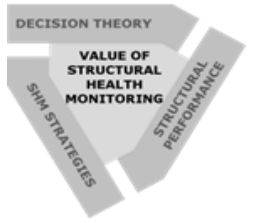




Final TU1402 Workshop Opening

Sebastian Thöns

Department of Civil Engineering, Technical University of Denmark, Denmark

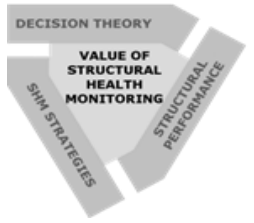


Initiation of COST Action TU1402

SHM constitutes scientifically, technologically and methodologically a well developed field. The potentials of structural health monitoring (SHM) are currently not completely utilised.

Developing SHM to maximize the Value of Information reveals high industrial potentials. Quantifying the Value of SHM is scientifically challenging.

With the initiation of the COST Action TU1402 we are providing a project vision with potentials beyond science and engineering. We are experiencing a large interest.



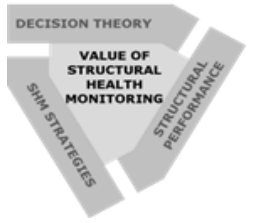
What is COST?

COST (European Cooperation in Science and Technology) is European framework supporting trans-national cooperation and dissemination among researchers, engineers and scholars across Europe.

COST aims to

- Enable breakthrough scientific developments leading to new concepts and products
- Build capacity by connecting high-quality scientific communities in Europe and worldwide
- Provide networking opportunities for Early Stage Researchers
- Increase the research impact on policy makers, regulatory bodies and national decision makers as well as on the private sector

Source: cost.eu



COST Action TU1402: Aims and Objectives

The main objective of the Action is to facilitate sustainable societal developments through improvements of resource efficiency, productivity, robustness, reliability and safety in the design and assets management for structures and infrastructure systems by optimised Structural Health Monitoring (SHM) systems.

Provision and dissemination of a framework with new consistent and efficient approaches to quantify, assess and optimize the benefit of SHM for structures and infrastructures

An improved economic efficiency in operation, maintenance and asset management of structures and infrastructures in the increasingly complex and ageing built environment in Europe



