CCECE 2023 Tutorial on "Generative AI (GenAI) and its impact on Post-Secondary Education"

Introduction: ChatGPT and Generative Artificial Intelligence (GenAI) has taken the world by storm and revolutionized various fields, including computer vision, natural language processing, and creative arts. This tutorial aims to provide participants with a brief understanding of generative AI techniques, their applications, and how it would affect post-secondary education. Whether you are a student, researcher, educator, or professional seeking to explore the fascinating realm of AI creativity, this tutorial will equip you with the knowledge and skills to embark on your generative AI journey.

Contents:

1. Fundamentals of Generative AI (30 mins):
    - Introduction to generative models and their role in AI.
    - Overview of key concepts: Large Language Models (LLMs), Next Sentence Prediction (NSP), Mask Language Modeling (MLM).
    - Introduction to generative models such as Generative Pre-trained Transformers (GPT), ChatGPT, AgentGPT, AutoGPT, and other latest models.
2. Making GenAI work for you (1 hour):
    - Demonstration of how to use GenAI models for productivity and engineering tasks
    - Exercises:
        - Write invitation emails to participate in an event
        - Create application forms for membership to a society
        - Write job application letters
        - Solve Mathematical / Calculus problems
        - Solve Engineering Mechanics problems
        - Write software programs
        - Write project reports / thesis / academic papers
3. Impact on Post-Secondary Education (1 hour):
    - Is this plagiarism? What are our students learning?
    - Generative AI detectors?
        - ZeroGPT
        - GPTZero
        - AI Text Classifiers
    - Should curriculum be modified to include the use of GenAI?
    - Ethical considerations and responsible use of GenAI.

Key Takeaways: By the end of this tutorial, participants will:

- Understand the fundamental concepts of generative AI and its underlying algorithms.
- Learn how to use some of the latest tool in generative AI.
- Understand the capabilities and the limitations of these generative AI tools.
- Understand the impact of GenAI on post-secondary education.
- Develop an awareness of ethical considerations and responsible use of GenAI technologies.

Conclusion: Generative AI has opened up exciting possibilities for machines to create and imagine, augmenting human creativity in various domains. This tutorial aims to demystify the world of GenAI and empower participants to embark on their own creative endeavors. By providing a basic foundation in generative models and hands-on experience, this tutorial will equip participants with the necessary knowledge of GenAI in their respective fields, and what will be required in post-secondary education to address the challenges that come with it. Get ready to explore a whole new way of getting your work done as GenAI ventures into the realm of imagination and creation!

Presenter: Kin-Choong Yow obtained his B.Eng (Elect) with 1st Class Honours from the National University of Singapore in 1993, and his Ph.D. from Cambridge University, UK in 1998. He is currently a Professor with the Faculty of Engineering and Applied Science in the University of Regina. Prior to joining UofR, he was an Associate Professor in the Gwangju Institute of Science and Technology (GIST), Republic of Korea, (2013-2018), Professor at the Shenzhen Institutes of Advanced Technology (SIAT), P.R. China (2012-2013), and Associate Professor at the Nanyang Technological University (NTU), Singapore (1998-2013). His research interest is in Artificial General Intelligence and Smart Environments, with special interest in Computer Vision, Natural Language Processing, Ambient Intelligence and Explainable AI.