Bias in AI:

Even Robots Show It as They Walk Across the Stage

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Summary

A breakthrough in how a robot walks is greatly biased. Such bias was not intended, but it is present. Let's caveat technology breakthroughs and not rush them to consumer products.

A Robot Walks With a Natural but Biased Gait

Chinese robotics startup EngineAI recently showed its new SE01 robot walking about the stage [1] [2]. The SE01 is notable for its natural, human-like walking gait. This gait or walking style distinguishes it from other humanoids that plod along with a steady but clumsy motion. Technical details are unavailable, but the gait is achieved via reinforcement learning, neural networks, Sim2Real transfer (simulations are transferred to the real-world robots), and advanced torque management and precise movement.

What is not noted in early "wow" articles is the inherent bias in the walking gait of the robot.

Researchers of human gait have shown differences due to factors such as age [3] [4], gender [5] [6], culture [7] [8], and even how different cultures perceive gait differently [9].

The "naturally walking" robot is full of bias. My layman's guess is the robot mentioned herein walks like a healthy young adult male from Asia: bias everywhere (including my layman's guess).

Early Technology Breakthroughs Are Often Deeply Flawed

Early technology breakthroughs are just that: early.

These breakthroughs are often impressive to narrow-minded technologists. As a student of AI and robotics, I am greatly impressed by the breakthrough achieved by the scientists and engineers at EngineAI. It is amazing.

Often, however, technology breakthroughs are deeply flawed when examined closely or from a distance. Close examination by kinesiology (the scientific study of human movement, encompassing its mechanics, anatomy, physiology, and the factors that influence it, with applications in areas like sports medicine, rehabilitation, and exercise

science) researchers would highlight the “humanness” of the robot’s gait and describe the fine points of the improvements. They would also pinpoint remaining areas of improvement.

A quick look from a distance would also indicate the bias in the robot’s gait. Quick looks would bring quick questions like: Male or female? Athlete? Demonstrating health or injury? Age? Culture?

AI scientists and mechanical engineers are narrowly focused on AI and mechanics. They (we) don’t understand kinesiology, biology, health, and culture. Some may know something of these other fields, but as the saying goes, “A little knowledge can be a dangerous thing.”

EngineAI’s breakthroughs are real and impressive. Their marketing, however, is deeply flawed.

Caveat Technology Breakthroughs

In the future (and present), let’s caveat technology breakthroughs. This is often a management and financial act. Financial backers want quick and quicker returns on their investments.

Claiming, “Hey, we have a robot that really walks like a person. People will want to buy this robot,” is great for the internal briefings. It is not, however, good for the product demonstration at a trade show.

Stating, “This is new. There are problems, and we are working on them, but we wanted to show you what we have so far,” as a preface is in order.

Sending the output of a graduate student’s lab project to consumers is foolhardy. It is also foolhardy to send the output of research and development to consumers backed by a full marketing campaign. I am not accusing EngineAI of either, but I have seen these practices many times.

References

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