

# The Role of AI: Dancing with Remote People and Machines

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# What is AI?



- **Intelligence:**
  - “The ability or inclination to perceive or deduce information, and to retain it as knowledge to be applied towards adaptive behaviors within an environment or context”
  - **“Finding what to do – if you do don’t know what to do”**
- **Artificial Intelligence (AI)**
  - “Intelligence” exhibited by machines
  - **Study of “Intelligent/Autonomous Agents or Systems”**

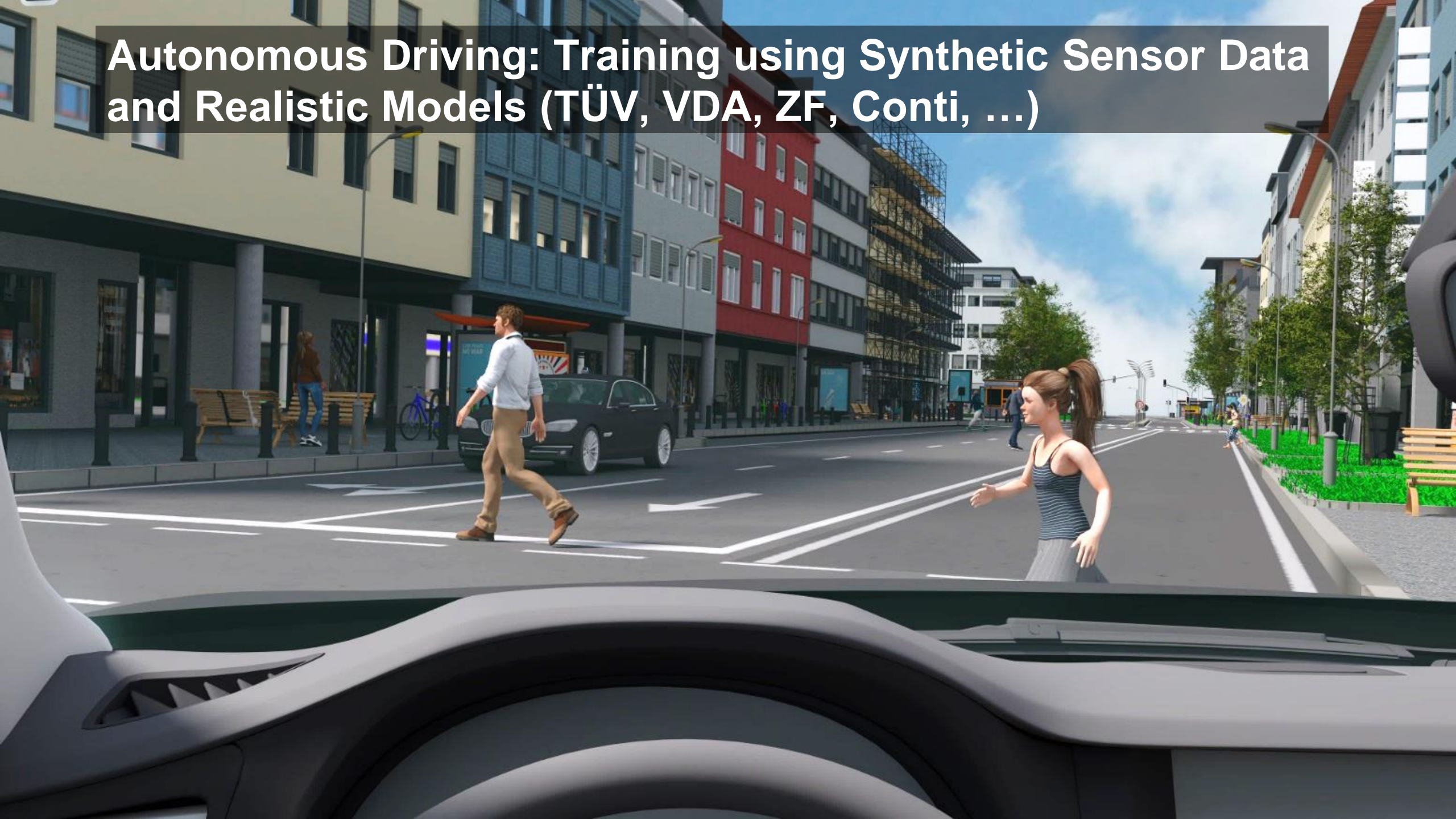
# What is AI?



- **Elements of AI Systems (“See – Think – Act” Paradigm):**
  - **Perception**
    - ... to find out what the world around “looks” like (incl. digital sources)
  - **Machine Learning (Deep Learning)**
    - ... to automatically build/adapt models of reality
  - **Knowledge Representation**
    - ... to represent, process, and communicate *models of the environment*
  - **Reasoning**
    - ... to generalize and infer new models based on existing and new knowledge
  - **Planning**
    - ... to plan and simulate in the virtual world, exploring possible options, evaluating their performance, and making decisions
  - **Acting**
    - ... to manipulate and move around in the real/virtual world – and start over!!
  - Supporting Functionality
    - Validation/Verification, Security, Ethics/Social Aspects, SW/HW-Platform, etc.
  - AI Applications

Data  
Science

# Autonomous Driving: Training using Synthetic Sensor Data and Realistic Models (TÜV, VDA, ZF, Conti, ...)



# Perception of the World: Humans vs Machine



- **Long history in motion research (>40 years)**
  - E.g. Gunnar Johansson's Point Light Walkers (1974)
  - Significant interdisciplinary research (e.g. psychology)
- **Humans can easily discriminate different styles**
  - E.g. gender, age, weight, mood, ...
  - Based on minimal information
- **Can we teach machines the same?**
  - Detect if pedestrian will cross the street
  - Parameterized motion model & style transfer
  - Predictive models & physical limits