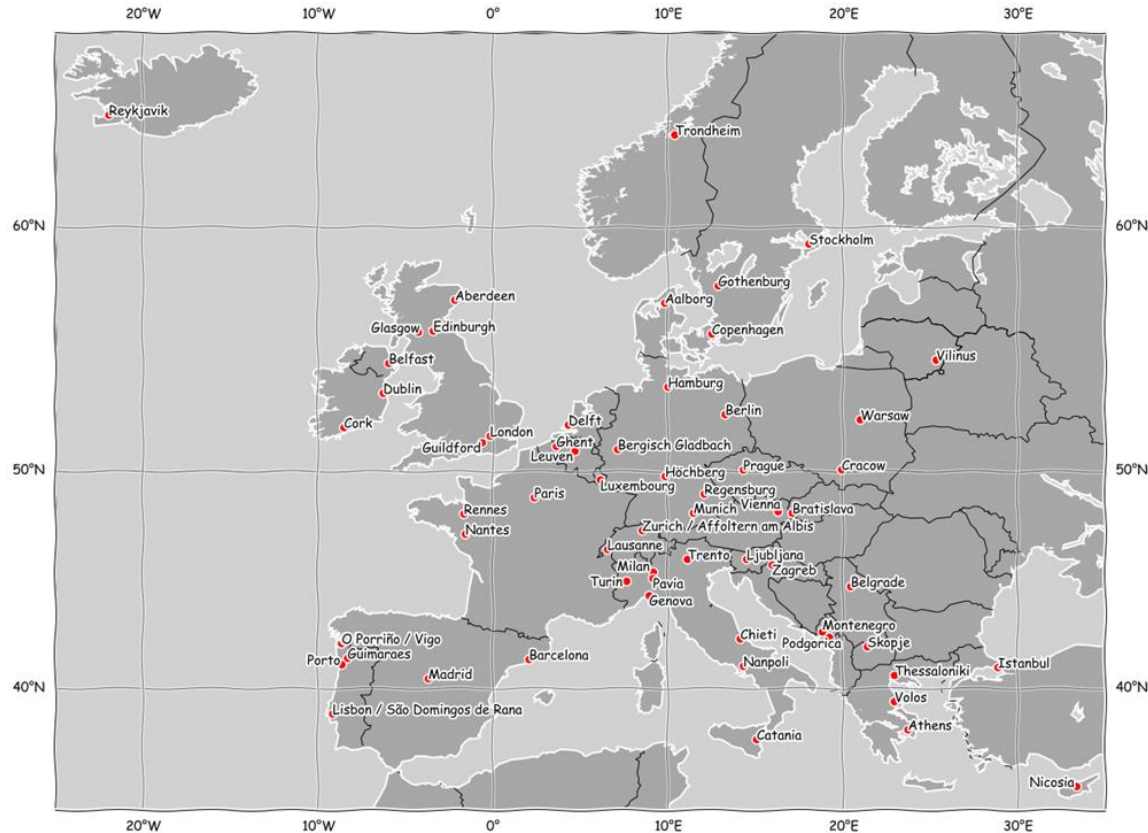
COST Action TU1402

TU1402 (www.cost-tu1402.eu) strives to enhance the benefit of Structural Health Monitoring (SHM) by novel utilization of applied decision analysis on how to assess the value of SHM - even before it is implemented.

- European Cooperation in Science and Technology (COST) as a part of Horizon2020
- Project period: 13.11.2014 - 30.04.2019



COST Action TU1402: Network



The TU1402 network comprises:

- Researchers,
- Engineering consultants,
- Representatives from industrial enterprises
- Representatives from infrastructures operators and authorities

Overall there are about 130 participants from 29 European countries.



COST Action TU1402: Network



The international network comprises e.g.:

- Prof. Mark Stewart, University of Newcastle, Australia
- Prof. Dagang Lu, Harbin Institute of Technology, China
- Prof. Michael D. Todd, University of California San Diego, USA



COST Action TU1402: Activities

- Special Sessions
 - 2019: IABSE (Guimarães, Portugal), ICASP (Seoul, South Korea)
 - 2018: IABMAS (Melbourne, Australia), IABSE (Nantes, France), EWSHM (Manchester, UK), IALCCE (Ghent, Belgium)
 - 2017: IWSHM (Stanford, USA), ICROSSAR (Vienna, Austria)
 - 2016: MSSCE (Copenhagen, Denmark), EWSHM (Bilbao, Spain)
 - 2015: ICASP12 (Vancouver, Canada)
- 60+ conference and journal publications; 5+ workshop reports

- 14 Workshops
- 2 Training Schools
- 15 Scientific Missions

All activities are documented on www.cost-tu1402.eu.




COST Action TU1402: Key deliverables

1. Dedicated dissemination activities.
 - E.g.: workshops, special sessions at international conferences, training courses, scientific missions
2. A well-developed homepage.
 - Activity documentation with videos, presentations and reports
3. A library of tools and algorithms.
4. Guideline on the quantification of the value and optimization of SHM for scientist.
 - Approaches, methods and a principal example
5. Guideline on the quantification of the value and optimization of SHM for consultants and engineers.
 - Detailed examples



COST Action TU1402: Scientific Program


Tasks		Year																		
		1		2		3		4		5										
		Quarter		Quarter		Quarter		Quarter												
		I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II					
Task 1: Theoretical Framework																				
a	Clarification of the theory																			
b	Formulation of the theory for applications																			
c	Communication of the theory																			
M1	Dissemination																			
Task 2: SHM Strategies and Structural Performance																				
a	SHM and structural performance categorisation																			
b	SHM information modelling platform																			
M2	Dissemination																			
Task 3: Methods and Tools																				
a	Databases and modelling toolboxes for engineers and researchers																			
b	Advancement of algorithms for efficient computation																			
M3	Dissemination																			

