

Enabling winter-capable autonomous driving





TRACSENSE

Enabling winter-capable autonomous driving





## SEASONAL EFFECTS (AUTUMN & WINTER)



### **Volatile road conditions affecting:**

- Vehicle dynamics (braking distance)
- Maneuvering limits
- Behavioral patterns of road users
- Performance of on-board sensor systems



TRACSENSE

Enabling winter-capable autonomous driving

IP67 environmental protection

Adjustable optics (eval.)

Durable optical components

Identify water, ice, chemicals and organic material



IP67 USB 2.0

IP67 RJ45

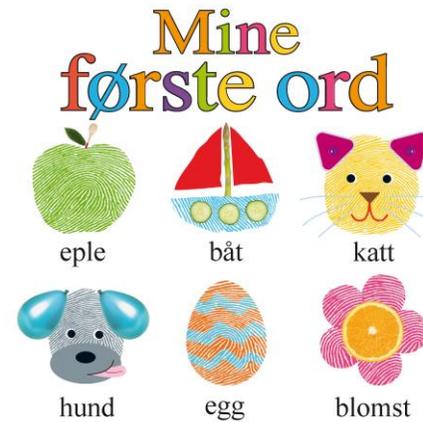
IP67 GPIO / CAN

## HOW TO TRAIN YOUR AI BABY?

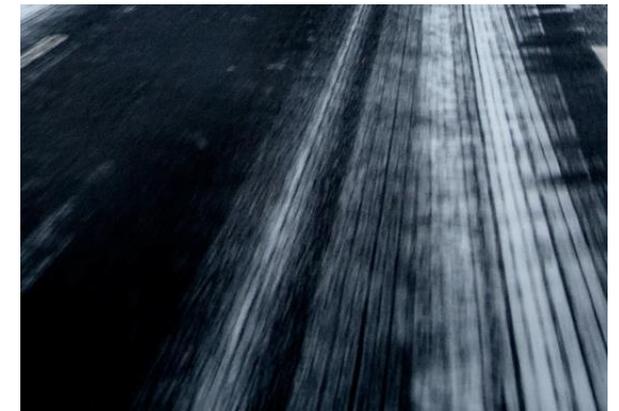
- Tell the baby which animals it is looking at
- Present different scenarios, and different settings
- A relation between observation and reference forms

## SOME CHALLENGES:

- Extreme dependency on data (and variety)
- Humans easily reason their classification
- With AI this reasoning can be tedious to decipher



From: Spektrum Forlag / Gobokens blogg (retr. April 2019)





