



LATVIJAS  
UNIVERSITĀTE

ELEKTRONIKAS UN  
DATORZINĀTŅU  
INSTITŪTS



INSTITUTE OF  
ELECTRONICS AND  
COMPUTER SCIENCE

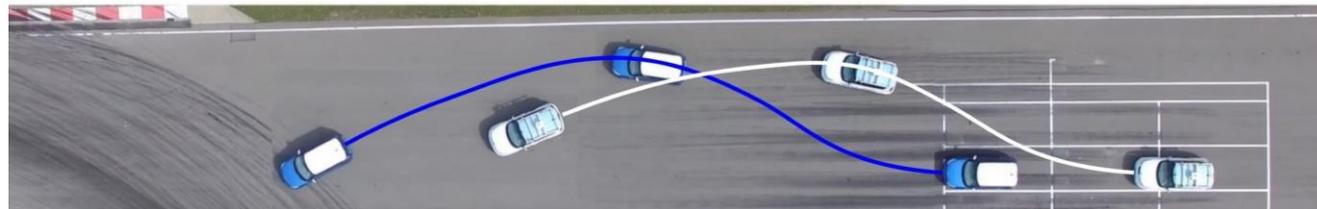
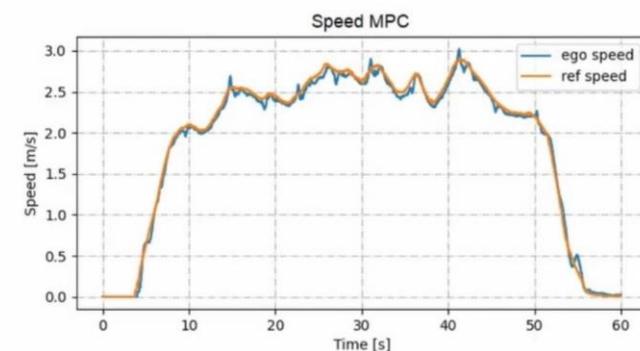
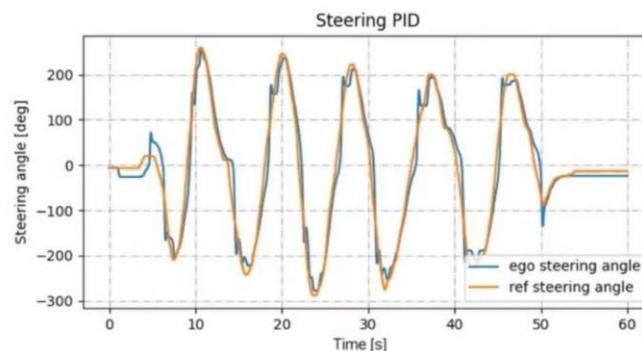
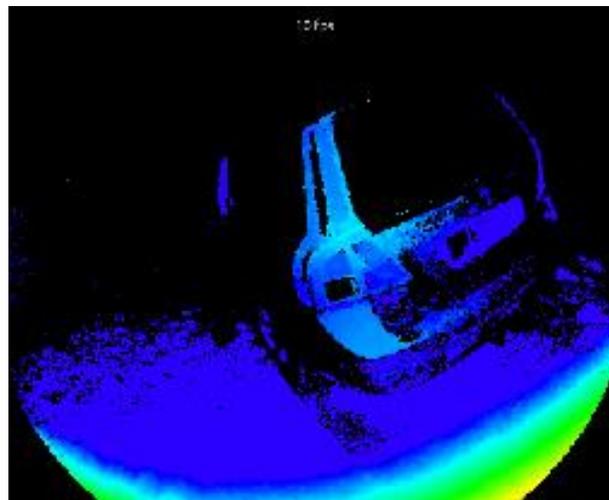
# My progress so far

Oskars Teikmanis

5th semester

# Recap of last time

- Since September 2021:  
Research assistant at the Institute of Electronics and Computer Science (EDI) and doctoral student at the University of Latvia
- Presented last time:
  - Work within 5G-ROUTES and ~~AI4CSM~~
  - Publication plan for self-driving vehicle
  - Upcoming project (VPP/MOTE)



