



### TechTalk

Al enabled Autonomous Mobility - State of the art Al solutions on embedded hardware

### Introduction of the presenters

Balázs Lóránd PhD

Head of Location – AI Development Center Budapest Regina Deák-Meszlényi PhD Head of Deep Learning Methods



### Introduction and our approach



### Introduction



### Complexity of environment perception

### Factors changing from country to country

Traffic participants with high variability

Rare scenarios

**TechShow Around the World** 

### Software 1.0









## Approach



### Ingredients of AI enabled autonomous mobility



### **Compute capacity – Top automotive cluster in-house**



https://openai.com/blog/ai-and-compute/

### Data availability – Fleet and enourmous databases





- Large datasets power new Al solutions
- > Finding the right data Data mining

- > Data prepared for AI: Annotations
- Storing and versioning the data Data management

#### TechShow Around the World

# Model complexity – Significant amount of expertise

Increased model size, more layers result in better performance

New model designs improved on complexity-performance trade-off

Many years of internal development for embedded hardware utilization



### **Embedded hardware performance**

70

60

50

40

30

20

10

0

- Real-time: algorithms must be evaluated 15+ times/sec
- > Efficiently designed AI models are still complex
- Automotive grade embedded hardware had to reach high compute capacity at low power



Based on https://www.semiconductors.org/wp-content/uploads/2018/06/1\_2015-ITRS-20\_System-Integration.pdf

### All ingredients together – Network in training



### **Challenges of AI enabled Autonomous Mobility**



### Challenge of globality and variability of the environment



## **Challenge of data availability**



# **Challenge of being futureproof**



## Summary







# **THANK YOU!**