-
- **Environmental sustainability is the concept of preserving natural resources and ecosystems for future generations by balancing economic, social, and environmental needs. In the context of modern technologies, it involves assessing the environmental impact of these technologies throughout their lifecycle, from their production to their disposal.**

1. **5G: 5G technology** can help reduce energy consumption and greenhouse gas emissions by enabling more efficient communication and data transfer. However, the increased use of devices that rely on 5G connectivity can contribute to electronic waste and the depletion of natural resources.

2. **Additive manufacturing:** Additive manufacturing, or 3D printing, has the potential to reduce waste and energy consumption in manufacturing processes. However, the production of 3D printers and the use of materials such as plastics can have negative environmental impacts.

3. **Artificial intelligence:** Artificial intelligence (AI) can help optimize energy use and reduce waste in industries such as transportation and manufacturing. However, the energy consumption associated with training and running AI models can also have negative environmental impacts.

4. **Augmented and virtual reality:** Augmented and virtual reality technologies can reduce the need for physical travel and facilitate remote work, thereby reducing greenhouse gas emissions. However, the production and disposal of devices and materials required for these technologies can have negative environmental impacts.

5. **Big data analytics:** Big data analytics can be used to optimize energy consumption and reduce waste in various industries. However, the energy consumption associated with processing and storing large amounts of data can also have negative environmental impacts.

6. **Blockchain:** Blockchain technology can help increase transparency and traceability in supply chains, thereby reducing waste and environmental harm. However, the energy consumption associated with the computational power required to operate blockchain networks can also have negative environmental impacts.:
    - transparent and immutable record of every step of the supply chain process
    - But energy consumption associated with the computational power required to operate blockchain networks can also have negative environmental impacts. Blockchain relies on complex algorithms and a distributed network of nodes to verify and record transactions.

7. **Cloud computing:** Cloud computing can help reduce energy consumption and greenhouse gas emissions by allowing for more efficient use of computing resources. However, the energy consumption associated with operating data centers that support cloud computing can also have negative environmental impacts. **cons = energy consumsupion**

8. **Digital twin:** Digital twin technology can help optimize energy use and reduce waste in various industries. However, the energy consumption associated with the development and use of digital twin models can also have negative environmental impacts.
9. Digital twin is a virtual replica or model of a physical asset, system, or process that can be used for various purposes such as product design, monitoring, and optimization. It's essentially a digital representation of a physical object or system that is created using real-time data from sensors, cameras, and other sources.
10. Digital twin technology can be used in various industries such as manufacturing, aerospace, energy, and healthcare, to improve efficiency, reduce costs, and optimize performance. By using digital twin technology, companies can create a virtual model of their assets or processes and use real-time data to optimize their performance, reduce waste, and save energy.
11. For example, in the manufacturing industry, digital twin technology can be used to simulate the production process, identify inefficiencies, and optimize energy use to reduce waste and improve sustainability. Similarly, in the energy sector, digital twin models can be used to optimize energy pro

12. **Edge computing:** Edge computing can reduce energy consumption and greenhouse gas emissions by enabling more efficient data processing at the network edge. However, the production and disposal of devices required for edge computing can have negative environmental impacts.

13. **Internet of things:** The internet of things (IoT) can help optimize energy use and reduce waste in various industries. However, the production and disposal of IoT devices can have negative environmental impacts, as can the energy consumption associated with the data processing and communication required for IoT.

14. **Robotics:** Robotics can reduce energy consumption and greenhouse gas emissions by enabling more efficient and precise manufacturing processes. However, the production and disposal of robotic devices can have negative environmental impacts. **pro: optimze waste** **con: device disposal**

15. **Quantum computing:** Quantum computing has the potential to optimize energy use and reduce waste in various industries, but the energy consumption associated with the development and operation of quantum computers can also have negative environmental impacts.

- ∞ Technologies such as renewable energy, energy storage, and electric vehicles have significant potential for reducing greenhouse gas emissions and improving energy efficiency, as they directly address the sources of carbon emissions and energy consumption.
- ∞ Technologies such as 5G, artificial intelligence, and big data analytics have the potential to optimize energy use, reduce waste, and improve sustainability in various industries, but their impact may be more indirect and dependent on the specific use case.
- ∞ Technologies such as blockchain, digital twin, and edge computing have the potential to increase transparency, traceability, and efficiency in various industries, but their impact on environmental sustainability may depend on how they are implemented and whether they are designed with sustainability in mind.
- ∞ Technologies such as additive manufacturing, augmented and virtual reality, robotics, and quantum computing may have more limited direct impact on environmental sustainability, but they can still contribute to sustainability through increased efficiency, reduced waste, and improved product design.

#6 Blockchain is a digital ledger technology

- secure and transparent recording of transactions, and it has the potential to revolutionize various industries, including supply chain management.
- companies can create a transparent and immutable record of every step of the supply chain process, from sourcing raw materials to delivering products to customers.
- Increasing transparency and traceability to help reduce waste and environmental harm by identifying inefficiencies in the supply chain and improving overall sustainability.