# 5G-ROUTES



- Publication: **Automated Vehicle Platform with Connected Driving Capabilities**
- Authors: **Oskars Teikmanis, Aleksandrs Levinskis, Andris Ivars Mackus, Artis Rušīņš, Amr Elkenawy, Marta Tropa, Modris Greitans**
- Presented at the **IEEE International Conference on Intelligent Transportation Systems** in Bilbao, Spain





supported by  
tecnalia



26<sup>th</sup> IEEE International Conference  
Intelligent Transportation Systems  
September 24<sup>th</sup> - 28<sup>th</sup>, 2023  
Bilbao, Spain



# MOTE (VPP-EM-FOTONIKA)



- Current work:
  - Research and develop algorithms for the application of differentiable physics for precise air flow control
  - Extended abstract
  - Concept of physical device
  - Compile information for at least one publication



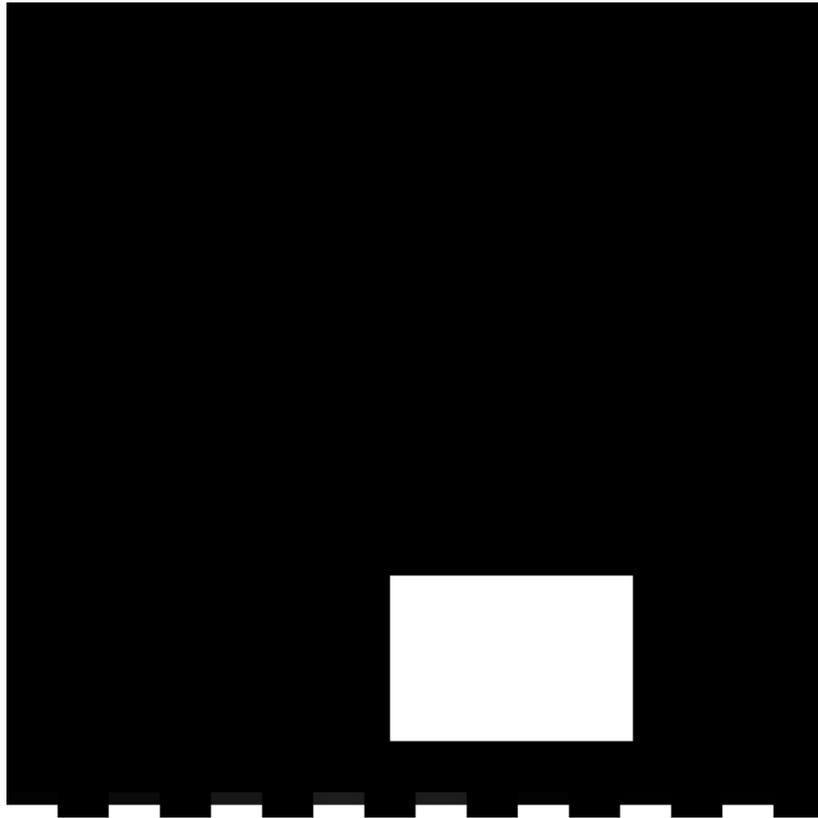
Move objects with air flow from below



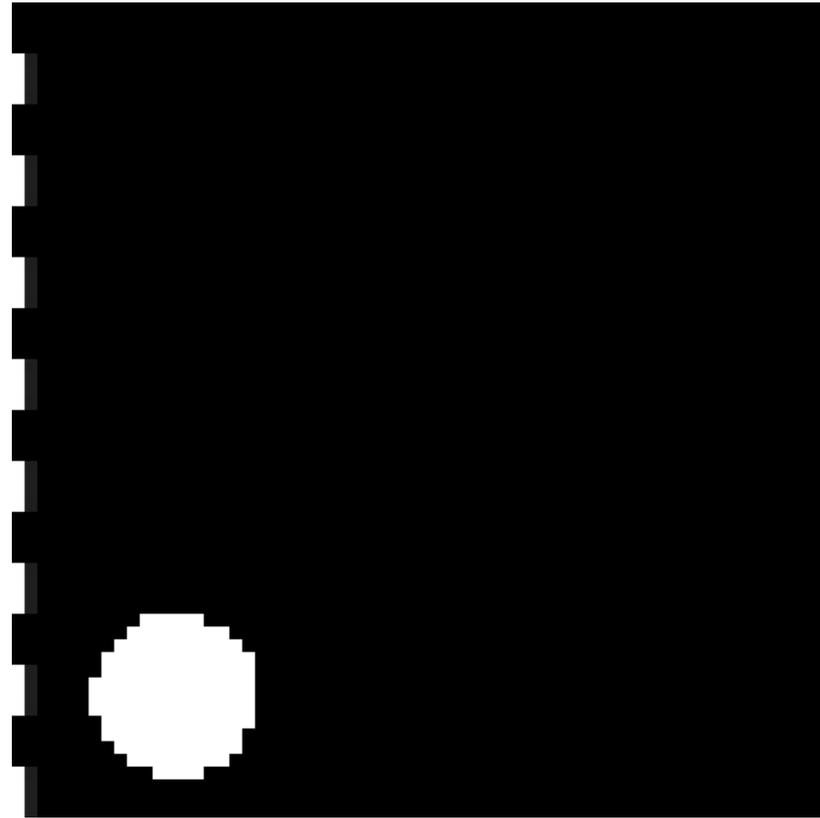
Lift objects with concentrated water streams



# MOTE



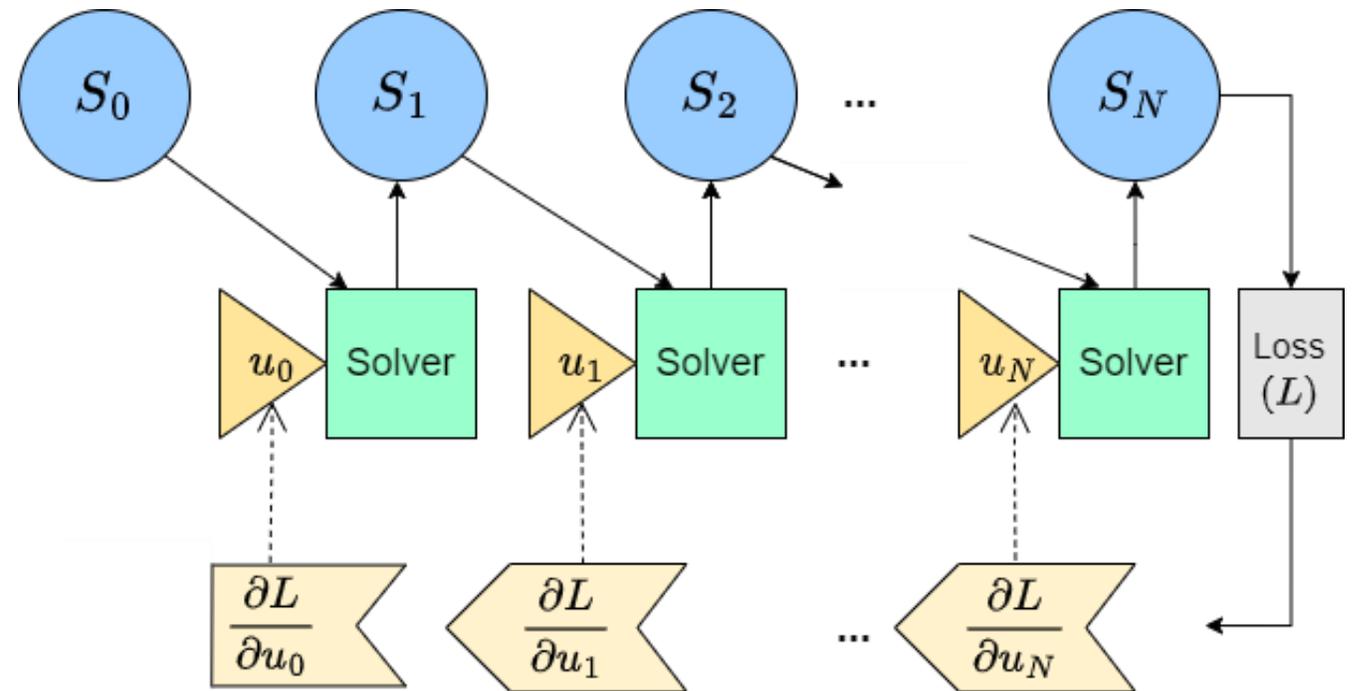
Object moved sideways with vertical flows



