

Advanced Topics in Artificial Intelligence & Machine Learning

Embodied AI: Self-Driving

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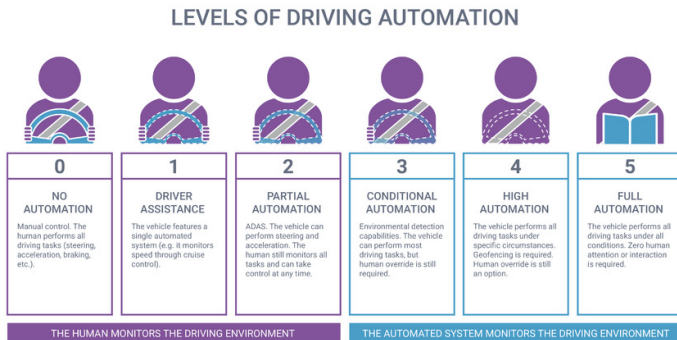
Embodied AI

- *Embodied AI* means *AI for virtual **robots***
- *Embodiment hypothesis*: intelligence emerges in the interaction of an agent with an environment and as a result of sensorimotor activity
- *Sim2Real*: an approach to train embodied agents in realistic simulators and then transferring the learned skills to reality
- Read material: [link](#)



Automation Levels

- Automation Levels: a formal approach to distinguish properties of AI in the driving task
- North star is L5 and limited but still fully functional AI starts with L4 (and even L3 w/ human assistance during fallback)
- Read material: [link](#)



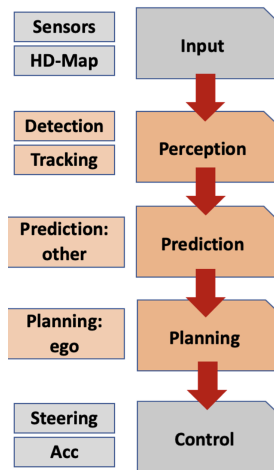
Brief History of Autonomous Driving

- The main place of research: Stanford — Stanford Cart, Shakey the Robot (1960s), Stanley the Vehicle (2005)
- The main source of challenges: DARPA Grand and Urban Challenges (2004–2007)
- Read material: [link](#)



Self-Driving

- Self-driving (or Autonomous Driving) is a super challenging area comprising literally all the ML Research directions. The main concern is safety that comes through the robustness and generalization
- Highly dependent on the training/eval data, hardware used, settings etc. — that's why there is no open self-driving model (at least, now)
- Main modules are Mapping, Perception, Prediction, Planning, Control
- Read material: [link](#)



Takeaway notes

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- ➋ Embodied AI is one of the promising (but still not fully solved) cases to AGI
- ➌ Self-driving is a super challenging task (fully not solved yet)
- ➍ Autonomy stack is an approach to decompose the self-driving task

Takeaway notes

- ➊ Read all the mentioned links
- ➋ Embodied AI is one of the promising (but still not fully solved) cases to AGI
- ➌ Self-driving is a super challenging task (fully not solved yet)
- ➍ Autonomy stack is an approach to decompose the self-driving task
- ➎ Unclear when we will have L5 systems on the road: probably the complexity is the same as building AGI

Thank you!