



Proposal for ISIE 2021 Tutorial

Title of Tutorial:

Ethics of Artificial Intelligence and Automation in Industrial Applications

Contact Information of Speakers:

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Background of Speakers:

Daswin De Silva

- Artificial Intelligence
- Automation
- Ethics

Damminda Alahakoon

- Artificial Intelligence
- Cognitive Computing
- Ethics

Donna Burnett

- Artificial Intelligence
- Analytics
- Ethics and Governance

Brief description of the tutorial (500 words max):

The exponential growth of artificial intelligence (AI) and automation has led to an increasing presence of industrial applications in human-centric and human-focused digital environments, such as smart cities, smart grids and smart mobility. As technological innovations become ambient and embedded in our everyday life, it is imperative that the design, development and application is lawful, ethical and trustworthy. Distinguishing from the theoretical and applied sciences, ethics was first described by Aristotle as Eudaimonia, the preservation and advancement of human wellbeing as the highest virtue of human society.

Aligning with these principles, industry, academia, and governments across the world have published guidelines for the ethics of AI and automation. These include the high-level expert group on AI appointed by the European Commission, the expert group on AI in Society of the Organization for Economic Cooperation and Development, the IEEE Global Initiative for Ethically Aligned Design, Association of Computing Machinery, Microsoft, Google, Amnesty International and many others.

Despite this prevalence of principles and guidelines, the real-world application and practice of ethics in industrial settings is still vague and unspecified. This tutorial aims to bridge the gap between policy and the practice of ethics of AI and automation in industrial applications, by following a structured approach that begins with an articulation of the established principles and guidelines, followed by the challenges of practical applications in industrial use cases and drawing out a workflow of ethics for such settings.

It is anticipated this tutorial will be beneficial to academics, research students, and industry practitioners alike in developing and advancing their skills and knowledge in ethics for AI and automation. This tutorial is supported by the Technical Committee on Technology Ethics and Society of the IEEE Industrial Electronics Society.

The following topics will be explored;

- Overview and analysis of relevant ethics principles and guidelines
- Practical use cases of ethics in industrial and technology settings
- Workflow of ethics required for AI and automation in industrial settings
- Exercises and discussion on the practice and evaluation of ethics

Biography:

Daswin de Silva is Associate Professor and Deputy Director of the Research Centre for Data Analytics and Cognition (CDAC) at La Trobe University, Australia. Daswin's research interests include AI ethics, autonomous learning, active perception, information fusion, cognitive computing, neuromorphic computing, natural language processing, deep emotions, psycholinguistics, and intelligent cloud platforms. He has applied AI and automation in practical industrial settings of smart cities, energy and transport. He is an Associate Editor of the IEEE Transactions of Industrial Informatics and the IEEE Open Journal of the Industrial Electronics Society. He is the Secretary of the IEEE IES Technical Committee on Technology Ethics and Society and Chair of the IEEE IES Sub-Committee on Big Data and Machine Learning. He is an award-winning lecturer in Artificial Intelligence, Data Analytics and Automation, with significant contributions to curriculum development, pedagogical innovations and industry engagement at La Trobe. He currently supervises eight doctoral candidates working on theoretical, applied and industry focused challenges of AI and automation.

Damminda Alahakoon is Senior Professor and Director of the Centre for Data Analytics and Cognition at La Trobe University, Australia. Damminda has made significant contributions with international impact towards the advancement of Artificial Intelligence through academic research, applied research, research supervision, industry engagement, curriculum development and teaching. He has published over 100 research articles; theoretical research in self-structuring AI, human-centric AI, ethics, cognitive computing, deep learning, optimization, and applied AI research in industrial informatics, smart cities, robotics, intelligent transport, digital health, energy, sport science and education.

Donna Burnett is the Ethics and Governance Lead of the Centre for Data Analytics and Cognition at La Trobe University, Australia. She possesses many years of experience working with academics and industry practitioners on the ethical issues of the application of AI, analytics and automation, specifically trust, transparency, sustainability and privacy. She is a member of the Human Research Ethics Committee at La Trobe University and a lecturer of AI and technology ethics to undergraduate and postgraduate students.

Brief description of the intended audience

The intended audiences include academics, industry practitioners and any other conference participant who is interested to learn about this emerging field of importance. It is expected this tutorial will be useful for new and established researchers to incorporate a sound practice of ethics into their research projects and profiles.

Support technical committee in IES (if any)

IEEE IES Technical Committee on Technology Ethics and Society
Chair: Stamatis Karnouskos, SAP, Germany, karnouskos@ieee.org