Smart Management for Sustainable Human Environment

Marie Curie ITN

SmartEN ITN Project

The main aim of SmartEN ITN is to create a translational training network, aiming at implementing a multidisciplinary research and training programme in the field of smart management for sustainable human environment. The training programme will focus its activities on research and training in the disciplines of Wireless Sensor Networks, Sensor Signal Processing, Non-Destructive Evaluation and Smart Proactive Management. In order to facilitate integration between the various disciplines, four areas of multi-disciplinary research programmes have been defined. These include Smart Proactive Management of: Structural systems; Heritage and infrastructure; Transportation infrastructure systems and Urban microclimate.

Working Package 1 (WP1): Wireless Sensor Networks

The Marie Curie Fellow will work on Work Package (WP) 1 of the SmartEN ITN which focuses on research and training in the area of wireless sensor node and network design, implementation and deployment. Intersectoral research will be deployed in gaining a better understanding of the challenges involved with the non destructive evaluation and smart proactive management applications, and lead to an effective design and evaluation of the basic building blocks of the system, wireless sensor nodes. Four main research themes are considered within this WP: (a) Communication protocols, (b) Distributed OS for Reconfigurable Sensor Networks, (c) Energy Harvesting and Conservation, and (d) Localization.

Working Package 2 (WP2): Sensor Signal Processing

The Marie Curie Fellow will have the opportunity to work on Work Package (WP) 2 of the SmartEN ITN which will focus on research and training in the area of signal processing and energy efficient wake-up strategies for event based monitoring with wireless sensor networks. Three main research themes are considered within this WP: (a) Distributed processing and Aggregation, (b) Signal Processing for Event Classification, and (c) Middleware. Signal processing in such constrained nodes is not trivial, therefore interdisciplinary research will be conducted between Sensor Signal Processing and Wireless Sensor Networks, Non-Destructive Evaluation and Smart Proactive Management.

Working Package 3 (WP3): Non Destructive Evaluation

The Marie Curie Fellow will have the opportunity to work on Work Package (WP) 3 of the SmartEN ITN which will focus on research and training in the area of Non Destructive Evaluation (NDE) to develop a strong intersectoral skills base. Five research themes are considered within this WP: (a) Optimum Sensor Locations and Requirements for NDE, (b) Combined Monitoring and Inspection Systems, (c) Assessment and Long Term Performance Modelling, (d) Performance Model Updating Based on Sensor Information, and (e) Damage identification. Strong interaction between the five research themes in this Non Destructive Evaluation Work Package is required as well as the Wireless Sensor Networks, Sensor Signal Processing, and Smart Proactive Management Work Packages to achieve integration between these specialisations within a smart proactive management framework.

Working Package 4 (WP4): Smart Proactive Management

The Marie Curie Fellow will have the opportunity to work on Work Package (WP) 4 of the SmartEN ITN focussing on research and training on Smart Proactive Management which will provide the overall framework for linking Wireless Sensor Networks, Sensor Signal Processing, Non- Destructive Evaluation and Smart Proactive Management, as well as providing a vital link with the industrial end users community. Three main research themes are considered within this WP: (a) Proactive Management Strategies, (b) Life Cycle Design and Assessment, and (c) Multi-objective Optimisation. This WP comprises a key element of the whole ITN programme which holds the potential to make a significant contribution in the area of smart proactive management of the human environment.