Prepared for

EPIC
European Photonics Industry Consortium

SCANTINEL® PHOTONICS
Scan | Detect | Navigate

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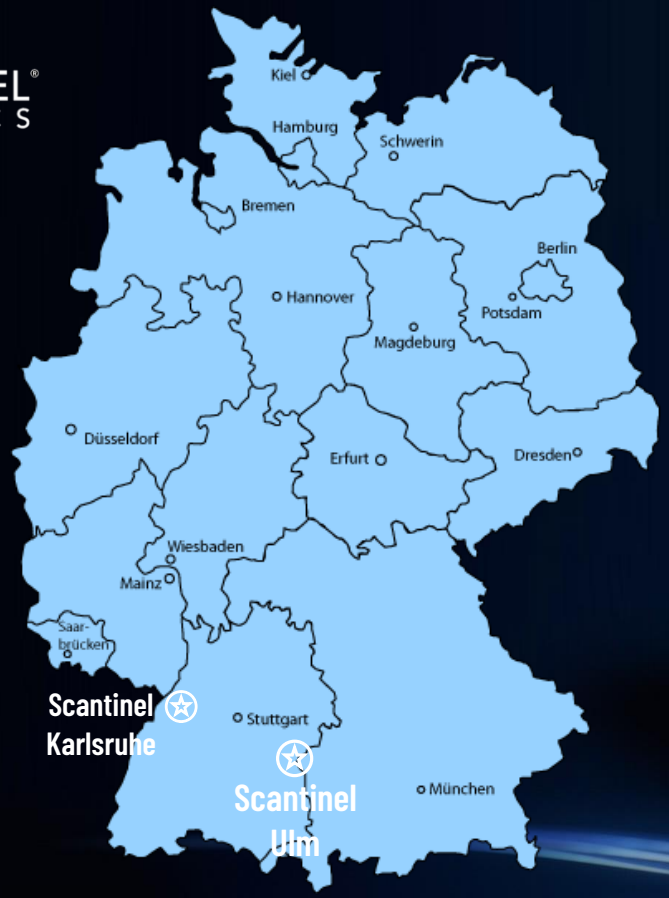
SCANTINEL's approach to FMCW LiDAR

Overview of SCANTINEL

SCANTINEL PHOTONICS



Our mission is to create optimum value for our customers and partners by providing outstanding LIDAR solutions

- Located in Germany with offices in Ulm and Karlsruhe
- Focus on FMCW-LiDAR technology for mobility applications

SCANTINEL is backed by:

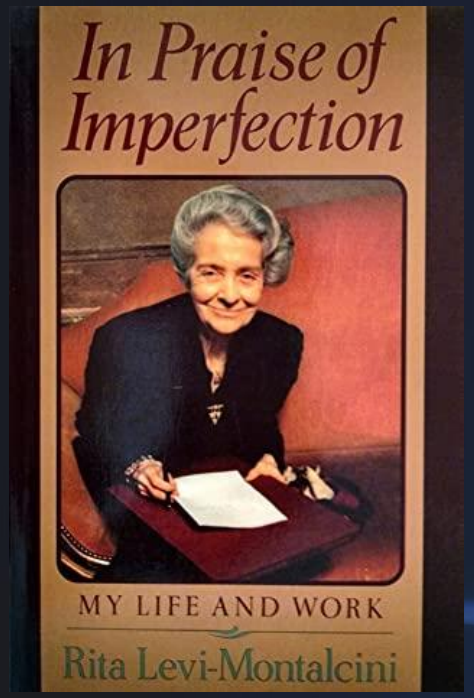
ZEISS

SCANIA

In Praise of Imperfection

Rita Levi-Montalcini (1909-2012)

- Italian researcher in the field of Neurobiology
- Awarded the 1986 Nobel Prize in Physiology or Medicine

