V International Summer School on Fault Diagnosis of Complex Systems

Madrid, 1st – 5th of July, 2013

Promoted by:

Spanish Thematic Network on Supervision and Diagnosis of Complex Systems

Supported by:

GOBIERNO DE ESPAÑA · MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD · SECRETARÍA DE ESTADO DE INVESTIGACIÓN, DESARROLLO E INNOVACIÓN

Asociación Española para la Inteligencia Artificial (AEPIA)

Presentation

The International Summer School on Fault Diagnosis of Complex Systems is a biennial event promoted by the Spanish Network on Supervision and Diagnosis of Complex Systems (http://www.lsi.us.es/~rdiag/index.php/RedSuperv/HomePage) that aims to promote the research on this challenging field and provoke the interaction among research groups and practitioners in Spain and abroad. The school is organized as an intensive one-week course.

Expected attendants are PhD and master students interested in fault detection and diagnosis topics and practitioners involved in monitoring and supervision projects.

The fifth edition of this successful and already established event will take place between the 1st and 5th of July at the School of Telecommunication Engineering of Technical University of Madrid (http://www.etsit.upm.es).

ETSIT UPM · POLITÉCNICA "Ingeniamos el futuro" · CAMPUS DE EXCELENCIA INTERNACIONAL

Organization

Organizing committee:

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Special Guests

Andrés Marcos (Deimos Space, Spain)
Marcin Witczak (University of Zielona Góra, Poland)
Louise Travé-Massuyès (LAAS-CNRS, France)

Academic Staff:

C. Alonso (U. Valladolid), J. Armengol (U. Girona), A. Bregón (U. Valladolid), A. Castillo (UPM), J. Colomer (U. Girona), Mª J. de la Fuente (U. Valladolid), E. García (UPV), R. M. Gasca (U. Sevilla), J. Meléndez (U. Girona), V. Puig (UPC), B. Pulido (U. Valladolid), C. del Valle (U. Sevilla)

Preliminary Program

T1. INTRODUCTION. FUNDAMENTAL CONCEPTS
T1.1 Definitions: fault, failure, detection, diagnosis, reliability...
T1.2 Foundations for fault detection and diagnosis in FDI and DX: detectability, observability, diagnosability...

T2. MODEL-BASED DIAGNOSIS: THE FDI APPROACH
T2.1. Structural analysis and analytical redundancy.
T2.2. Model-based detection methods: parameter estimation, parity equations, state observers for linear and non-linear models.
T2.3. Fault detection: residual evaluation by consistency tests, and envelope generators.
T2.4. Fault isolation: structured and directional residuals.
T2.5. FDI for stochastic dynamic systems: Schemes for a Class of Continuous-Time Stochastic Dynamical Systems. Detectability and Isolability Conditions.

T3. FDI based on statistical models.
T3.1. Fault diagnosis using statistical methods.

T4. MODEL-BASED DIAGNOSIS: THE DX APPROACH
T4.1 Model-based diagnosis from AI Community. Consistency-based diagnosis, CBD: Theoretical (Reiter's) approach.
T4.2 GDE: the computational approach to CBD.
T4.3 Constraint-driven fault diagnosis.

T5. MODELLING AND ESTIMATION STRATEGIES FOR FAULT DIAGNOSIS OF NON-LINEAR SYSTEMS.
T5.1. Introduction to non-nonlinear observer-based fault diagnosis extension towards robustness
T5.2.Introduction to neural networks and their application to fault diagnosis
T5.3. Evolutionary algorithms and their application to fault diagnosis
T5.4. Parameter estimation-based FDI: A case study

T6. PROGNOSIS FUNDAMENTALS
T6.1. Prognosis concepts. Relation to Diagnosis.
T6.2. Model-based Prognosis methods.
T6.3. Aerospatial applications.

T7. BRIDGE: INTEGRATION OF FDI AND DX APPROACHES
T7.1 Theoretical links and comparison.
T7.2 Practical comparison and potential synergies.

Tentative Schedule & Index

Time	Monday	Tuesday	Wednesday	Thursday	Friday
09.00-10.00	Opening + T0. Invited Conference	T2. FDI Approach	T4. AI-DX approach	T5. FDI Modelling/Est for non-linear systems	T5. FDI Modelling/Est for non-linear systems
10.00-11.00					
11.30-12.30	T1.MBD Fundamentals	T2. FDI Approach	T4. AI-DX approach	T6. Prognosis	T7. BRIDGE
12.30-13.30					
13.30-15.30	Lunch	Lunch	Lunch	Lunch	Lunch
15.30-16.30	T2. FDI Approach	T3. FDI based on statistical models	T4. AI-DX approach	Introduction to Diagnosis Competition, DX-C	T7. BRIDGE
16.30-17.30					
17.30-18.30			Demo	Demo	

Organized by:

Collaborators:

Information

Dates
School: 1st - 5th of July, 2013 **REGISTRATION DEADLINE:** 23rd June 2013

Venue
This edition of the School will take place at the School of Telecommunication Engineering (ETSIT), Technical University of Madrid (UPM), (Building A, Room: A-306) in Madrid (Spain). ETSIT – UPM is located at:
Moncloa Campus of International Excellence
Avenida Complutense s/n, Ciudad Universitaria, 28040 Madrid

Accommodation
The event organizers have agreed a special price to accommodate participants at Colegio Mayor Universitario Fundación SEPI in a single room (breakfast included), from Sunday 30th of June to Saturday 6th of July (6 nights): 216 € (36 € / night).
Contact information for accommodation at Colegio Mayor Fundación SEPI:
Address: Avda. Gregorio del Amo, Nº 2, 28040 Madrid
Concierge: (+34) 91 533 86 02 - 03
Secretariat: (+34) 91 533 68 12
Administration: (+34) 91 533 10 30
E-mail: colegiomayor@fundacionsepi.es
Web: http://www.colegiomayor.fundacionsepi.es

A: Colegio Mayor Fundación SEPI
B: ETSIT - UPM

Registration
Available at: https://formacion.funge.uva.es/cursos/summer-school-on-fault-diagnosis/
- Registration before June 1st : 185 €
- Late registration: 300 €

Registration fees include attendance of the course, lunch (not dinner) from Monday to Friday and coffee-breaks
There is one scholarship available for AEPIA students (covering registration fee only).

Additional information and links:
School info: http://www.lsi.us.es/~rdiag/index.php/Escuela2013uk/HomePage
Madrid City Hall: http://www.madrid.es
Madrid tourist information: http://www.esmadrid.com/en/portal.do
How to get to ETSIT: http://www.etsit.upm.es/la-escuela/como-llegar.html