We are here 



COST Action TU1402: Scientific Program

Tasks		Year															
		1		2		3		4		5							
		Quarter		Quarter		Quarter		Quarter									
		I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II		
Task 4: Case Studies Portfolio																	
a	Selection of case studies																
b	Case study calculation and documentation																
M4	Dissemination																
Task 5: Development of Guidelines																	
a	Chapter of JCSS Probabilistic Model Code (PMC)																
b	Guideline on the quantification of the value and optimization of SHM																
M5	Dissemination of guidelines																

We are here 



COST Action TU1402: Potential achievements

1. We have provided the scientific evidence for the “tremendous economic and life-safety benefits”^{*)} of SHM.
2. We have built up the scientific field of Value of SHM analyses.
 - Provision and extension of a framework ... for the quantification of the Value of SHM
 - Provision and development of models, methods and tools ... for the quantification of the Value of SHM.
 - Development of case studies ... for the quantification of the Value of SHM.

^{*)} Sohn, H., C. R. Farrar, F. M. Hemez, D. D. Shunk, D. W. Stinemates, B. R. Nadler, and J. J. Czarnecki, 'A Review of Structural Health Monitoring Literature: 1996–2001', (2004).



COST Action TU1402: Concept for finalisation

1. Finalisation, publication and dissemination of two guidelines
2. Project and dissemination workshops (Innovation Committee)
3. Final Conference
4. Wrapping up of the Working Group activities and websites for each of the Working Groups
5. Improvement of accessibility of methods and tools (library)
6. ...
- ...

^{*)} Sohn, H., C. R. Farrar, F. M. Hemez, D. D. Shunk, D. W. Stinemates, B. R. Nadler, and J. J. Czarnecki, 'A Review of Structural Health Monitoring Literature: 1996–2001', (2004).



COST Action TU1402: Lessons learnt

1. We work along decision scenarios.
2. We need educational activities.
3. We have established decision analyses in science. We need to establish decision analyses in standardisation, industry and consulting.

Personally: This is and has been a huge learning and working challenge.

^{*)} Sohn, H., C. R. Farrar, F. M. Hemez, D. D. Shunk, D. W. Stinemates, B. R. Nadler, and J. J. Czarnecki, 'A Review of Structural Health Monitoring Literature: 1996–2001', (2004).



Final TU1402 Workshop

The aim of the Final TU1402 Workshop is the progress of the TU1402 deliverables towards completion.

The Final TU1402 Workshop further aims at the

- (1) Preparation of the Final TU1402 Report and Final TU1402 Conference,
- (2) Progress towards finalisation of the case studies,
- (3) Continuation of the standardisation and innovation committee work and
- (4) Organisation of activities beyond TU1402.



Final TU1402 Workshop

08:30-08:45	Welcome by Toula Onoufriou
08:45-09:15	Workshop Opening
09:15-10:30	WG 1: Theoretical Framework Chairs: Michael Faber, Dimitri Val
Coffee Break	
11:00-12:00	WG 2: SHM Strategies and Structural Performance Chairs: Geert Lombeart, Michael Döhler
Lunch Break	
13:00-14:00	WG 3: Methods and Tools Chairs: Daniel Straub, Eleni Chatzi
14:00-15:00	WG 4: Case Study Portfolio Chairs: Jochen Köhler, Helmut Wenzel
Coffee Break	
15:30-16:30	WG 5: Standardisation Chairs: John D. Sørensen, Dimitris Diamantidis
16:30-17:30	WG 6: Dissemination Chair: Maria Pina Limongelli
19:30	Workshop Dinner

Final TU1402 Workshop



09:00-10:00	Innovation Committee Chair: Helder Sousa
	Coffee Break
10:30-12:30	WG internal work and planning
	Lunch Break
13:30-14:30	Discussion on TU1402 outreach activities
14:30-15:00	Concluding discussion



Thank you for your attention.

Let us have a good workshop.