Object moved upwards with horizontal flows



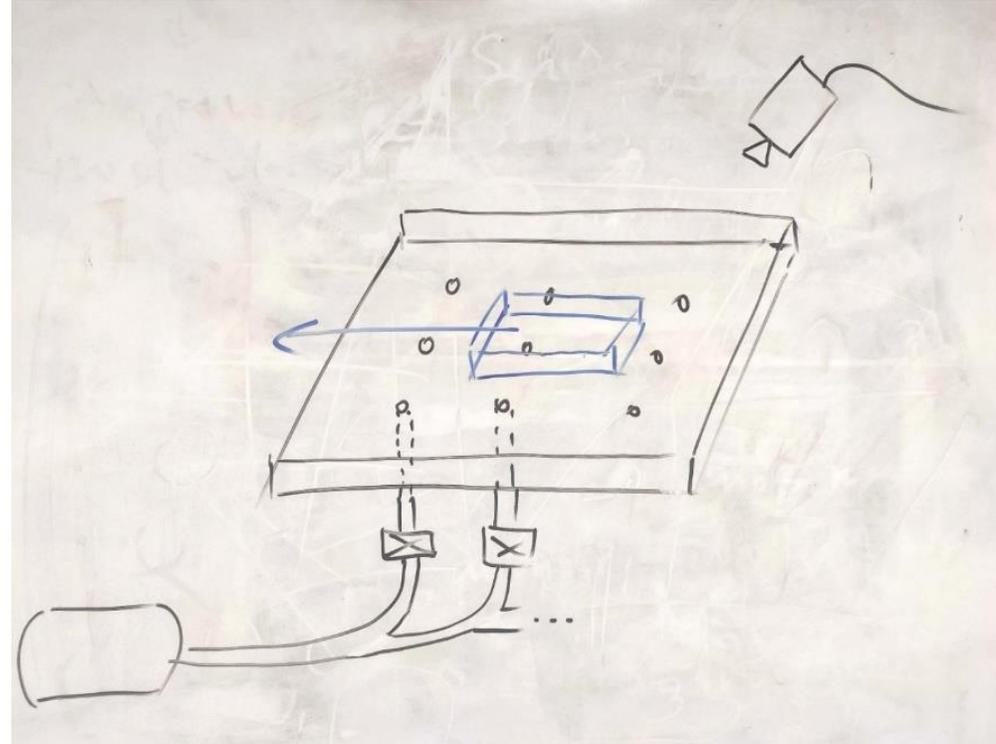
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Method architecture (presented at IWoEDI 2023)\*

\*Applying a Differentiable Physics Simulation to Move Objects with Fluid Streams  
Oskars Teikmanis, Laura Leja, Karlis Freivalds, IWoEDI 2023

