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## Cooperation project between Continental and BME

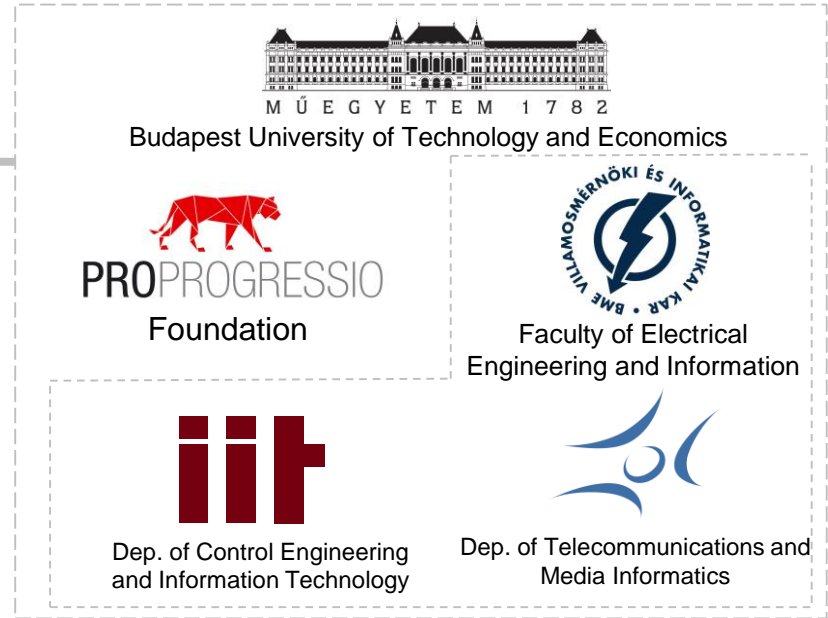


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# Professional Intelligence for Automotive PROJECT

**Continental**  
ADAS@BUDAPEST

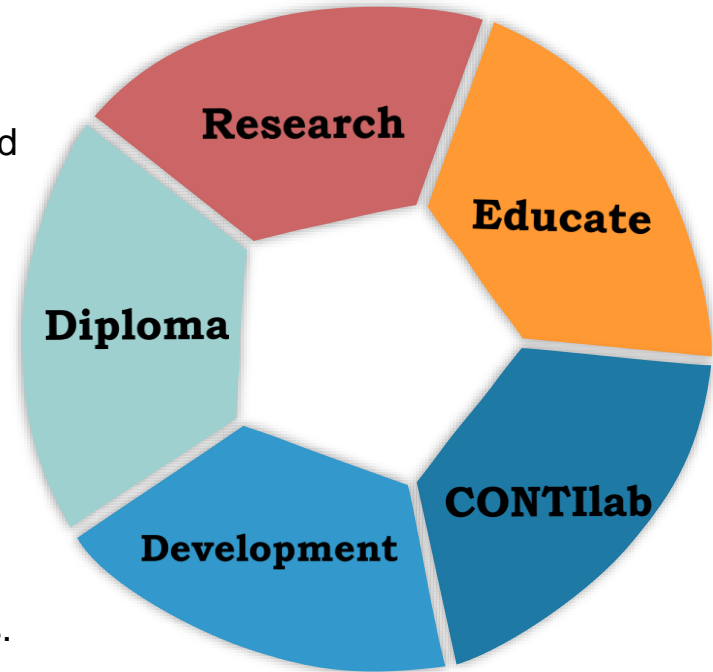
- Cooperation on research and development between Continental and Budapest University of Technology and Economics (BME)



# P<sub>rofessional</sub> I<sub>ntelligence</sub> for A<sub>utomotive</sub> PROJECT

Main objectives of the project are:

- Conduct researches in the field of deep learning and autonomous driving with academics and students.
- Provide education for students in the field of deep learning.
- Set up a laboratory with proper equipment for students (i.e. Duckietown, Workstations).
- Encourage development of applications on embedded systems.
- Conduct BSc, MSc and PhD degree oriented works.



# P<sub>rofessional</sub> I<sub>ntelligence</sub> for A<sub>utomotive</sub> PROJECT

- › Deep Learning
- › Reinforcement learning
- › Sensor fusion
- › Transfer learning
- › World models
- › Multi task learning
- › Object detection
- › Pose estimation
- › Autonomous driving



# P<sub>rofessional</sub> I<sub>ntelligence</sub> for A<sub>utomotive</sub> PROJECT

- › Teaching Deep Learning
  - › Courses
  - › Laboratory projects



# Professional Intelligence for Automotive PROJECT

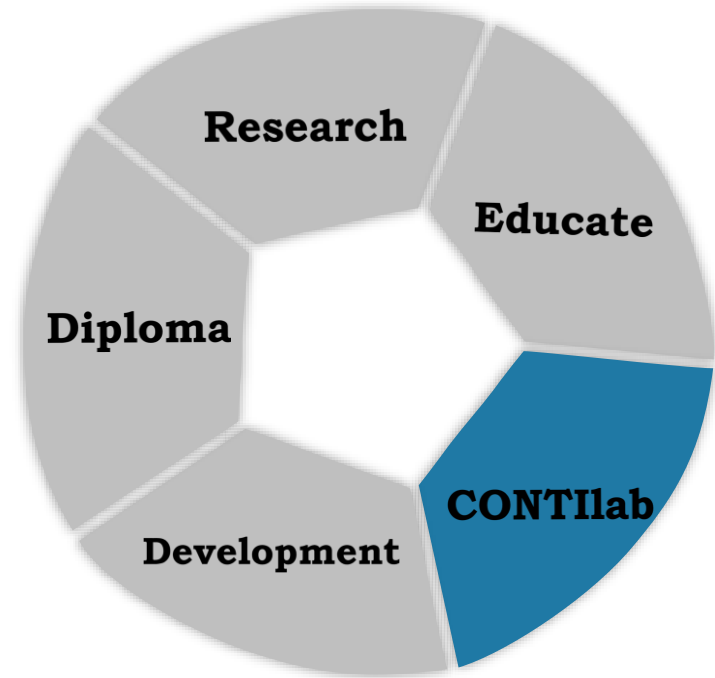
- › Continental laboratory equipped with
  - › 2 x high performance workstations (8 x 2080Ti GPU)



