

DVN Detroit | September 2021

The Two Second Advantage

4D Predictive Perception
powered by FMCW Smart
Headlamps for Enhanced
Safety and Performance



L. Brisson

R. Muenster

J. Pazhayampallil

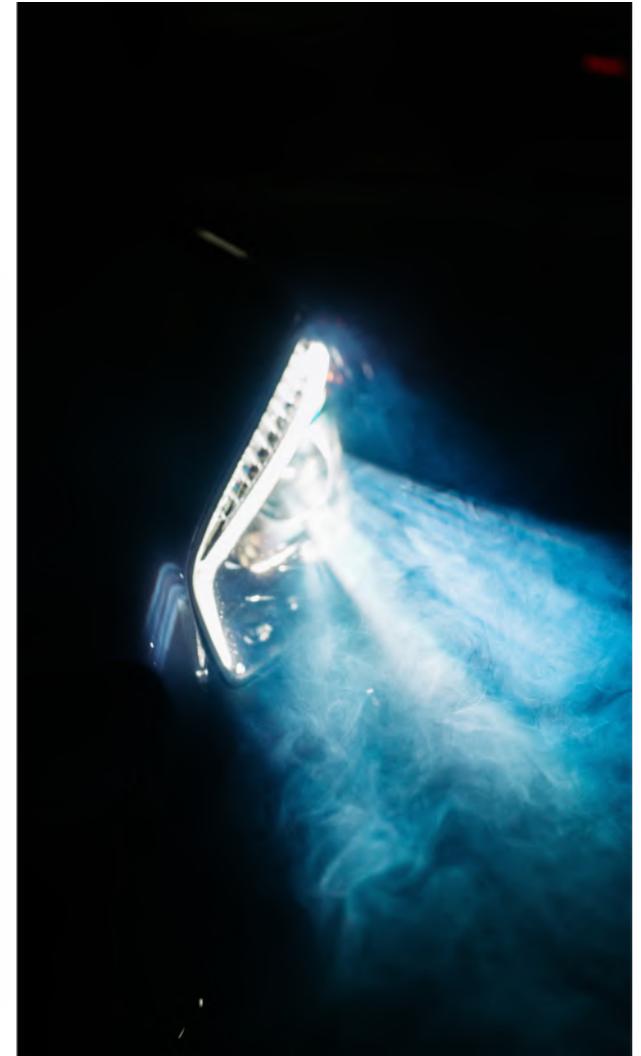


SiLC

BLUESPACE

Agenda

- 1 **Introduction to Predictive Smart Headlamps**
- 2 **SiLC:** Integrated hardware with FMCW technology
- 3 **BlueSpace:** 4D Predictive Perception for L3+
- 4 **Conclusion**



SiLC

 **BLUESPACE**

PERFORM@CHANGE

Predictive smart headlamp to power safer driving



April 2021

- Presented benefits and challenges of FMCW Lidar integration into headlamp project during DVN Shanghai
- Since then, have added cutting-edge software to provide a complete smart headlamp system with predictive perception
- Adding BlueSpace.ai's software provides a never-before-seen solution for autonomy



September 2021

What we will reveal today

- What can be made possible with Varroc's headlamp, SiLC's FMCW lidar, and BlueSpace's software all in one
- Allows AVs to truly scale to all locations, for all objects - day or night
- Videos will showcase 4D Predictive Perception software in action on public roads, driving at night-time.



SiLC Introduction



Overview

- Mission: To enable market transition to coherent 3D sensing technology across a broad range of applications
- Established 2018
- HQ Monrovia, CA
- 40 people
- Investors include:



OSRAM **SONY** **EPSON** **UMC** **DELL**

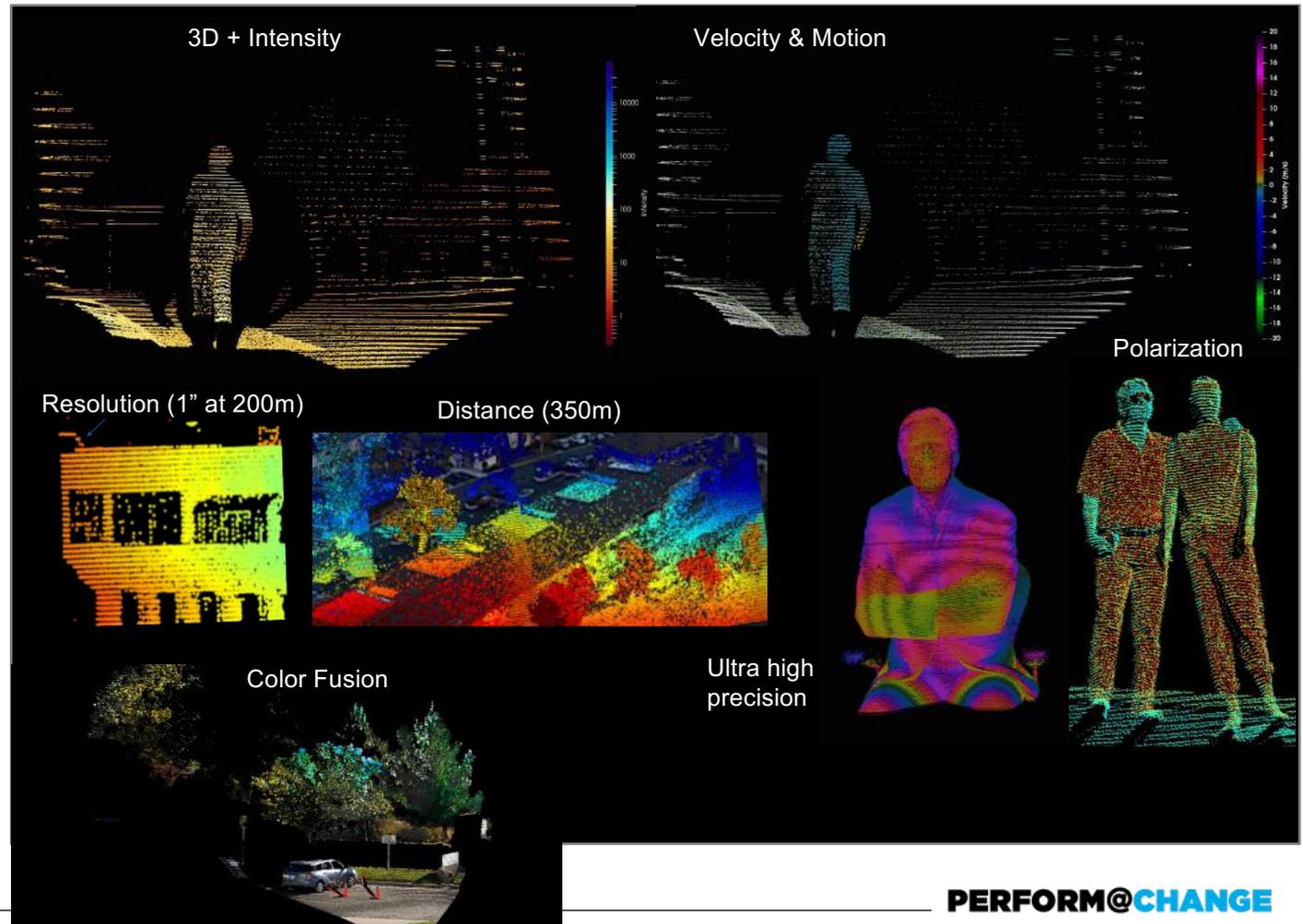


Technology

- 25+ year heritage in Silicon Photonics
- Proprietary silicon photonics integration platform with 10-100x better performance than competitors
- Coherent Imaging platform with best performance and widest range of data (depth, motion, polarization ...)
- Proven technology and well-established high-volume manufacturing
- Only player that can integrate all photonics components needed for FMCW in a single chip

Key Features of SiLC's Smart Vision

- Works in any lighting condition (integrated light source)
- Interference, hack immune and eye safe (1550nm)
- Long range and high resolution enable early identification of objects and analysis of shape and form
- Polarization and wavelength information facilitates material identification and surface analysis
- Precise velocity enables rapid threat detection and analysis of motion (micro-doppler) for object classification
- Color fusion



Bluespace: Perception Without Boundaries



4D PREDICTIVE PERCEPTION FOR ALL AUTONOMY

- Measurement, not inference based approach
- Full motion measurement of all objects
- Scalable, ready to deploy solution



OUR TEAM

- AV industry veterans
- Experience working at AV companies, OEMs, and top AV research institutions
- Launched successful passenger-carrying services in California, Texas and Florida.



