July 2014

SMARTBUILT

Newsletter#6

S.M.ART. BUIL.T 2014

The project is coming to its (successful) end

We now in June 2014 and the Structural Monitoring of ARTistic and historical BUILding Testimonies project (or SMART BUILT in short) is now coming to its end.

As it is probably known, during the last years, the European Community has developed a strong awareness of the role played by historical buildings, not only as objects to preserve, but more importantly as discrete national and regional cultural resources. These buildings represent a key element of the history and the identity of local communities, and of course they additionally contribute to local development both in terms of touristic and economic growth.

Under this perspective, the impact of the studies on structural monitoring and seismic risk prevention is not limited solely to the improvement of building preservation and protection but also to the local economic growth.

Italy and Greece has both a cultural heritage placed in the oldest hearth of their cities. Most of the historic city centers have a high grade of vulnerability to dynamic loads, such as earthquakes, which may induce an unpredictable collapse of a portion of the building or drive the whole structure to a rapid failure.

The two towns considered in the SMART BUILT project - Corfu and Trani - are located in areas with a medium level of seismic hazard and are indeed characterized by a high population density. From this point of view, the two historical centres are characterized by the presence of many ancient and brittle masonry buildings, with a widespread use of local stone.

The SMART BUILT project aimed at providing to technical officials of the municipalities of Trani and Corfu and the “Regional Direction for the Cultural and Landscape Heritage of Puglia” some indispensable training tools for the development and/or validation of structural restoration projects and seismic rehabilitation of historical buildings.

The particular role of the Informatics Department of Ionian University was to design and deploy a wireless sensor network to be used for evaluating ambient-induced vibrations of the historical buildings under consideration.

As you probably know, traditional wired monitoring technologies are rather difficult to be deployed in historical buildings, either due to high costs imposed by installing and maintaining the necessary wired infrastructure, or even due to several applied prohibitive legislations.

(*continued on page 2*)

Structural Monitoring of ARTistic and historical BUILding Testimonies (S.M.ART. BUIL.T.)

Prof. Vassilios Chrissikopoulos
Dept. of Informatics, Ionian University
Scientist in charge / Scientific responsible for Ionian University
E-mail: vchris@ionio.gr

S.M.ART. BUIL.T. PROJECT

The project is coming to its (successful) end…

(continued from page 1)

Modern trends on sensor networks nowadays allow the installation of wireless monitoring equipment, able to collect a large volume and variety of data that can be further processed in order to support prevention modelling techniques and strategies.

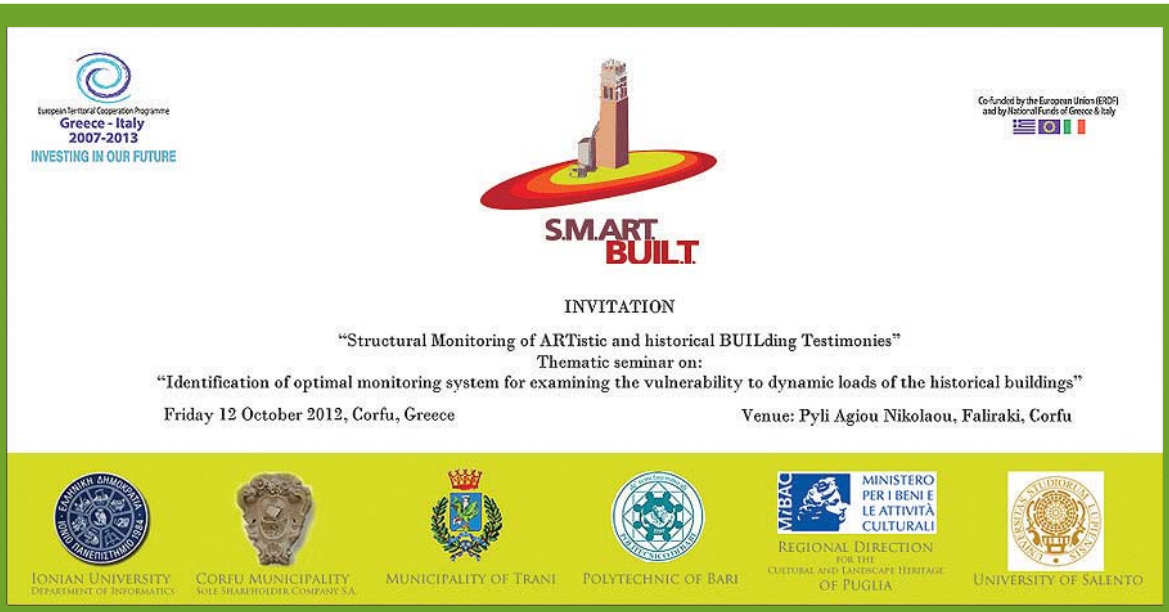
An innovative network architecture was introduced and applied that efficiently combines the benefits of both the wired and wireless systems. Furthermore, an efficient, state-of the-art algorithm developed by our research team successfully overcame the problem of synchronization that this novel architecture inherently imposes.

