The IECON 2022 Organizing Committee invites proposals for Tutorials to be held during the conference in Brussels, Belgium from 17 October till 20 October 2022.

The 17th October is reserved for the tutorial sessions.

Tutorials offer participants from different technical backgrounds the chance to explore innovative trends and learn new techniques from experts in the field. One or more of the following elements are strongly encouraged for the proposal: a) Industry-led or co-hxosted lectures; b) Cross-disciplinary topics; c) Interactive and engaging approach.

Suitable tutorial topics range from emerging research areas to established techniques of practical and industrial relevance. Tutorials in all areas of Industrial Electronics disciplines are welcomed and IECON2022 is particularly interested in tutorial topics related to the conference themes.

**IECON 2022 Tutorial Proposal Form**

**Title of the Proposal:** Ethics of Artificial Intelligence and Automation for Industrial Applications

**-** **Presenter(s):**

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**-** **Brief description:**

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.

**- Duration:** 1.5 hours

- **Outline:**

• 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

- **Motivation and Focus:**

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.

-**Brief CV:**

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.

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.

Achini Adikari is a Research Fellow in AI at the Centre for Data Analytics and Cognition at La Trobe University, Australia. Her research expertise is in human-centric AI, theory and applications. Her recent work in human emotions analysis using self-supervised machine learning has been published in high impact journals and applied across a number of industry projects, such as smart cities, digital health and intelligent transportation. In the IES, Achini has volunteered as a session chair, technical program committee, as well as reviewer for IEEE Transactions on Industrial Informatics.



Damien Trentesaux is full professor at the LAMIH UMR CNRS 8201 research lab of the Université Polytechique Hauts-de-France (France). His areas of interest concern the control and the optimization of discrete event systems (manufacturing, transport, logistics, and services) and their interaction with the human in the context of Industry 4.0. Prof. Trentesaux was involved in the H2020 CSA SCORE Project on the assessment of European Manufacturing Industries in Transportation. He is head of the SurferLab, a joint research lab funded by Bombardier Transport, Prosyst and UPHF dedicated to the application of AI in transportation. He also works with IRT Railenium and SNCF on the autonomous train and is currently involved in the project “droit des robots et autres avatars de l’humain” funded by the IDEX Université de Strasbourg. Prof. Trentesaux has supervised 15 PhD thesis and is author and co-author of more than 180 peer reviewed publications in journals, books, and chapters of books and conference proceedings

- **Relevant publications:**

**De Silva**, D., Sierla, S., Alahakoon, D., Osipov, E., Yu, X. and Vyatkin, V., 2020. Toward Intelligent Industrial Informatics: A Review of Current Developments and Future Directions of Artificial Intelligence in Industrial Applications. IEEE Industrial Electronics Magazine, 14(2), pp.57-72.

**Trentesaux, D.,** and **Karnouskos, S.** (2021). Engineering ethical behaviors in autonomous industrial cyber-physical human systems. Cognition, Technology & Work, 1-14.

**Karnouskos, S.** (2021). Symbiosis with artificial intelligence via the prism of law, robots, and society. Artificial Intelligence and Law, 1-23.

Berrah, L., and **Trentesaux, D.** (2021). Decision-Making in Future Industrial Systems: Is Ethics a New Performance Indicator. Service Oriented, Holonic and Multi-Agent Manufacturing Systems for Industry of the Future, 952, 231.