Digital Transformation towards Industrial 5.0

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This presentation discusses the profound technological changes that have taken place around us during the last two decades, supported by the new disruptive advances both on the software and the hardware sides, as well as the cross-fertilization of concepts and the amalgamation of information, communication, and control technology-driven approaches. In recent years, to change the whole format of industrial automation, these developments have been taken further, especially in Germany, under the label "Industry 4.0". The dominant feature of Industry 4.0 is the integration of the virtual world with the physical world through the Internet of Things (IoT). Such engineered systems are named Cyber Physical Systems built from, and depend upon, the seamless integration of computational algorithms and physical components. A more comprehensive description of what is happening around us is the digital transformation. After reviewing these profound changes, a preview of Industry 5.0 is presented. The presentation then switches to integrating AI in digital transformation in various forms. A brief history of AI and a look into the future are presented, emphasizing Symbiotic Autonomous Systems. The presentation will conclude, pondering whether "Singularity," as was defined 15 years ago, will meet the same fate as the "Thinking Machines.

Short Biography of Okyay Kaynak

Okyay Kaynak received the B.Sc. degree with first-class honors and Ph.D. degrees in electronic and electrical engineering from the University of Birmingham, UK, in 1969 and 1972, respectively.

From 1972 to 1979, he held various positions within the industry. In 1979, he joined the Department of Electrical and Electronics Engineering, Bogazici University, Istanbul, Turkey, where he is currently a Professor Emeritus, holding the UNESCO Chair on Mechatronics. He has held long-term (near to or more than a year) Visiting Professor/Scholar positions at various institutions in Japan, Germany, the U.S., Singapore, and China. His current research interests are in the broad field of intelligent systems. He has authored three books, edited five, and authored or co-authored more than 450 papers that have appeared in various journals and conference proceedings.

Dr. Kaynak has served as the Editor in Chief of IEEE Trans. on Industrial Informatics, IEEE/ASME Trans. on Mechatronics and as the Co-Editor in Chief of IEEE Trans. on Industrial Electronics. He presently serves as the Founding Editor-in-Chief of Springer journal Discover Artificial Intelligence. Additionally, he is on the Editorial or Advisory Boards of several scholarly journals. He has received the Chinese Government's Friendship Award, Humboldt Research Prize, Doctor Honoris Causa, Obuda University, Hungary (2020) and the Academy Prize of the Turkish Academy of Sciences (2020). He is a member of this Academy.