SMART BUILT

We also achieved to describe the key factors for vulnerability modeling of historical buildings caused by dynamic loads and we managed to underline the generic principles that should be met by building vulnerability assessment methods. Towards this aim, a hybrid model for measuring building vulnerability caused by strong motion arrays was proposed. This model is based on a multi-disciplinary method that is able to accurately predict the behavior of a building structure in reaction to unforeseen stress method

All the above innovative research work and results are included in a number of works/papers that were included in the project International conference proceedings. This conference was successfully organized about 3 months ago in Bari.

Finally, I invite you to fully immerse in the experience in the hope that this final SMARTBUILT newsletter issue will be the starting point for future collaborations and scientific events in the area of historic building monitoring and vulnerability assessment and modeling.



CORFU SEMINAR

October 12-13, 2012

A thematic seminar on "Identification of optimal monitoring system for examining the vulnerability to dynamic loads of the historical buildings" was orghanized as a part of the "S.M.ART. BUIL.T. - Structural Monitoring of ARTistic and historical BUILding Testimonies" project, implemented under the European Territorial Cooperation Program Greece – Italy, 2007 – 2013 and co- financed by the European Union (ERDF) and by National Funds of Greece and Italy.

The overall objective of the meeting was to enhance cooperation among the selected institutions of the two countries (Greece and Italy) towards facilitating the elaboration of historical buildings preservation methods and the implementation of policy guidelines.

The specific objective of the joint thematic seminar was to present at the broad public the so far project's results, especially for the developing monitoring system, and also to develop capacities with the Local Authorities to facilitate the implementation of historical buildings preservation methods, by increasing understating of the way that the available funding is distributing at local level.

The event was organized by the Corfu Municipality Sole Shareholder Co. S.A.. It was held at the offices of the Company, Pyli Agiou Nikolaou, Faliraki, 49100 Corfu.

Seminar agenda

At the beginning of the seminar, Mr George Mamalos (President of Boards of Directors of Corfu Municipality Sole Shareholder Co. S.A.) Prof. Vassilios Chrissicopoulos (Head of the Department of Informatics of Ionian University) provided a warm welcome to all seminar participants. Next, a number of speakers belonging to the project research team presented the scope and aims of the project, as well as the current progress and estimated perspectives.

In Particular, Prof. Dora Foti, head of the project Leading Partner (Polytechnic of Bari) gave the seminar keynote speech entitled 'S.M.ART. BUIL.T. – Project overview'.

Next, Prof. Nicola Ivan Giannoccaro, Electronic Engineer, Professor at University of Salento presented his talk on 'S.M.ART. BUIL.T. Technical aspects of modal parameters dynamic identification for interested buildings'.

