

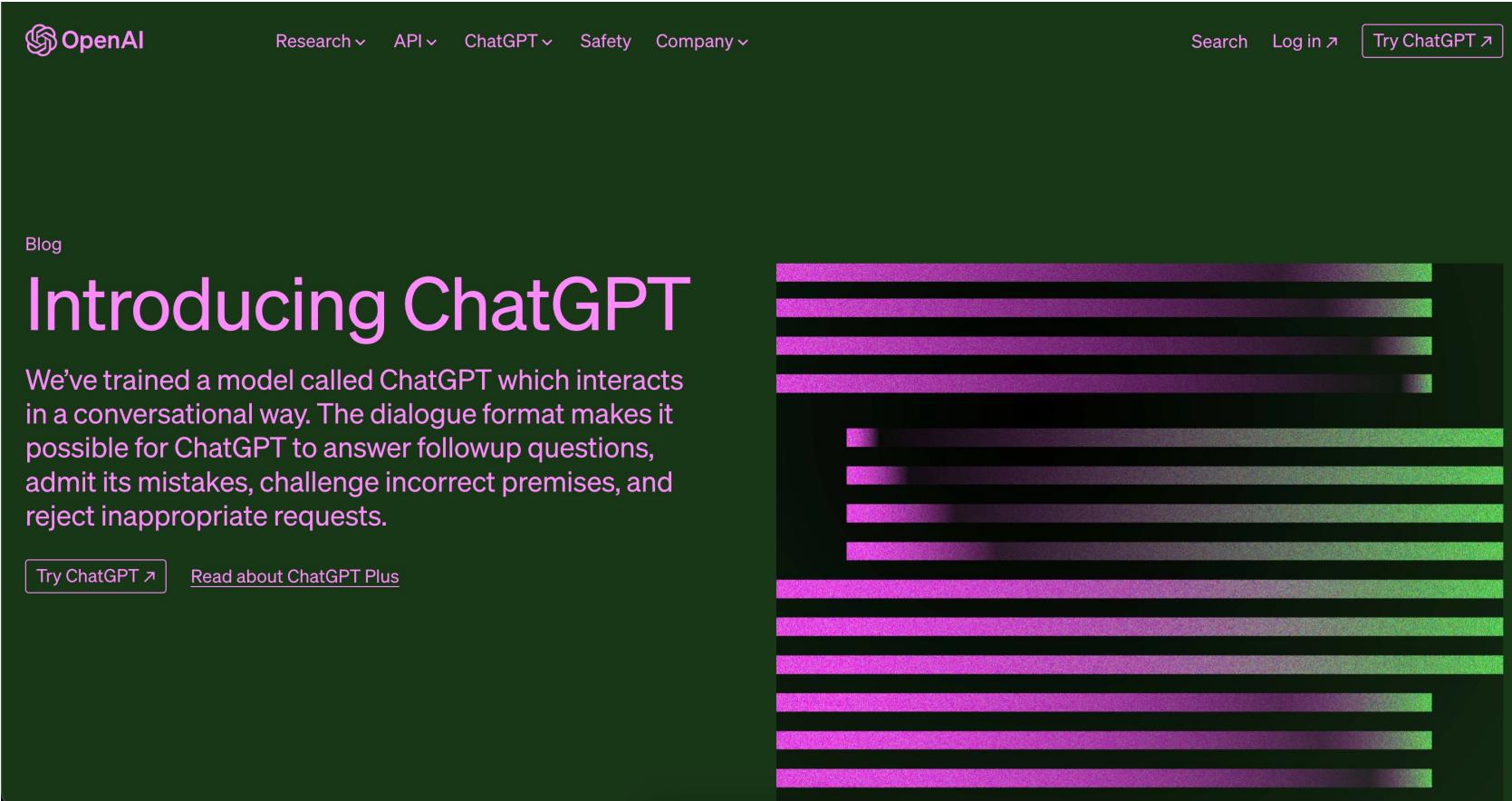
# Real-World Humanoid Control with Transformers

Ilija Radosavovic

UC Berkeley



# Digital AI is changing the world



The image is a screenshot of the OpenAI website's homepage. At the top, there is a large, bold title "Digital AI is changing the world". Below this, the OpenAI logo is visible, along with navigation links for Research, API, ChatGPT, Safety, and Company. On the right side of the header are buttons for "Search", "Log in", and "Try ChatGPT". The main content area features a dark background with a grid of colored bars (purple, green, yellow) at the bottom. The text "Blog" is displayed above the main heading. The main heading itself is "Introducing ChatGPT", followed by a descriptive paragraph about the model's conversational abilities. At the bottom of this section are two buttons: "Try ChatGPT" and "Read about ChatGPT Plus".