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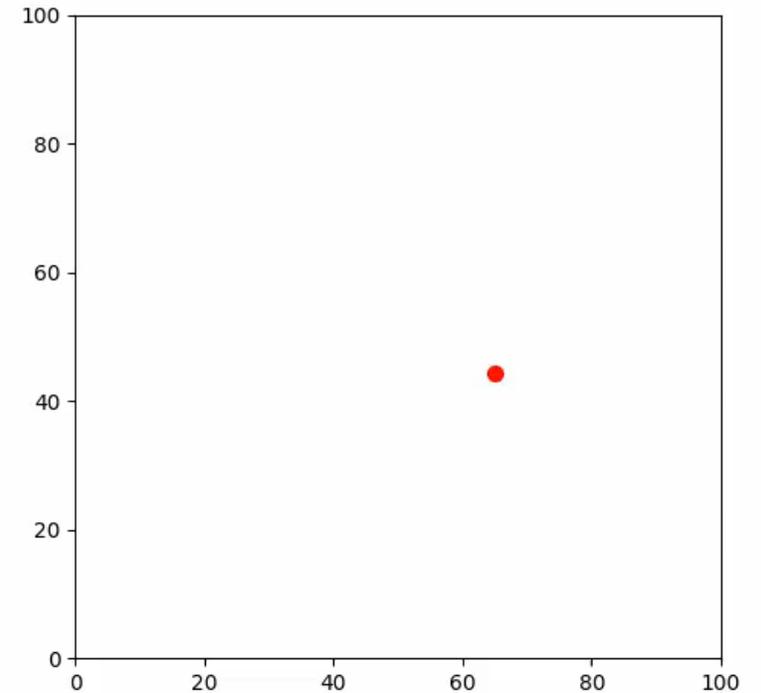
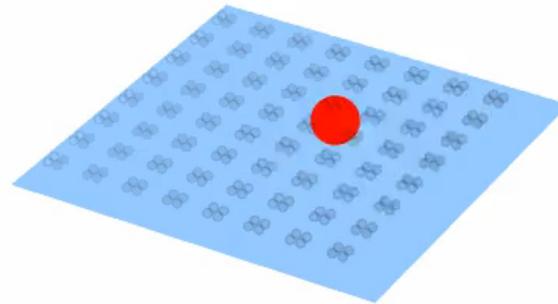


Concept drawing of the device

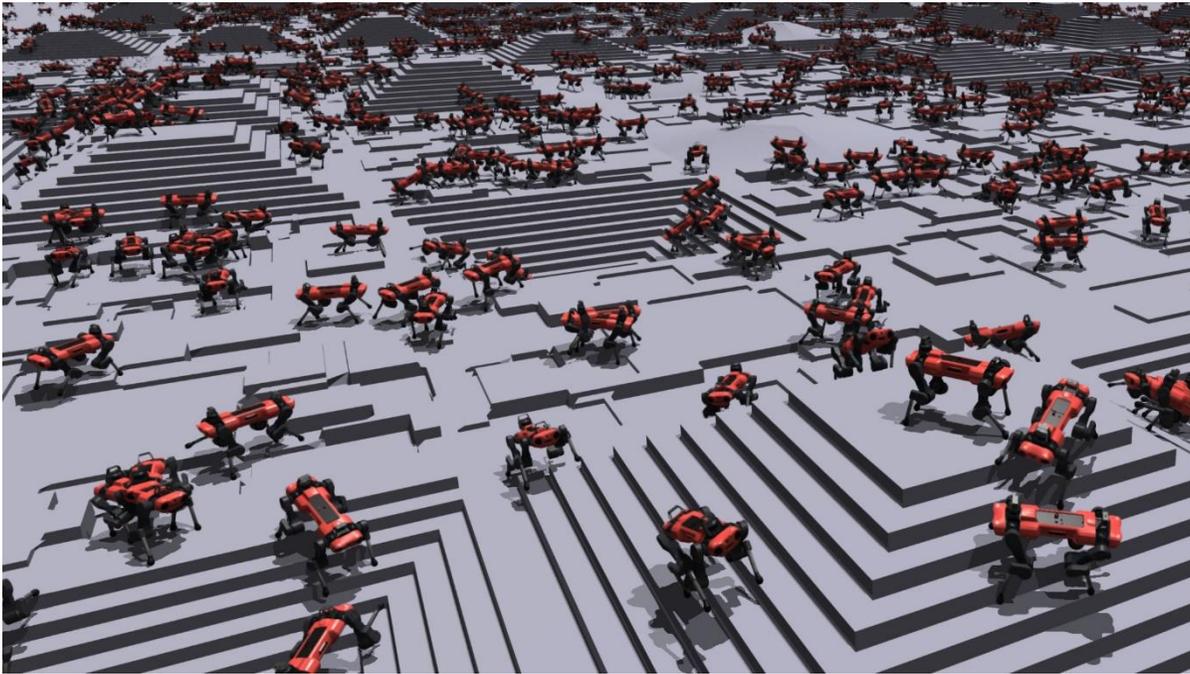
# MOTE



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# Additional work: quadrupedal robots



Rudin *et al.*, CoRL 2021



Unitree Go2 quadruped

# Q&A

