PHMAP23 Organised session Proposal form

Proposals are invited for organised sessions at PHM Asia-Pacific 2023. These sessions are an excellent opportunity to present a group of similarly focused presentations on any relevant topic that would be of interest to PHMAP23 participants.

- Organised sessions may take the form of a symposium, in which there is a set of presentations (4 presentations per block) centred on a specific topic.
- Each session will be scheduled for an 80-minute block or connected two or more blocks.

Submittal Instructions

- Deadline for Special Session Proposal: 31st January 2023
  - Please complete the information below on the session organiser, title, theme and objective, and the list of presenters (4 presenters per block) is required for a proposal of organised session.
  - Submitted proposals are reviewed by the PHMAP23 technical program committee.
  - Due to the limitation of the session block, please understand that not all proposals may be accepted.
  - For proposals of special sessions that are accepted, the organizers are responsible for the moderation of the session at PHMAP23.
  - Procedure, regulations and important dates for extended abstracts and full papers are the same as those of regular sessions.
  - Please submit this form to the secretariat e-mail: secretariat@phmap.jp

Session organiser: Dr Samir KHAN and Professor Takehisa YAIRI

Session title: Advances in System Health Management Advances for Aerial Vehicles

Field: Aerospace Engineering

Theme and objective:

The advent of system health monitoring methods is realised to preserve system functionality within harsh operational environments. For unmanned vehicles, achieving near-zero downtime whilst integrating more sophisticated health management systems stretches these challenges that affect the cost, design periods, availability of experts, etc. No matter how well a maintenance system is designed, there are always deficiencies due to decisions and trade-offs which present an inherent weakness in systems which only become evident once it is in operation.

These challenges extend the need for system-level health management to help coordinate safety path planning and navigation, control and communication and maintenance scheduling strategies. A real-time health management solution indicates a continuous stream of operational and labelled data that must satisfy several resources and latency requirements. Traditional solutions to the problem rely heavily on well-defined features and prior supervised knowledge, whereas most techniques refer to hand-crafted rules derived from known conditions. While successful in controlled situations, these rules assume that good data is available for them to model processes; indicating that these rules will fail to generalise beyond known scenarios.

To investigate these issues in the UAV domain, state-of-the-art methods need to address the challenges:

- On the use of machine learning for health management
- To detect unknown instances in a multivariate time series
- On out-of-the-box approaches that do not require expert knowledge for configuration
- To address dimensionality and correlation challenges found in most health management systems.

Tentative list of presenters (4 presenters per block):

-Professor Nadjim Horri

-Professor Vaios Lappas

-Dr Samir Khan

-Dr Liew ChunFui