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Hitoshi Kijima

Recent Advances in Intelligent Control, Modelling and Simulation

Proceedings of the 2nd International Conference on Intelligent Control, Modelling and Systems Engineering (ICMS '14)

Cambridge, MA, USA, January 29-31, 2014

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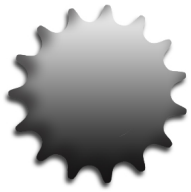

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Plenary Lecture 1

Lightning Surge Response Improvement by Combinations of Varistors and Gas Discharge Tubes

Professor Hitoshi Kijima
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Abstract: This lecture proposes a new methodology for protecting power apparatuses against overvoltage or overcurrent caused by lightning surge. Surge Protective Devices (SPDs) are used for protecting apparatuses against overvoltage or overcurrent caused by lightning surge. SPDs are mainly divided into two categories. One is clamping type and the other is switching type. Typical clamping type SPD is a variable resitor (varistor). Typical switching type SPD is a Gas-filled Discharge Tube (GDT). Both varistors and GDTs have problems when using them alone. Therefore both a GDT and a varistor are normally connected in series or parallel. However these simple connections of them have still problems. This paper proposes a lightning surge response improvement by combinations of both varistors and GDTs in order to solve the problems of them. It is that three or more GDTs are connected in series and two or more varistors are connected in parallel. This new methodology has already beeing filed as patents in many countries such as USA, Australia, China, Korea, Japan and EU. The proposed methodology could solve the problems of conventional combinations of a GDT and a varistor.

Brief Biography of the Speaker: He was born in Yamanashi; Japan in 1952. He received his BS in Electrical engineering from Yamanashi University (1975), his MS in Electrical engineering from Yamanashi University (1977), and his Ph.D. from Tokyo University (1999).. His field is all EMC aspects such as lightning protection, noise reduction, earthing systems. He served 20 years in R&D center of NTT (Nihon Telegraph and Telephone public corporation). He was leader of EMC Department. Then He became professor of Polytechnic University. He published many books such as Recent Lightning Protection (ISBN4-542-30397-7) 2006, Electrical Engineering (ISBN4-87563-022-0) 2003, Earthing & Lightning Protection (ISBN4-88552-147-5) 2002. He obtained the best paper award for the 9th WSEAS International Conference (EHAC '10) University of Cambridge, UK, February 20-22, 2010, Electromagnetic Force Analyzed Results on Switchgear of Disconnector for Overevoltage Protector, pp.135-140 Hitoshi Kijima, Tomooki Hasegawa. Recent papers are as follows. [1] H. Kijima, K. Takato, K. Murakawa, Lightning protection for gas-pipelines installed under the ground, International Journal of systems and applications, engineering & development, Issue 1, vol. 5, pp117-126, 2011? [2] H. Kijima, T. Hasegawa, Electrical force analyzed results on switchgear of disconnector for overvoltage protector, WSEAS Transactions on power systems, Issue 1, vol. 5, pp32-41, 2010 [3] H. Kijima, M. Shibayama, Circuit breaker type disconnector for overvoltage protector, WSEAS Transactions on power systems, Issue 5, vol. 4, pp167-176, 2009 [4] H. Kijima, A Development of Earthing-Resistance-Estimation Instrument International Journal of geology, Issue 4, vol. 4, pp112-116, 2009.

Plenary Lecture 2

An Overview on IQ-2 Processes, Their Present and Future

Dr. Nikolai Kobasko
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&
Intensive Technologies Ltd, Kyiv, Ukraine
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Abstract: IQ-2 process is a new technology which uses achievements of material and thermal sciences. Thermo – regulated thermal process is a main basis for monitoring phase transformation during quenching. It creates high compressive residual stresses on the surface of hardened products and provides super-strengthening of a material that results in increasing service life of machines and constructions. At present time, IQ-2 processes are already used in the practice. In the future, IQ-2 processes can be combined with the cryogenic and thermo – mechanical heat treatment and other advanced technologies which could be significantly extended and improved due to combination and monitoring. Many presentations on this subject were discussed at the WSEAS and NAUN Conferences. This presentation summarizes practical and theoretical data and makes prediction for the IQ-2 technology's future.

Brief Biography of the Speaker: Dr. Kobasko received his Ph.D. from the National Academy of Sciences of Ukraine. He is a leading expert on quenching and heat transfer during the hardening of steels. He was the Head of the laboratory of the Thermal Science Institute of the National Academy of Sciences of Ukraine. He is Director of Technology and Research and Development for IQ Technologies, Inc., Akron, Ohio and supervisor of Intensive Technologies, Ltd, Kyiv, Ukraine. The aim of both companies is material savings, ecological problem-solving, and increasing service life of steel parts. He is an ASM International Fellow (FASM). Dr. Kobasko is the author and coauthor of more than 270 scientific and technical papers, several books and more than 30 patents and certificates. He received the Da Vinci Diamond Award and Certificate in recognition of an outstanding contribution to thermal science. Dr. Nikolai Kobasko was Editor-in-Chief and Co-Editor of the WSEAS Transactions on Heat and Mass Transfer; and is currently a member of the Editorial Board for the International ASTM Journal "Materials Performance and Characterization (MPC).