Cons

- energy consumption associated with the computational power required to operate blockchain networks can also have negative environmental impacts.
- Blockchain relies on complex algorithms and a distributed network of nodes to verify and record transactions requuring a lot of computational power == significant energy consumption.
- energy consumption primarily due to the process of mining, which is how new transactions are verified and added to the blockchain. Mining requires specialized hardware and consumes a lot of electricity contributing to greenhouse gas emissions and other environmental harms.
- while has the potential to improve environmental sustainability in supply chain management, its energy consumption and potential negative environmental impacts must also be considered.

Pros

- Efforts are being made to make blockchain more energy-efficient, such as using renewable energy sources to power mining operations, or transitioning to proof-of-stake mechanisms that require less computational power than proof-of-work mechanisms.

#8 Digital twin technology

Digital twin technology is a virtual representation of physical assets, processes, or systems that can be used for various purposes, such as product design, performance optimization, predictive maintenance, and simulations. By using digital twin technology, companies can create a virtual model of their assets or processes and use real-time data to optimize their performance, reduce waste, and save energy.

For example, in the manufacturing industry, digital twin technology can be used to simulate the production process, identify inefficiencies, and optimize energy use to reduce waste and improve sustainability. Similarly, in the energy sector, digital twin models can be used to optimize energy production, distribution, and consumption, thereby reducing greenhouse gas emissions and improving energy efficiency.

However, the energy consumption associated with the development and use of digital twin models can also have negative environmental impacts. Developing digital twin models requires significant computing power, data storage, and data processing, which can consume a lot of energy and contribute to greenhouse gas emissions. Additionally, the use of digital twin models requires continuous data collection and processing, which can also consume a lot of energy.

Therefore, while digital twin technology can be used to improve environmental sustainability in various industries, it's important to consider the potential negative environmental impacts of its development and use. Efforts are being made to make digital twin technology more energy-efficient, such as using renewable energy sources to power data centers and optimizing data processing algorithms to reduce energy consumption.

#12 edge computering

Edge computing is a distributed computing paradigm in which data processing and storage are performed near the edge of the network, closer to where data is generated and consumed, rather than in a centralized location. This approach aims to reduce latency and bandwidth usage by processing data locally rather than sending it back and forth to a centralized data center or cloud.

In edge computing, data is processed in devices called edge nodes or gateways, which are located close to the source of the data, such as sensors or IoT devices. These edge nodes are typically low-power devices with limited computing resources, and they are designed to perform basic processing tasks such as filtering, aggregation, and analysis of data.

Edge computing can have several benefits, including:

- Reduced latency: By processing data locally, edge computing can reduce the time it takes to receive a response to a query or command.
- Improved reliability: Edge computing can provide more reliable service by allowing data to be processed even when the network connection is temporarily lost.
- Reduced bandwidth usage: By processing data locally, edge computing can reduce the amount of data that needs to be sent back and forth between devices and centralized data centers.
- Improved security and privacy: Edge computing can help improve security and privacy by keeping sensitive data closer to the source and limiting the amount of data that needs to be transmitted over the network.

Edge computing is increasingly being used in various industries, including healthcare, manufacturing, and transportation, to enable real-time processing and decision-making at the edge of the network. It is also being used in the context of the Internet of Things (IoT) to enable more efficient and reliable data processing and communication between IoT devices.

Regenerate response

Required Confirmations

This posting is for a Content Creator. Content Creators are responsible for creating/developing content for all or part of a specific course. Can you confirm you are qualified for this role? **Yes**

The engagement starts at 04/01/2023 and ends on 06/30/2023. Can you confirm your availability? **Yes**

The compensation method is hourly and the rate is US$ 90/hour. Do you agree with this compensation? **Yes**

Do you understand the requirements?

Purpose:

MIT Horizon seeks experts in various aspects of environmental sustainability to help support the development of educational content for working professionals. As a publication for technology education, we are specifically interested in the sustainability implications of modern technologies, including:

5G, additive manufacturing, artificial intelligence, augmented & virtual reality, big data analytics, blockchain, cloud computing, digital twin, edge computing, internet of things, robotics, quantum computing.

The ideal candidate will have specific knowledge in one or more (not all) of those technologies and their impact on the environment. What opportunities do these technologies create for climate action, and can they be leveraged for more sustainable practices? How do these technologies, and their development and use, contribute to climate change or other environmental harms? Can those harms be mitigated?
MIT Horizon reaches an educational audience of more than 1 million professionals at F500 companies and government organizations.

Duties:

Work with MIT Horizon editor, writers, and researchers to:

- Draft notes, and provide resources and examples, on the intersections between emerging technologies and climate or sustainable practices;
- Answer questions and provide expertise via phone, email, and if possible in-person meetings;
- Review and fact-check drafts of articles for accuracy and completeness;
- Help connect educators to other knowledgeable, credible experts in sustainability.

Requirements:

- Proven expertise in the study or field of sustainability, especially as it relates to emerging technologies.
- 4 –10 hours a week for three months.
- This is a remote contract position.

Do you confirm the requirements? **Yes**

Qualifications that ap

- Masters degree in relevan
- Good time management s
- General interest in digital

How many online courses have you taught for any higher education institution?

