Jose Antonino-Daviu (S'04-M'08-SM'12) was born in Valencia, Spain, in 1976. He received his M.Sc. and Ph. D. degrees in Electrical Engineering, both from the Universitat Politècnica de València, Valencia, Spain in 2000 and 2006, respectively and the Ms. Degree in Business Administration and Management from the Universitat de València, Valencia, Spain, in 2012. He worked for IBM, being involved in several international projects. He is currently Associate Professor in the Department of Electrical Engineering of the Universitat Politècnica de València, where he develops his docent and research work. He is also Secretary of the mentioned Department.

His primary research interests are condition monitoring of electric machines, signal processing and its application to fault diagnosis as well as design and optimization of electrical installations and systems. His main achievement is the development of techniques for the reliable diagnosis of the rotor condition in electric motors; these innovative techniques rely on the analysis of machine's currents during transient operation. He has been invited professor in Helsinki University of Technology (Finland) in 2005 and 2007, Michigan State University (USA) in 2010, Korea University (South Korea) in 2014, Université Claude Bernard Lyon 1 (France) and Coventry University (2016). He has taught seminars in several Universities all over the world, such as AGH University of Science and Technology of Krakow (Poland), Helsinki University of Technology (Finland), Michigan State University (USA), University of Korea (South Korea), Université Claude Bernard Lyon 1 (France),Coventry University (U.K.). Moreover, he has established important collaborations with important companies where his techniques have been applied. He has taught technical courses for international companies as BASF DE (Germany), GENERAL ELECTRIC (Europe), KARSTEN MOHOLT (Norway), REPSOL (Spain)...and given technical talks in many other companies (SABIC (Netherlands), BRITISH PETROLEUM (Spain), UBE CHEMICAL (Spain), FYM ITALCEMENTI (Spain)..).

He is co-author of more than 160 papers published in technical journals (>60 papers) and conference Proceedings (>100). He is also co-author of 1 international patent. These works have received more than 2700 citations to his works. Since 2012, he is IEEE Senior Member. He is Associate Editor of IEEE transactions on Industrial Informatics and Member of the Editorial Board of the aforementioned journal. He has also acted as Guest Editor in IEEE transactions on Industrial Electronics. He has been Special Session organizer as well as session chair in different IEEE conferences (IECON, ICEM, ICELIE, INDIN…) and he acts as reviewer for several IEEE journals as well as for other international publications. He was recipient of the IEEE Second Prize Paper Award of the Electric Machines Committee of the IEEE Industry Applications Society. He was also awarded with the Best Paper Award in the conferences IEEE ICEM 2012 and IEEE SDEMPED 2011 and he was awarded with the 'Highly commended recognition' of the IET Innovation Awards in 2014 and in 2016. He was also recipient of the Extraordinary Award for the best Ph. D. theses (2007) and the Award of 'International Finances-Banco Santander Chair' to the Best record of the Ms. Degree in Business Administration and Management (2012).

He has been general co-chair of IEEE SDEMPED 2013 and is member of the Steering Committee of IEEE SDEMPED. This is one of the most important events in the world in the area of condition monitoring of electric motors. He is also member of the International Committee of any other international Conferences.

In 2016, he was awarded with the 'Medal of the Spanish Royal Academy of Engineering' for his contributions in new techniques for predictive maintenance of electric motors (2016).

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LECTURE TOPICS

1. **Application of advanced signal processing techniques for electric motor fault diagnosis: foundations and case stories**

   Over recent years, the use of advanced signal processing, artificial intelligence and pattern recognition methods has proliferated in the electric motors fault diagnosis area. Tools and techniques that showed good results in other scientific fields have been recently applied to several motor signals (vibrations, currents, fluxes…) and have enabled to obtain very relevant information about the health of different machine components. In this context, the use of sophisticated time-frequency transforms has expanded the applicability of classical techniques to many other operation regimes of the machine. The objective of this lecture is to provide an overview of the different signal processing techniques that are being currently used in the electric motor condition monitoring field, including both classical tools and recently used transforms in the area: wavelet transforms, Hilbert-Huang transforms, Wigner-Ville and Choi-Williams Distributions and their variants…The lecture will detail the bases of each particular technique and will provide real case stories in which the use of these transforms was critical to reach a correct conclusion on the motor condition. The target audience is based on practicing engineers, researchers and even master students, interested in the area of electrical machines fault diagnosis.

2. **Induction motor condition monitoring via current analysis: classical methods (MCSA) vs. modern transient-based technologies (ATCSA)**

   The analysis of motor currents is one of the most widespread techniques in industry for determining the condition of induction motors. The classical method relies on the analysis of steady-state currents of the machine (Motor Current Signature Analysis, MCSA) and has been applied over decades with rather good results. However, over recent years, some authors have reported important drawbacks of MCSA, such as the occasional occurrence of false indications or its unsuitability under variable speed conditions. To overcome them, new methods based on the analysis of transient signals such as the startup current (Advanced Transient Current Signature Analysis, ATCSA) have been introduced. This lecture is intended to explain in detail the different available current-based fault diagnosis approaches, including the classical tools (MCSA) and the recent methodologies (ATCSA). The foundations of MCSA will be detailed, characterizing the different harmonics that should be present both in healthy and faulty conditions. Afterwards, drawbacks of MCSA will be described. Finally, foundations of ATCSA will be accurately explained and its different variants commented. All the explanations will be supported by real cases related to industrial motors of different sizes.