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Assignment 02 – Recent Advancements and Future Trends in AI

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Part 1: AI Advancements

1. Soft Robotics

Soft robotics is inspired by the movements and capabilities of biological organisms and has become a cutting-edge branch of robotics. Made from flexible materials, these robots use soft actuators, sensors, and artificial muscles to interact safely with humans and other fragile objects. In this, AI plays a critical role in assisting these robots adapt to multiple tasks and environments by learning from feedback. Unlike traditional hard-shelled robots, soft robots are ideal for applications that require precise movements such as in healthcare and food processing. The ability to conform to various shapes and safely handle delicate items makes them groundbreaking, as a soft robotic arm can assist surgeons in performing surgeries with enhanced precision. Beyond healthcare, the future of soft robotics could also revolutionize areas like agriculture, where robots need to handle certain crops gently to avoid damage.

2. Vision Transformers (ViTs)

As transformers have been a large part of natural language processing, they have been making their way into computer vision. Similar to how words are treated in NLP models, ViTs process images by breaking them down into smaller sections as a “token”. This allows them to make better predictions or classifications by considering how different parts of the image are related even if they are far apart in the image. As CNNs have been the gold standard in CV, they tend to miss the larger relationships between different parts of the image. With ViTs, the future impact could enhance autonomous systems, as vehicles and drones could eventually make better decisions based on a larger understanding of their surroundings.

3. AI-Generated Art

DALL-E, from OpenAI, uses text input and creates detailed images. By understanding the context of the text and transforming it into a visual representation, DALL-E can create many different scenes from elaborate photorealistic landscapes to abstract illustrations. The current version offers enhanced precision and can generate images previously thought to be beyond the reach of AI. It can also capture more details like emotion and textures. The future of DALL-E is set to enhance industries from game design and marketing, as it could be used to create virtual environments in games or custom illustrations for advertisements.

Part 2: Comparing Regulations

Australia:

Australia has been developing frameworks to ensure AI progresses ethically while minimizing risks. Released in 2019, the AI Ethics Framework, outlines eight key principles, such as fairness, transparency, and accountability. Australia pushes self-regulation and inter-industry collaboration, expecting businesses to voluntarily adopt the practices. They also focus on managing risks in the healthcare and transportation sectors and fostering new innovation through partnerships. The overall thought is trying to balance AI development responsibly with staying globally competitive.

Australia’s regulatory framework would be the relaxed but sensible sidekick who would push the exploration of potential but would step in realign when things start to get off course. It is all about being flexible and working together, like letting someone do their thing while keeping an eye out for any major deviations.

European Union:

Proposed in 2021, the EU AI Act, is more a get ahead proactive and comprehensive approach. It classifies AI systems based on their risk levels, ranging from minimal to high, placing tight requirements on high risk systems in healthcare, law enforcement and transportation, ensuring safety, fairness, and transparency. This approach is in line with upfront regulations in which avoid potential issues before they occur.

The EU’s regulation would be the overly cautious with a copy of the rules and regulations, making sure AI follows every guideline as well as making sure their t’s are crossed and i’s dotted. If AI were about to do something questionable, it would step in and reference the rulebook. This means no reckless actions, but everything would be safer as a result.

The AI Takeover:

Australia’s approach seems like it would be thoughtful and considerate, talking with the AI and working through the issues that might be leading it down a bad path. On the other hand, the EU might not have let the issue get large enough, as it seems like it could have blocked it immediately and raised alarms quicker.

Part 3: Future Trends

AI in the Workplace

In the coming decade, AI systems are likely to shift from being just tools to becoming collaborators or even making decisions in the workplace. As AI can handle complex tasks like data analysis and customer service, the future of AI could be that of supervision or team management, as AI driven systems could schedule projects, evaluate performances, and hire new employees based on data. Both Australia and the EU would both need to ensure that these roles operate and maintain transparency and fairness. For Australia, they might need to create frameworks that focus on ethical decision making in the workplace. On the other hand, the EU might need to broaden its regulations to understand employee rights and collaboration. The EU’s AI Act has focused on hiring algorithms as ‘high-risk’, but they may need tighter rules on human oversight and accountability. Being more flexible, Australia has a bit more room to introduce new concepts into regulations. In the end, both will have to straddle the fine line that is workplace efficiency and worker rights.

AI Integration into Everyday Life

As technology becomes more intelligent and personalized, the big question becomes privacy and data security. Both regions will have to implement safeguards to protect personal data. The EU currently has strict data protection laws, but they may need to update them as things become more autonomous and Australia may need to strengthen its policies to ensure devices don’t undermine privacy rights. With stringer regulations, the EU might be in a better position to handle new issues, but both would benefit from faster regulatory actions to keep up with the pace of evolution.

The Path Forward

While both are taking steps to safeguard consumers, the future will likely challenge them further and as AI becomes more embedded in our everyday lives, they will need to quickly adjust their core to keep up with emerging trends. They must also collaborate internationally, as to not stifle innovation or create regulatory loopholes, making sure their approach is in alignment with other major economies like the U.S. and China.

Refences:

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