1-5

How many non-online courses have you taught for any higher education institution?

1-5

What inspires you to teach?

My carpenter's toolbelt! I never want another student I work with to wear one to survive No matter a person's experience, I will endeavor to help them grow and connect to thei skill potential.

What personal characteristics and/or experiences from your non-academic backgroun will make you a good online instructor?

Technologies of the new real, the rise of machines, and the future of employment necessitate preparedness. I am skill based person and help others connect to their aptitudes and build resilience.

- 5G, additive manufacturing, artificial intelligence, augmented & virtual reality, big data analytics, blockchain, cloud computing, digital twin, edge computing, internet of things, robotics, quantum computing.
- The ideal candidate will have specific knowledge in one or more (not all) of those technologies and their impact on the environment. What opportunities do these technologies create for climate action, and can they be leveraged for more sustainable practices? How do these technologies, and their development and use, contribute to climate change or other environmental harms? Can those harms be mitigated?

Cover Letter

Hello! thank you for the courtesy of this 2nd invitation to support the MIT Horizon program.
The following evidence supports the ability to contribute significantly and skillfully to the project's demands. Best, Brian Hogan, MS

Summary:
I excel at research, and my inductive reasoning skills connect the dots between technological capabilities and their use outcomes. As a programmer, I adapt at a data level to deliver AI to my students facilitating interactive learning and promoting cross-pollination of skill development.

I love the potentiality of insects and highly recommend this article:
Spatial Monitoring and Insect Behavioural Analysis Using Computer Vision for Precision Pollination
Ratnayake, Malika Nisal; Amarathunga, Don Chathurika; Zaman, Asaduz; Dyer, Adrian G; Dorin, Alan. **International Journal of Computer Vision; New York** Vol. 131, Iss. 3, (Mar 2023): 591-606. DOI:10.1007/s11263-022-01715-4
Insects are the most important global pollinator of crops and play a key role in maintaining the sustainability of natural ecosystems. Insect pollination monitoring and management are therefore essential for improving crop production and food security. Computer vision facilitated pollinator monitoring can intensify data collection over what is feasible using manual approaches. The new data it generates may provide a detailed understanding of insect distributions and facilitate fine-grained analysis sufficient to predict their pollination efficacy and underpin precision pollination. Current computer vision facilitated insect tracking in complex outdoor environments is restricted in spatial coverage and often constrained to a single insect species. This limits its relevance to agriculture. Therefore, in this article we introduce a novel system to facilitate markerless data capture for insect counting, insect motion tracking, behaviour analysis and pollination prediction across large agricultural areas. Our system is comprised of edge computing multi-point video recording, offline automated multi-species insect counting, tracking and behavioural analysis. We implement and test our system on a commercial berry farm to demonstrate its capabilities. Our system successfully tracked four insect varieties, at nine monitoring stations within polytunnels, obtaining an F-score above 0.8 for each variety. The system enabled calculation of key metrics to assess the relative pollination impact of each insect variety. With this technological advancement, detailed, ongoing data collection for precision pollination becomes achievable. This is important to inform growers and apiarists managing crop pollination, as it allows data-driven decisions to be made to improve food production and food security.

==
Specifics on my AI courses built:
1. Research Interest details my PhD target and current AI course in development.

1.1 Use of polysyllabic for authenticity identification.
Before the release of ChatGPT, I've been working on using polysyllabics and logodaedaly to test new authenticity scoring mechanisms. The intention isn't to discern plagiarism but to create a) a discourse score and b) a programmatic means to improve information exchange quality with polysyllabicisms and periphrastics.
>Encourage students to continuously inventory their work for authenticity score substrate, i.e., an individual's unique originality score.
>Inventory diverse polysyllabic words into syllable trees.
>Transpose syllable tree ontological categories with LDA et al.
>Form (n x 3) matrix by ontology by word by its polysyllabic complexity score.
>Validate score mechanism and validate methods for accuracy and effectiveness.
>Integrate ChatGPT's API to facilitate scoring (submitted academic research application on 02.16.23)
>future - build and release library(pypi.org) promote polysyllabic upscaling for computer scientists.

1.2 Teacher, ICARUS AI E-Learning, Santa Monica, CA Dec 2022 –
Course Author
Course: Technical Writing with ChatGPT (new!) Mar 2023
Two of my students used ChatGPT to pass exams last semester, and neither delivered work in their voice. Applying NLP training from linguistic expert Dr. Nancy McCracken, the course instructs on the AI principals of ChatGPT, mechanics, and Python code for originality scoring dashboard (custom metric based on polysyllabic usage).
>Provide discourse metrics numerically representing authentic self.
>>Upscale a user's information exchange quality with epexegesis and forming polysyllabic trees that characterize ontologies of interest.

Course:>_7.Pillars.of.Python Dec 2022 - Feb 2023
>Formulated a novel Python course for learners to experience neuroplasticity with data object transformation by coding iterators, conditionals, and functions with class objects to deliver outcomes.
>>Targets learners who question if their skills effectively provide reliable, know-how activities to successfully transform data for performing statistical analysis and artificial