Blog

## Introducing ChatGPT

We've trained a model called ChatGPT which interacts in a conversational way. The dialogue format makes it possible for ChatGPT to answer followup questions, admit its mistakes, challenge incorrect premises, and reject inappropriate requests.

[Try ChatGPT ↗](#) [Read about ChatGPT Plus](#)

Real-World AI will even more so

# What might it look like?



How do we get there?

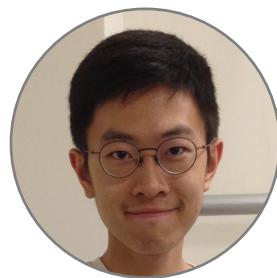
# Real-World Humanoid Locomotion with Reinforcement Learning



Ilijia Radosavovic\*



Tete Xiao\*



Bike Zhang\*



Trevor Darrell+ Jitendra Malik+ Koushil Sreenath+



University of California, Berkeley



Berkeley  
UNIVERSITY OF CALIFORNIA

# Humanoid Control with Transformers



Causal Transformer



Massively Parallel Training in Simulation



Zero-Shot Transfer to the Real World



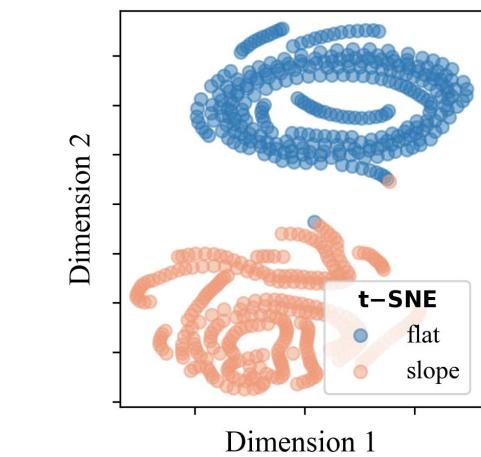
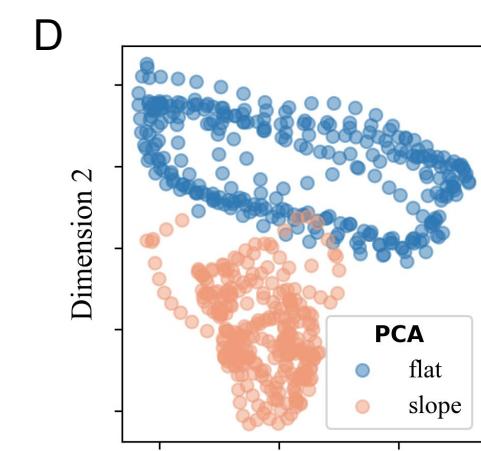
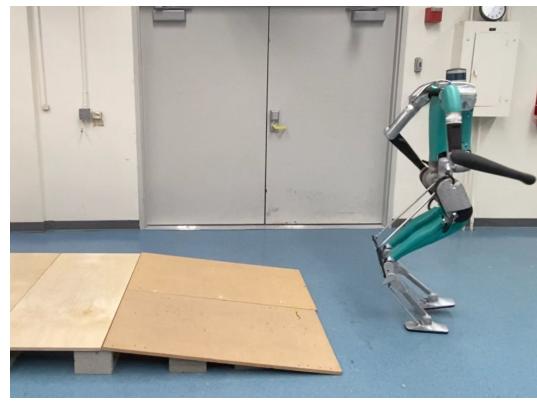
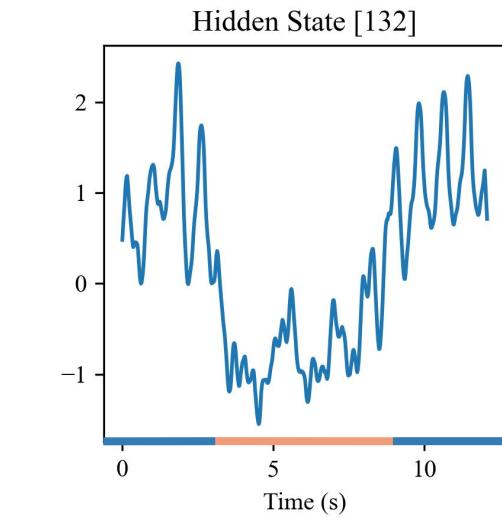
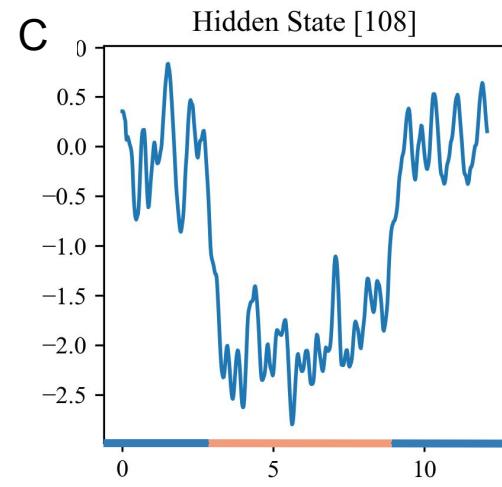
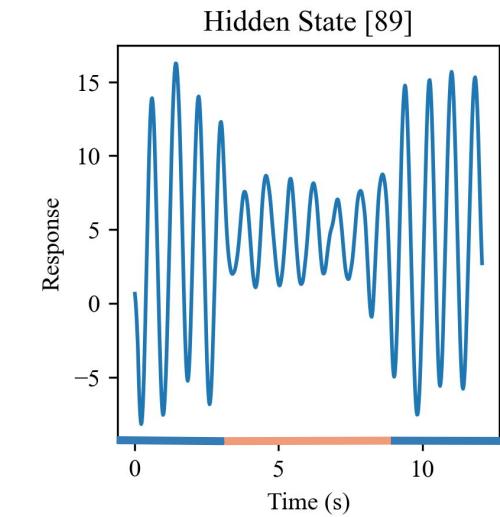
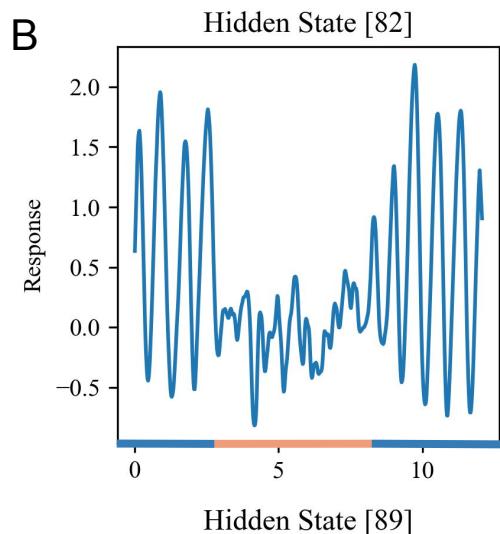
Omnidirectional Walking