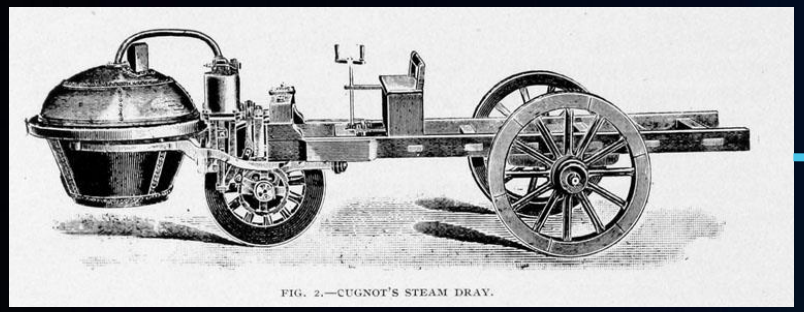


Imperfection drives evolution and innovation

In Praise of Imperfection: how imperfection drives innovation

1885 - Safety bike
John Kemp Starley

2021 – Bolide HR
Campagnolo

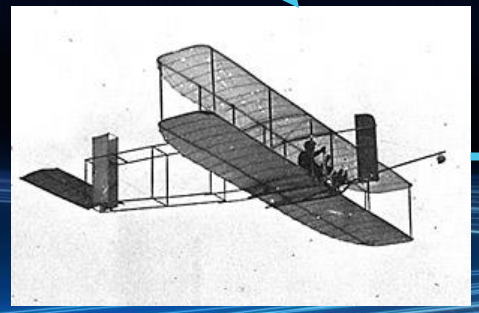


1770 – Steam Dray
Joseph Nicolas Cugnot

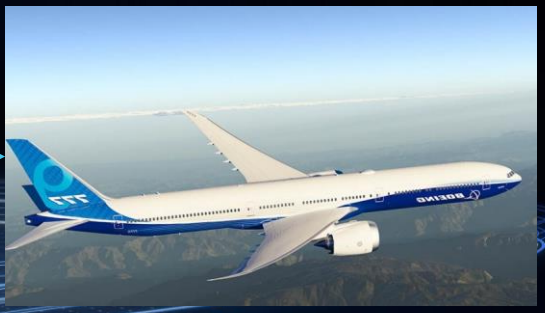
1885 – Gasoline Engine
Carl Benz

2021 – Model S
Tesla

1903 – Flyer
Wright Brothers

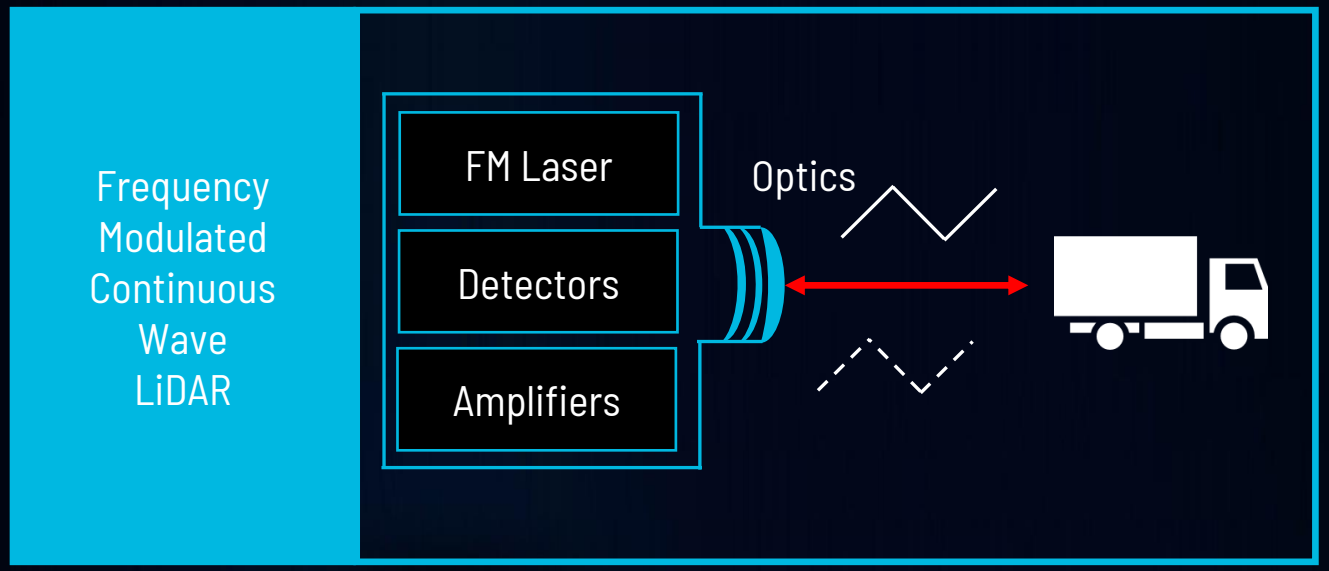


2020 – 777X
Boing



The innovation of FMCW LiDAR

TOF ----▸ FMCW



- 5D Data: 3D + velocity and reflectivity
- Over 300m range
- High immunity to interference through coherent detection

The challenges of FMCW LiDAR

SCANNING

- Avoid **phase decorrelation** to prevent the loss of coherence of the system
- Allow **channel parallelization** to enhance the pixel rate of the system

Our Approach

SCANTINEL PHOTONICS

- Optical Enhanced Array (OEA™) combines a photonic integrated chip (PIC) with advanced optics
- Solid-state scanning on the fast axis avoids phase decorrelation and guarantees the coherence of the system
- Silicon photonics-based scanner enables massive parallelization of FMCW channels in the system to achieve up to 2MP/s

The challenges of FMCW LiDAR

FMCW ENGINE

- **Linear tunability** and **narrow linewidth** of the laser
- **Amplification** of laser light power
- **Coherent detection**

Our Approach

SCANTINEL PHOTONICS

- Integrated InP laser on Photonic Integrated Circuit to achieve high linearity and narrow linewidth
- 1550nm laser to achieve over 300m range and to enhance system performances in fog
- Light amplification based on EDFA or SOA based on customer requirements of operating temperature
- Integrated detectors to reduce losses and achieve higher detection performances

The challenges of FMCW LiDAR

SCALABILITY

- **Flexibility** to fit different customers requirements
- **Mass manufacturability**
- Competitive price

Our Approach

- Photonic integrated chip approach combined with parallelization of FMCW channels enables the flexibility of the system to fit different requirements and use cases
- CMOS-compatible silicon photonics platform and highly integration of the system drives mass manufacturability and price-point competitivity

Development is on track and shows very good traction

A-Sample

- First system with OEA™ approach and photonics integrated circuit
- First data available in October 2021
- Target specs available on request

Traction

- Received "2021 Best Practices Technology Innovation Leadership Award" from Frost & Sullivan
- Interaction and joint development projects with customers in all the targeted market segments

Scantinel believes that collaboration is essential

Topics for collaboration

- Cost reduction for 1550nm EDFA
- Active cooling systems to allow efficient use of SOA at high temperature

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Thank You.
Let's connect.

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