN	leo.metzemaekers@kpnmail.nl
Ann Ai	DVN	lady.ann.ai@drivingvisionnews.com

Breakout group 2 / Ralf Schäfer



Name	Company	Email
Thomas Luce	MicroVision	thomas_luce@microvision.com
Zhang Xiobin	Huawei	hw.zhangxiaobin@huawei.com
Wilhelm Dosch	Lumentum	wilhelm.dosch@lumentum.com
Bircan Taşlica	TÜV Rheinland	Bircan.Taslica@de.tuv.com
Martin Enenkel	Docter Optics	enenkel@docteroptics.com
Gan Fengyu	SAIC VW	ganfengyu@csvw.com
Ling Ming	Shanghai Universtity	lingming200093@hotmail.com
Jiang Bo	RICHBEAM	jiangbo@richbeam.com
Dan Sibka / Tom Eldridge	Chasm	ijiang@chasmttek.com
Niklas Andermahr	Diopic	andermahr@diopic.de
Akash Rabadiya	Innovusion	Akash.Rabadiya@eu.innovusion.com
Shen Chao	Human Horizons	Chao_shen1@human-horizons.com
Norman Yuan	Human Horizons	Norman_yuan@human-horizons.com
Yudai Furugori	Stanley	yudai_furugori@stanley.co.jp
Hujun HUANG	SUNNY OPTECH	huanghj@sunnyoptical.com
Ralf Schäfer	DVN	ralfschaefer2@t-online.de
Eiichi Ono	DVN	eono@drivingvisionnews.com

Breakout group 3 / Eric Amiot & Alain Serval



Name	Company	Email
Nail Valeev	TÜV Rheinland	Nail.Valeev@de.tuv.com
Florian Pilz	Docter Optics	florian.pilz @docteroptics.com
Motohiro Komatsu	Koito	mkomatsu@koito.co.jp
Kazuma Hashimoto	Koito	k-hashimoto@koito.co.jp
Rainer Hagen	Covestro	rainer.hagen@covestro.com
John Peek	KSLD	john@jpinoconsult.com
SangWon Lee	Plastic Omnium	sang-won.lee@plasticomnium.com
Olaf Hug	Mechaless GmbH, ElmosGroup	olaf.hug@mechaless.com
David Auger	Ansys	david.auger@ansys.com
Dmitri Chezhi	Innolume	Dmitri.Chezhi@innolume.com
Javier Ibanez	Renault	javier.ibanez-guzman@renault.com
Francois Simoens	Steerlight	francois.simoens@cea.fr
Rain Rui	NUEVITION	rain.rui@neuvition.com
Melanie Zhang	Surestar	zhangdd@isurestar.com
Alain Serval	DVN	alain.serval@drivingvisionnews.com
Eric Amiot	DVN	eric.amiot@drivingvisionnews.com
Tylon Zu	DVN	tylon@drivingvisionnews.com

BACK AT 16:00 CET for plenary report out

**Plenary session 2: breakout
groups reporting back for
presentation 3 & 4**

Learnings for today

- Reasons for contamination ? Ways to minimize contamination ?
- Methods and best practices for cleaning ?
- New insights into weather influences ?
- Behavior of simulations and test methods under varying weather conditions ?

Closure => Next steps to improve DVN “Tech Platform”

China On-site Event – “Lidar Deep Dive / Suzhou”

- Part of DVN-Lighting Workshop (250p in 2022) incl. 1 lidar session (4 speakers)
- Lidar deep dive workshop following in a separate room (6 speakers)
- Lidar booths located with Lighting booths

DVN members contribution – “ Introduction of New Products & Technologies”

- Call for White papers (industry & academics)

DVN special events – “Presentation of start-ups“

- As part of DVN-Lidar conference & US-CN Deep dives (4 start-ups) ?

DVN special reports – “Understanding the Market “

- 2022 - “Tesla Autopilot – its implication for the growth of the lidar growth”
- 2023 ? - Which applications for SR-Lidar & Imaging Radars
- 2023 ? - Lidar benefit for road safety – contribution to critical use cases

**Thank you all : learn ,
promote and network !!!**

**Sincerely,
The DVN team**