Plenary Lecture 3

Overview of the Frequency Inverters and Different Techniques to Improve Their Performance

Professor Aldo Pardo Garcia
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Abstract: This lecture presents a review of frequency inverters and different techniques to improve their performance. In order to improve and evaluate the performance of multilevel inverters and conventional inverters (two-level inverters) Bio-Inspired Algorithms and the Total Harmonic Distortion Factor (THD) were used. They have been applied to find the best operational parameters of frequency inverters; the optimal parameters to reduce the total harmonic distortion (THD) at a PWM conventional inverter and selective harmonic elimination (SHE) was used to compute the optimal switching angles at a multilevel inverter.

Brief Biography of the Speaker: Prof. Pardo Garcia Aldo is a full Professor in Electrical and Mechatronic Department, University of Pamplona. He is an Electrical Engineer, graduated in Belarusian State Agrarian Technical University 1983, (MSc 1983, Esp. 1982) and graduated PhD in Belarusian National Technical University 1990.
Postdoctoral research at CINVESTAV Guadalajara, Mexico (2007/2 – 2007/4), Postdoctoral research at Florida International University, USA (2007/9 – 2009/3). Over 25 years of experience of teaching and research in Universities - of Camaguey, (Cuba, 12 years), of Byelorussia (Minsk, Byelorussia, 3 years) and Pamplona, Norte de Santander, Colombia (15 years and currently).
For 7 years was the head of the research in The Institute for Research and Applied Technology Development (IIDTA 2000 - 2007), University of Pamplona, Colombia, dedicated to create innovative products and researches processes for university and Industry. Dean of the Faculty of Engineering (2010 to 2013). Lector plenary in Universities of Mexico, of Venezuela, of Spain, of Byelorussia, of Colombia, of Cuba, of Puerto Rico, of United State of America, of Portugal and of Rumania. The results in the last 5 years: Articles published (54), Projects research (4), Softwares with copyright (5), Books published (5), and Participation as an opponent for Masters (10) and PhD thesis (3).

Plenary Lecture 4

Remote Supervising and Decision Support for On-Line Monitoring Systems in Power Plants

Professor Aleksandar Nikolic
Electrical Engineering Institute Nikola Tesla
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Abstract: Continuous or on-line monitoring systems are a must nowadays in large scale plants like thermal power plants. One of most important parts in thermal power plant are power transformers. Depending on installed power of the plant, there could be at least three or even much more high power transformers. Usually, they are equipped with several monitoring and control systems: thermal management and cooling control system, gases in oil analyzer, partial discharge of insulation analyzer. Proposed monitoring systems uses state-of-art devices connected to the high-speed Ethernet network with control room computer and power plant industrial LAN. In order to improve overall system reliability, it is a merit if these systems are supervised over Internet. In that case high power transformers operating in such a large system like thermal power plant could be analyzed and managed easily from remote location(s). The most important benefits are possibility to perform changes and improvements of measurement and control software in PLC, SCADA software on computer in control room, to check devices status and availability, perform remote maintenance. Additional advantage is decision support, where results taken from on-line monitoring systems are analyzed by external experts that help plant staff and management to make decision about plant operation when some of possible malfunction of transformers is detected or expected.

Brief Biography of the Speaker: Aleksandar Nikolic received the B.Sc., M.Sc. and Ph.D. degrees in electrical engineering in 1991, 1999 and 2009, respectively, from the Faculty of Electrical Engineering, University of Belgrade, Serbia. Since 1995 he has been with University of Belgrade, Serbia, as a Research Associate at the Department of Electrical Drives, where he is currently part-time Assistant Prof. He is now at Electrical Engineering Institute “Nikola Tesla”, Belgrade, Serbia, as a Principal Technical Associate for the field of energy efficiency. He is also founder and a Head of Accredited Laboratory for Power Quality testing at Institute Nikola Tesla.
His special fields of interest include power quality and energy efficiency, control of induction motor drives and industrial automation. He has published about 90 papers and one chapter in international book “Torque Control”. He is reviewer of several international Journals. A.Nikolic is a Senior member of IEEE and a Member of the Board of Serbian Power Electronics Society.