SiLC

BLUESPACE

PERFORM@CHANGE



Smart Headlight

Detects and Predicts Motion



Regular headlights
1900s



Camera vision
2000s



3D LiDAR spinner
2005



4D LiDAR on a chip
2018



Smart Headlights
(Headlights + LiDAR
+ Perception SW)
2021



SiLC

BLUESPACE

PERFORM@CHANGE



A truly scalable solution for ADAS/AD



**No Training
Required**



**No HD
Map Required**



**Works
Everywhere**



SiLC

 **BLUESPACE**

PERFORM@CHANGE



Performance

That wasn't possible before



**Handles All Objects,
In All Locations**



**Reduced
Compute**



**Faster
Reaction Time**



**Improved
Reliability**



SiLC

 **BLUESPACE**

PERFORM@CHANGE

Enabling commercialization of L3/L4 driving



**Certifiable by
third parties**



**Capital and Time
Efficient**



**No Data Privacy
Concerns**



SiLC

 **BLUESPACE**

PERFORM@CHANGE

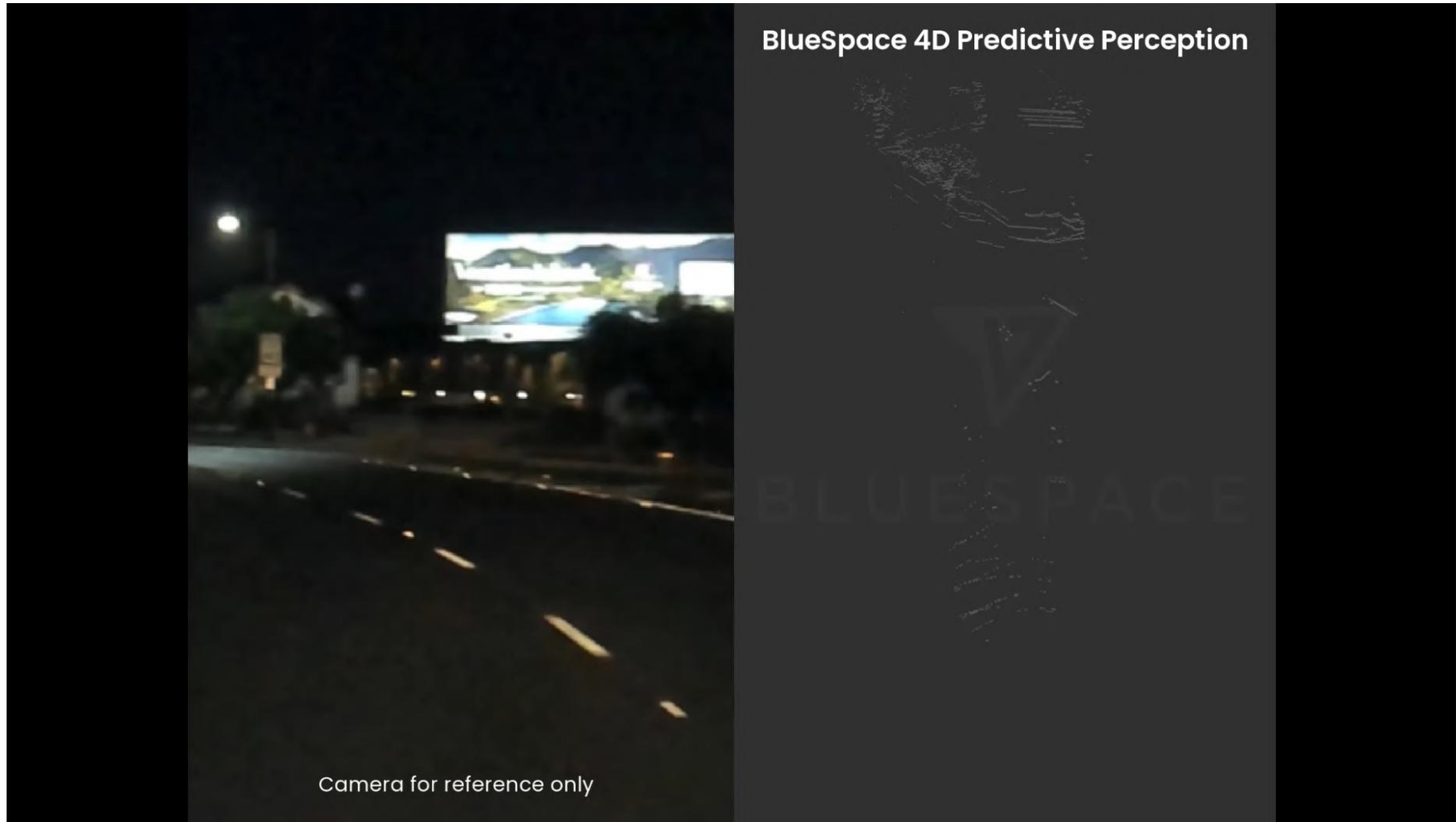


How do we do on public roads? See for yourself