Emergent Arm Swing

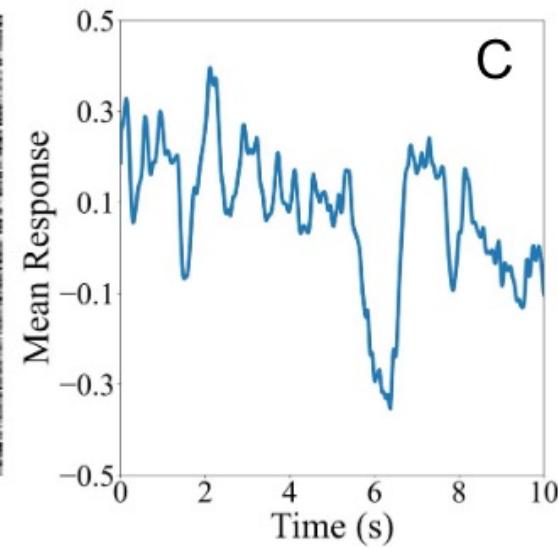
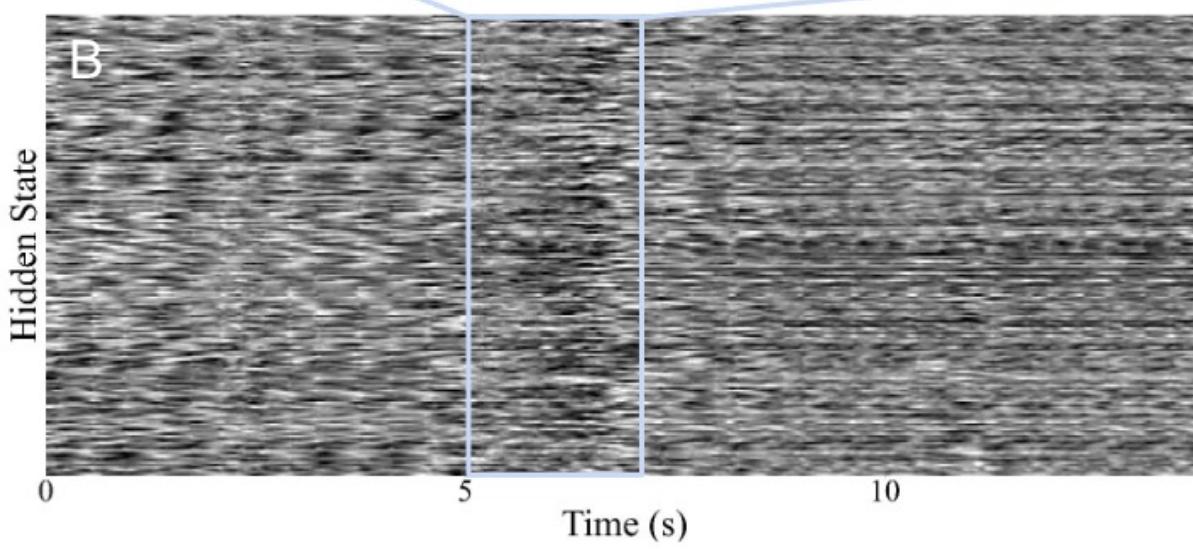
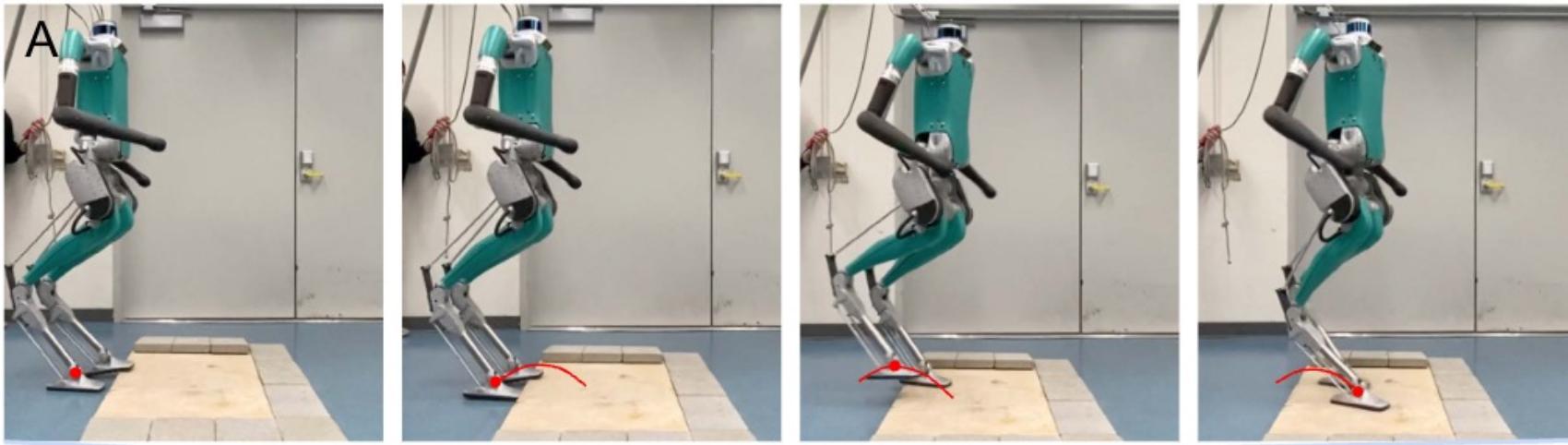


