

# IEEE Prognostics & System Health Management Conference 2010 (PHM-2010 Macau)

12-14 January 2010, University of Macau, Macau, P.R. China

The IEEE PHM-2010 Macau Conference will be held on 12-14 January 2010 at University of Macau. The aim of this conference is to promote the realization and application of PHM as a key enabler for growth for a broad range of industries in the Asia Pacific region. The IEEE PHM-2010 Macau Conference is bringing together the global community of PHM experts from industry, academia, and government in diverse application areas such as avionics and aerospace, marine systems, ground vehicles, power and electronic systems, process industries, computers and telecommunications, material systems, industrial automation, healthcare and medical technology, and many more.

The IEEE PHM-2010 Macau Conference has so far received well over 100 papers from institutions and companies around the world and we are expecting more to come. If you are interested in exchanging your work with other PHM leaders of the world, this is the last chance of paper submission.

## Paper Submission Deadline: 15 November 2009

### PHM Tutorials (14:00 – 17:00, 12 January 2010)

Tutorial 1: PHM for Wireless Health Monitoring Networks

Tutorial 2 : PHM Application for Aviation Industry

Tutorial 3 : PHM technology Development towards Data Fusion and Infotronics



### Selected Presentation Highlights

- Bayesian Hierarchical Mixtures of Experts and Its Application to Aircraft Engine Fault Detection and Diagnosis, **GE Global Research, USA**
- Air Vehicle Reliability for Metallic Structures, **US Navy, USA**
- Description of the TRIADE Programme of the European Framework 7: New Technology Building Blocks for Data Acquisition and Processing, **EADS Innovation Works, France**
- A Neuro-Fuzzy Self Built System for Prognostics: A Way to Ensure Good Prediction Accuracy by Balancing Complexity and Generalization, **FEMTO-ST Institute, France**
- Solution and Reliability Design Support of Complex Influence of Design Factor on Electronic Device, **Yokohama National University, Japan**
- Methodologies for Uncertainty Representation and Management in Prognostics, **Impact Technologies, LLC, USA**
- Using COX Proportional Hazard Model for Multivariate Prognostic Analysis of Bearings, **University of Illinois, USA**
- Guiding principles and trends for Prognostics and Health (Quality) Management, **University of Washington, USA**
- A Stochastic Filtering Based Data Driven Approach for Residual Life Prediction and Condition Based Maintenance Decision Making Support, **University of Salford, UK**
- Fusion Approach for Predictive Maintenance of Heritage Structures, **University of Greenwich, UK**
- Extending Advanced Failure Effects Analysis to Support Prognostics and Health Management, **PHM Technology Pty Ltd, Australia**
- A Simple HUMS Approach to Detect Characteristic Variation for Mechanical System, **Defence Science and Technology Organisation, Australia**
- Machine Health Prognostics Based on Cox-Proportional Hazard Model and Support Vector Machine, **Pukyong National University, Korea**

For more details: <http://www.cityu.edu.hk/phmc>





# IEEE Prognostics & System Health Management Conference 2010 (PHM-2010 Macau) - PHM Tutorials -

University of Macau, Macau, China  
12 January 2010, 14:00-17:00

## TUTORIAL 1: PHM FOR WIRELESS HEALTH MONITORING NETWORKS

Wireless devices are gaining in popularity as a method for monitoring the health of the human body. Technical advances in small bio-sensors that are worn on patients' bodies and that utilize wireless body area networks can capture data more accurately and can be manufactured more economically. These devices can enable general health assessment of patients, help patients to maintain fitness, aid in rehabilitation, and warn of potentially harmful conditions.

Bio-sensor devices must be supported by reliable wireless communication systems that capture sensor data and relay it for subsequent analysis and storage. Prognostics and health management (PHM) of electronics can play a crucial role in ensuring the reliability of these wireless health monitoring networks.

This tutorial will provide attendees with knowledge of how PHM techniques can be applied to wireless health monitoring networks. The tutorial will cover the factors that affect the reliability of these networks and demonstrate how PHM can successfully address these concerns.

## TUTORIAL 2: PHM APPLICATION FOR AVIATION INDUSTRY

Safety and economy are critical objectives for aircraft manufactures and airlines. As to the aircraft, structure, airborne equipments and aero-engine are of paramount importance. Aviation industry will face difficult challenges as it seeks to maintain the highest standards of safety, whilst maximizing profit.

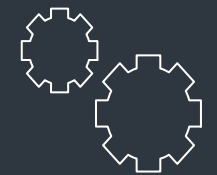
PHM implementation can help the aviation industry to significantly improve safety standard. Relevant PHM technologies and techniques will be presented in this tutorial. In particular, advanced monitoring technologies, diagnostic tools for PHM objectives will be presented and specific illustrations of PHM applications related to aero-engine will be described.

## TUTORIAL 3: PHM TECHNOLOGY DEVELOPMENT TOWARDS DATA FUSION AND INFOTRONICS

PHM/CBM technology has been receiving extensive interests. This tutorial will present the concepts and methods associated with data-driven PHM. Attendees will learn about basic techniques steps and popular tools.

Future PHM developing trend will also be introduced, particularly on the implementation of data fusion techniques. Fusing large amount of mutual information at feature or decision levels can bring about enhanced PHM performances. Attendees will learn about typical data fusion solution and efficient fusion algorithms. Methodology on designing data fusion based health monitoring, diagnostics and prognostics will be introduced, with practical engineering cases. The other character is focusing on infotronics techniques that implement internet, wireless communication, embedded sensors, and intelligent technology. The development of infotronics integrated PHM technology platform is becoming major research direction. Some typical research programs will be introduced.

Website: <http://www.cityu.edu.hk/phmc>



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