Plenary Lecture 5

Exploratory Analysis of Functional Brain MR Multimodal Imaging Sleep Data

Professor Radu Mutihac
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Abstract: Analysis of event-related biomedical functional time series is a complex task due to temporal dispersion of the hemodynamic response and aliasing of physiological noise. The present contribution addresses the exploratory analysis of EEG-correlated functional MR (fMRI) brain imaging simultaneously acquired data during deep sleep. Fused EEG-fMRI in imaging neuroscience features noninvasively capture of electrophysiological and hemodynamic activity of the intact human brain with optimal spatiotemporal resolution. While exploratory analysis like independent component analysis (ICA) is meant to generate testable hypothesis (models), the goal of confirmatory analysis like general linear modeling (GLM) is to test their statistical significance. A dynamic interplay between hypothesis generation and hypothesis testing maximizes chances of successfully dealing with the increasingly complex experiments resulting in large data sets.
Common sleep loss effects like slowed response times, a narrowing of attention, and an increased propensity to initiate sleep were initially studied with cognitive/psychomotor measures. With the advent of functional MR brain imaging, sleep loss effects have been correlated with brain deactivation, especially in the prefrontal cortex, inferior parietal/superior temporal cortex, thalamus, and anterior cingulate [Thomas et al., 2000], so that the interest has gradually shifted towards higher-order cognitive functions like problem solving and moral reasoning. The precise neurophysiologic mechanisms driving such deactivation, and ultimately the function of sleep itself, remain unclear though. Present challenges in sleep studies consist in delineation of the cognitive abilities affected by specific cognitive tests run during sleep loss.

Brief Biography of the Speaker: Professor Radu Mutihac got his PhD in Physics at the University of Bucharest in 1994 and became full professor in 2000. His main research fields have been signal and particularly image processing, microelectronics, and artificial intelligence. As postdoc/research associate/visiting professor/full professor he run his research and didactic activity at the University of Bucharest, 1981-on, at the International Centre for Theoretical Physics (Trieste, Italy, 1993-2004), EcolePolytechnique (Palaiseau, France, 1993), Institut Henri Poincare (Paris, France, 1998), K.U. Leuven (Belgium, 2000-2001).
In 1993 through 1994, he was appointed Deputy General Director in the Higher Education Department of the Romanian Ministry of Education and Research (MEC) acting as the representative of the MEC in the Organization for Economic Co-operation and Development (OECD).
Data mining and exploratory analysis of biomedical signals were the subjects which he dealt with during two Fulbright Grants in Neuroscience: at the Yale University School of Medicine (New Haven, CT, 1999-2000) and at the University of New Mexico (Albuquerque, NM, 2010-2011). Most of his significant research in fused biomedical imaging modalities was carried out at the Johns Hopkins University and Kennedy Krieger Institute, F.M. Kirby Research Center for Functional Brain Imaging (Baltimore, MD, 2003-2005), National Institutes of Health (Bethesda, MD, 2011-on), and Walter Reed Army Institute of Research (Silver Spring, MD, 2011-3013).
Professor Radu Mutihac is member of the ISMRM, ESMRMB, OHBM, Romanian US Alumni Association, and fellow of Signal Processing and Neural Networks Society IEEE, as well as referee for several journals of the Institute of Physics (London, UK), Neural Networks (Elsevier), IEEE Transactions on Image Processing, and evaluator/expert for the ISMRM, OHBM, CORDIS, ARACIS, CNCSIS, UEFISCDI, and the Romanian – U.S. Fulbright Commission.

Plenary Lecture 6

Intelligent Optimization Algorithms and Their Applications

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Abstract: The traditional optimization technology can be used to solve the simple, continuity, and small-scale problems, and they also have been successfully applied in many areas, such as system control, pattern recognition, and production scheduling. However, they are based on mathematics, and try to pursuit the theoretical accuracy and perfection. As for the traditional optimization technology, their optimization framework not only brings themselves some calculation disadvantages, but also limits their applications. With the development of computer technology, a series of modern intelligent optimization methods, such as genetic algorithm, ant colony algorithm and quantum evolutionary algorithm, have attracted lots of scholars' attention. These modern intelligent optimization algorithms are inspired by the natural rules or biological mechanisms. Compared with the traditional optimization technology, they can solve discrete, uncertainty, large-scale problems and have better performance when they are applied to solve complicated engineering optimization problems. In this topic, we will present a methodology for intelligent optimization algorithms design, constructing and their corresponding performance evaluation for the practical applications.

Brief Biography of the Speaker: Changpeng Ji is currently Professor at the School of Electronics and Information Engineering, Liaoning Technical University; currently He is senior member of WASE and IACSIT, Editor in Chief for Int. J. of Convergence Computing and EB members for Int. J. of Embedded Systems and J. of computers. His main research interests include Artificial Intelligence Computing, Information Science and Technology, Computer communication, Signal processing, and so on. He has published more than 100 articles in edited volumes & academic journals and has also owned a number of patents in his research fields. He has organized a number of international conferences mainly in the field of computer science and computer communication. He has given public and academic lecturers, and received prizes for academic excellence from various academic institutions and foundations.