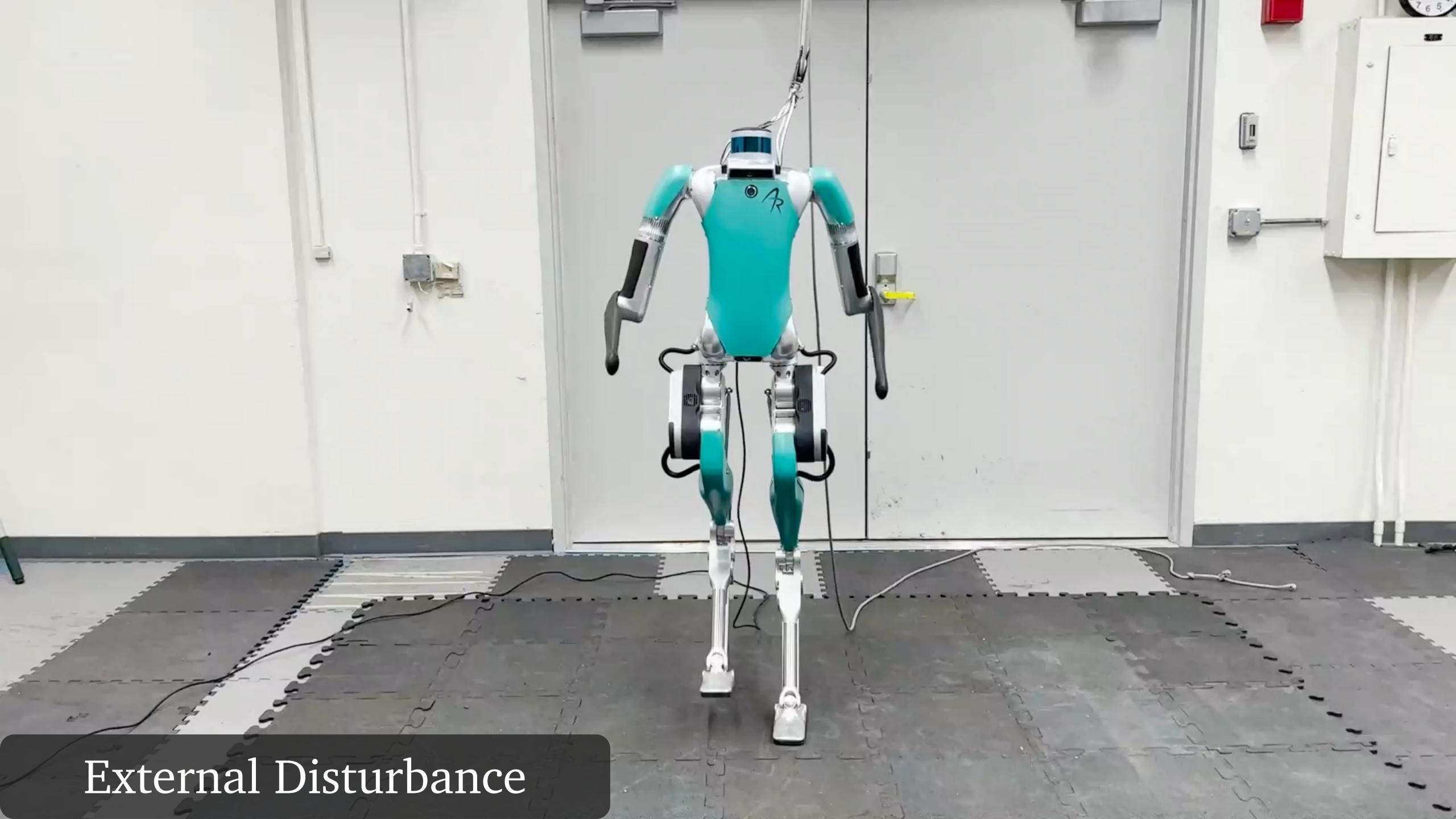
In-Context Adaptation





Foot-trapping Recovery





External Disturbance

# Takeaways

1. A fully learning-based approach
2. Massively parallel training in simulation
3. In-context adaptation with Transformers
4. Zero-shot transfer to the real world



Berkeley  
UNIVERSITY OF CALIFORNIA