- › Duckietown environment
  - › 1 city with infrastructure (road signs, semaphores)
  - › 12 x duckie bots
  - › 12 x GPU Deep Learning accelerator



DUCKIETOWN



# Professional Intelligence for Automotive PROJECT



DUCKIETOWN

## › Duckietown

- › started as a class at MIT in 2016.
- › a worldwide initiative to realize a new vision for AI/robotics education.



Massachusetts  
Institute of  
Technology

## › Duckietown for education

- › The Duckietown platform designed as part of an a university AI/robotics curriculum.
- › It has been used in prestigious universities, such as MIT, ETH Zürich, and Université de Montréal.
- › “class-in-a-box” that comprises lectures, exercises, and theory, that combine with the physical robot platform to reinforce the core concepts.



Université  
de Montréal

TT  
IC TOYOTA  
TECHNOLOGICAL  
INSTITUTE  
AT CHICAGO

ETH zürich

# Professional Intelligence for Automotive PROJECT

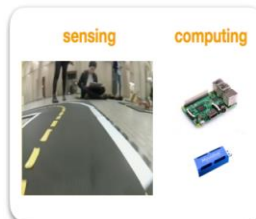


DUCKIETOWN

## > Duckietown for research

- > The Duckietown platform has also been used extensively for research on mobile robotics and physically embodied AI systems.
- > Participation in leading deep learning and robotics conferences like **NIPS** (Neural Information Processing Systems) and **ICRA** (International Conference on Robotics and Automation)

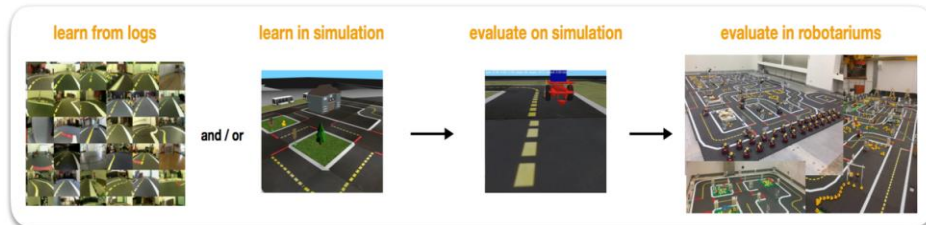
### Platform



### Challenges



### Reproducible Learning Protocol



## The AI Driving Olympics

AIDO 1: The first *embodied learning* competition at NIPS 2018  
AIDO 2: Second edition at ICRA 2019



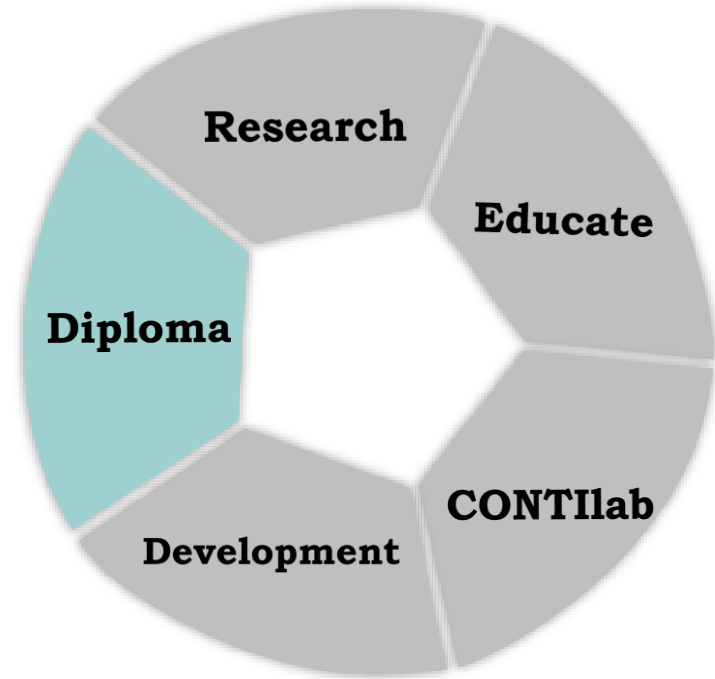
# P<sub>rofessional</sub> I<sub>ntelligence</sub> for A<sub>utomotive</sub> PROJECT

- › State of art deep learning application development
- › Training on workstations
- › Duckietown robot application development on embedded hardware
- › Running trained models on GPU Deep Learning Accelerator hardware



# **P**rofessional **I**ntelligence for **A**utomotive **PROJECT**

- › Providing a framework within research, university degree oriented work and project laboratory work is contemplated to be carried out for BSc, MSc students led by a PhD student funded by the PIA project.
- › Offering positions for graduates in our work environment.
- › Internship program.



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# THANK YOU!