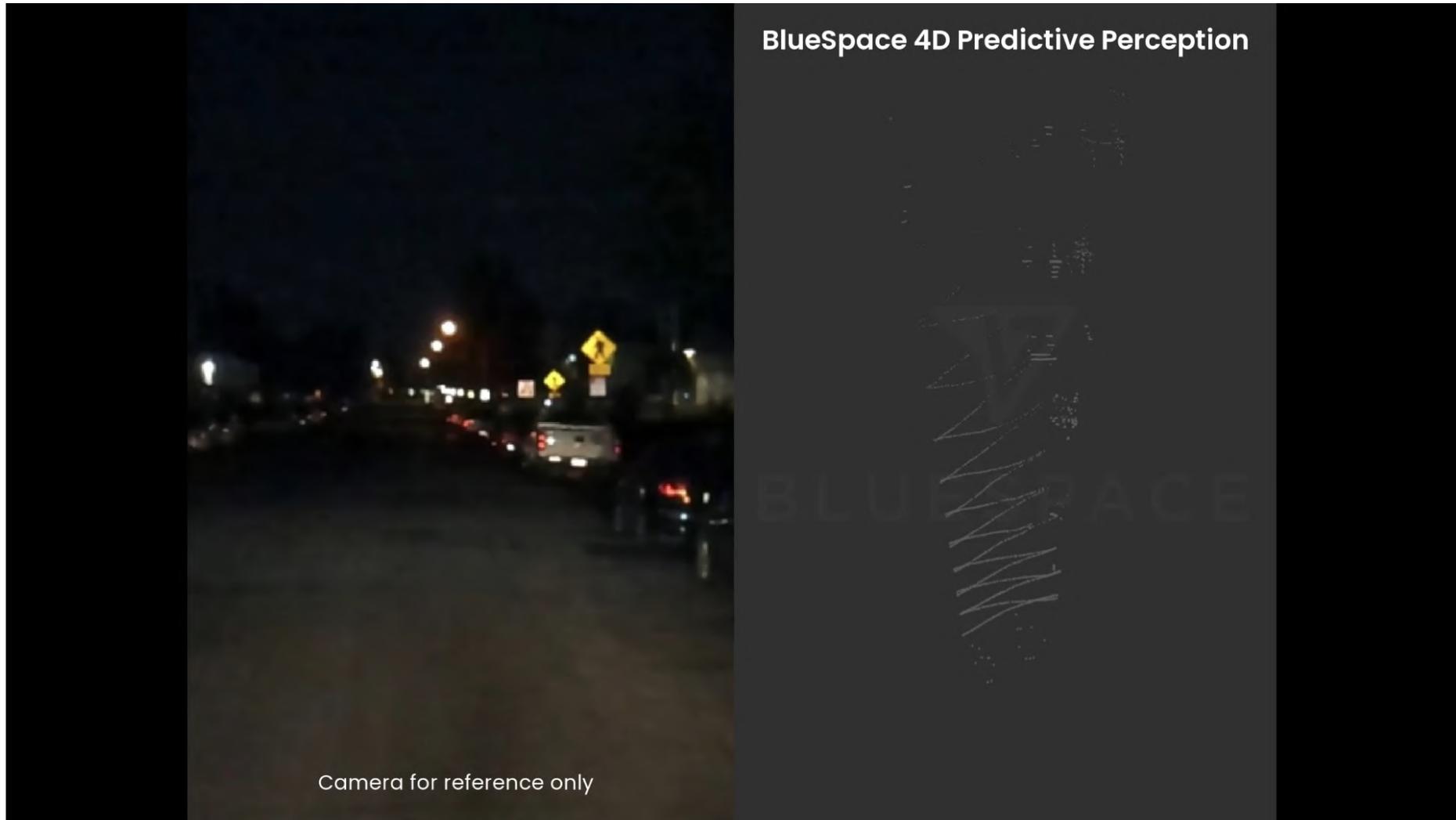
- ✓ Works for all objects in all locations
- ✓ Measures velocity and rotation in single frame
- ✓ Has no dependency on prior training nor HD map



Navigating through mixed traffic



Effective with vulnerable road users



Camera for reference only

ANGE



Scalable solution for L3+ commercialization



Perception Without Boundaries

- Any place
- Any object
- Immediately deployable

Where do you want to go?

contact us at partners@bluespace.ai



SiLC

 **BLUESPACE**

PERFORM@CHANGE

Experience it yourself first hand



Q1 22



Smart headlamp will be available
on demo vehicle

**Want to see
this in your
car? Let's
talk!**

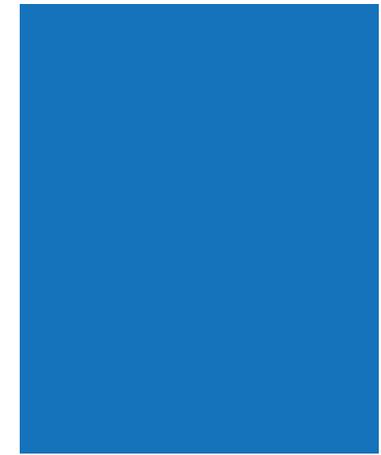


SiLC

 **BLUESPACE**



Thank You



www.varroclighting.com

lbrisson@varroclighting.com

www.silc.com

ralf@silc.com

www.bluespace.ai

joel@bluespace.ai



SILC

BLUESPACE