

# PREFACE

This volume contains the proceeding of the 5th International Congress on Technical Diagnostics organized jointly with the 3rd International Conference on Smart Diagnostics 2012. The first Smart Diagnostics Conference was organized in Krakow in 2010 and had 65 participants from 9 countries. The 2nd Smart Diagnostics Conference was organized in the same place in 2011 and had 157 participants from 20 countries. The 5<sup>th</sup> International Congress of Technical Diagnostics had 120 participants from 7 countries.

The aim of the conference is to bring together the expertise of scientist and engineers from universities and industry in the field of Structural Health Monitoring, Non-Destructive Evaluation, and Condition Monitoring. Networking of diagnostic systems designers and system users is crucial for successful operation of many SHM systems and is the main task of the meeting. The study of damage detection, localization and assessment are important in rapidly growing area of SHM. Due to interdisciplinary character of SHM systems, the conference brings together experts from area of mechanics, materials engineering, electronics, software engineering, and signal processing as well as system users from civil engineering, aviation, power plants, wind turbines, chemical plants, petrochemical plants and railways sectors. A significant part of the conference is dedicated to utilization of advanced measurement techniques, signal processing, and computation methods. The Smart Diagnostics conference is established as a international forum for discussion and dissemination of recent advances in damage detection, localization, assessment, and safe life prognosis of many different structures.

The proceedings covers activities relevant to analytical solution, numerical simulation, experimental validation of SHM techniques as well as case studies. The conference themes are as follows:

- General theory on technical diagnostics
- Sensor and measurement systems in diagnostics
- Structural Health Monitoring (SHM)
- Analytical and numerical models of technical facilities and their application in diagnostics
- Signal processing theory and applications
- Algorithms, methods and diagnostic tools
- Rotating machinery diagnostics
- Condition Based Maintenance (CBM)
- Methods of detection, location and assessment of failures
- Artificial intelligence in diagnostics
- Diagnostics of industrial systems
- Diagnostics of mechatronic system
- Machineries and industrial systems health management
- Economic aspects of technical diagnostics

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