A BRIEF OVERVIEW OF SPECTROSCOPY TECHNOLOGY

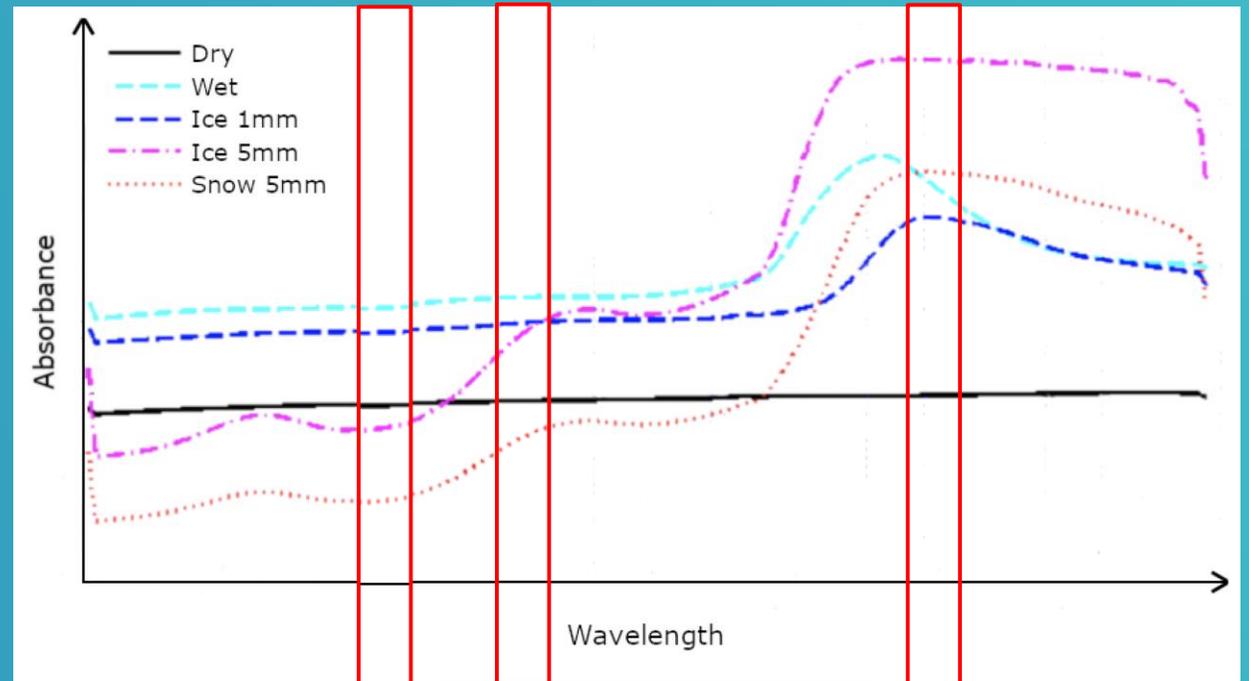
**More than 70 data points**

- Essentially reconstructing the entire signature

**Substantially more robust**

- Different surfaces in a variety of conditions

**And ... a lot cheaper**



Generic plot of light absorption of water in different states



A BRIEF OVERVIEW OF SPECTROSCOPY TECHNOLOGY

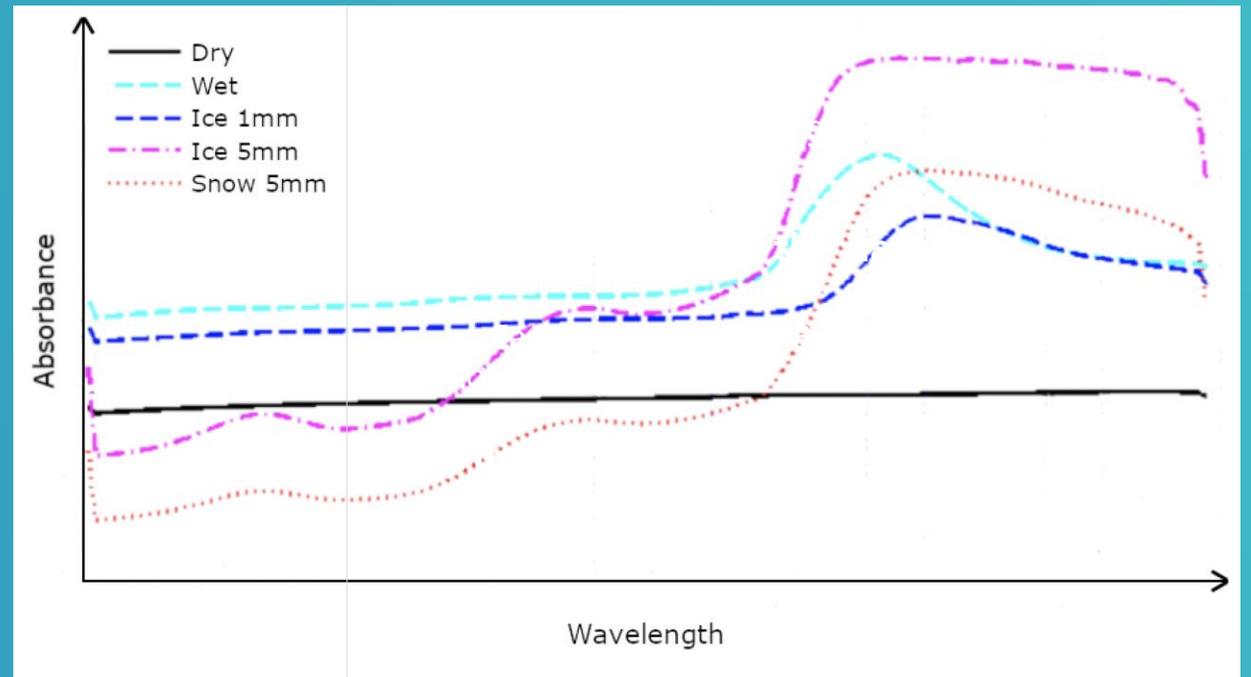
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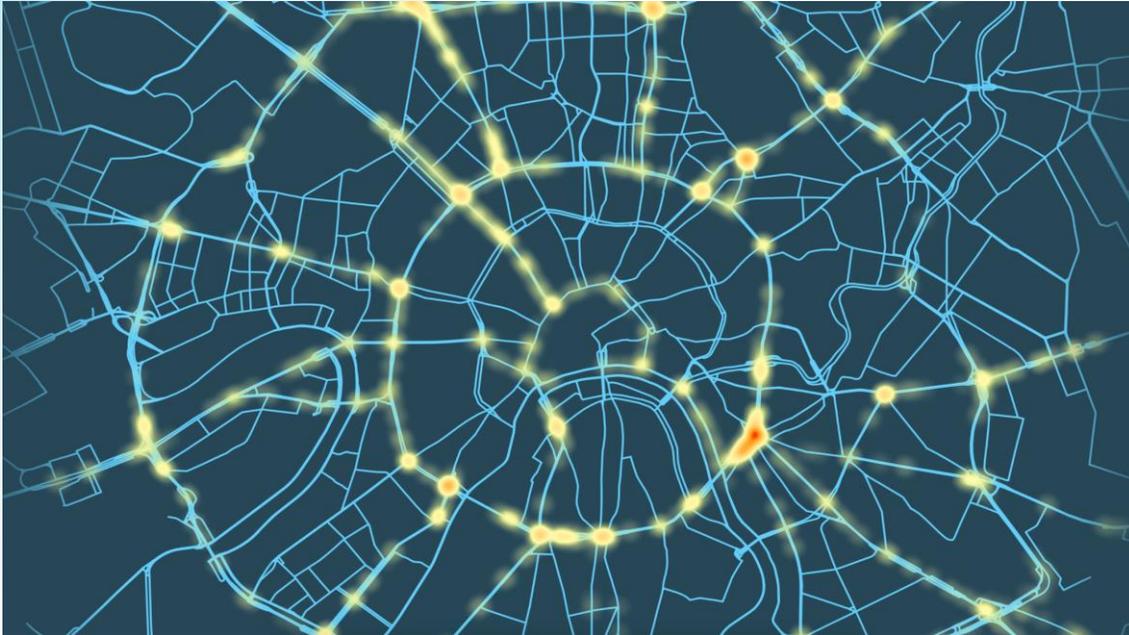
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TRACSENSE CLOUD

- Meteorological data aggregation
- Weather-based friction modelling
- Complemented with field data (car sensors)

THREE TIME HORIZONS

- Local measurements (real-time)
- Global friction prediction
- Next-mile friction prediction

THE DANGER OF TECHNOLOGY: HUMAN-MACHINE INTERACTION

**Computers taking over tasks from humans**

- Poor understanding of the system limitations
- Increased reliability → Increased reliance → Less critical

**Vehicle automation? Nothing new!**

- Aviation industry successfully went through similar changes
- Increased certification standards
- Increased training on systems design and limitations



From: ET-AVJ . Wikimedia Commons (retr. Apr. 19)

**Training and certification standards are desperately needed for the safe and successful advancement of driver assistance systems on public roads.**

From: Firda, H. (retr. Apr. 19)

THANK YOU FOR YOUR ATTENTION



Tracsense AS

Gaustadalleén 21, 0349 OSLO

Org. nr. 453 72 389

ANTHONY R. HOVENBURG  
CEO

E: [anthony@tracsense.tech](mailto:anthony@tracsense.tech)

T: +47 468 54 450

<http://www.tracsense.tech>