Mr Stelios Birbilis, Architect from National Technical University of Athens, talked about the Venetian Architecture of the Town of Corfu, followed by Mrs Tatiana Branca, Engineer from the Regional Direction for the Cultural and Landscape Heritage of Puglia who presented the urban development and notes on the seismic history of Trani.

On behalf of Corfu Municipality, Mrs Mary Mitropia, Architecture, Head of Old City Office gave a presentation entitled 'Historical Buildings of Corfu', while Dr. Kostas Oikonomou, from Ionian University presented

Corfu Seminar
Oct. 12-13 2013

the S.M.ART. BUIL.T. wireless sensor network targeted to analysis and implementation of the actual building structural monitoring.

The seminar concluded through a Questions and Answers session moderated by Prof. Dora Foti.

S.M.ART. BUIL.T. Project web site

You may visit http://www.smartbuilt.eu for a full project details

1st International Workshop

On November 30, 2012, the first Workshop of S.M.ART. BUIL.T. Project entitled “Structural Health Monitoring of Historical Towers: Sensor Network and FEM Modeling”, was held in Bari. Its main aim was to present the initial project results to a technical audience like engineers and architects interested in structural monitoring and historical buildings restoration. Project Partners presented some important outcomes of the work carried out from the beginning of the project. In particular:

Dr. Spiros Vasiliadis, General Director of Corfu Municipality Sole Shareholder Company SA, made an intervention titled “Historical Public Buildings of Corfu”, to show five Public buildings of the historical Center of Corfù, with important historical, cultural and architectural values, and to highlight the importance of the SMART BUILT implementation for the preservation and the restoration of these kinds of buildings.

Dr. Tatiana Branca, expert of MIBAC, made an intervention titled: Seismic history and previous restorations of the two case studies of Trani, whose aim was to present the seismic history of Trani and to show the importance of restoration for earthquake resistant purpose, inter alia on the two case studies of the SMART BUILT Project. Particularly restoration interventions regarding the Castel of Trani (so its clock tower) and the Bell tower of the Cathedral (which in the Fifties was disassembled and rebuilt with the use of its same blocks - anastylosis) were analyzed.

Prof. Konstantinos Oikonomou from Ionian University, presented a speech titled "Advanced structural monitoring through wireless sensor technologies" to make audience aware about the opportunities offered by wireless technologies in order to realize a non-destructive structural monitoring.

Prof. Andreas Floros, Ionian University, presented the “Deployment and assessment of the sensor-based monitoring infrastructure on historical buildings: the design process" which described in detail the design process to be followed for deploying the sensors’ equipment on the historical buildings selected in the two historical centers of Corfu and Trani.

Dr. Maria Francesca Sabbà and Dr. Francesco Tucci, for the Technical University of Bari, presented, respectively, some preliminary results about the ambient vibrational monitoring of Annunziata tower in Corfu and the Cathedral bell tower in Trani”.

Workshop Agenda

29/11/2012

14.00 – 14.15
Reception and check in
14.15 – 15.00
Welcoming of the Polytechnic of Bari
Prof. N. Costantino, Rector Polytechnic of Bari
Prof. C. D’amato Guerrieri, Director DICAR
Prof. S. Marzano, Scientific Responsible Laboratory "Test and Materials - M. Salvati"
Welcoming of the authorities
15.00 – 15.15
Prof. D. Foti, Project Responsible
"S.M.ART. BUIL.T.— A project overview"
15.15 – 15.30
Mr S. Vasiliadis, General Director of Corfu Municipality Sole Shareholder Co S.A.
"Historical public buildings of Corfu"
15.30 – 15.45
Mrs. T. Branca, Regional Direction for the Cultural and Landascape Heritage of Puglia
"Seismic History and previous restorations of the two case studies of Trani"
15.45 – 16.00
Coffee break
16.00 – 16.15
Prof. K. Oikonomou, Department of Informatics Ionian University
"Deployment and assessment of the sensor-based monitoring infrastructure on historical buildings: the design process"
16.15 – 16.30
Prof. A. Floros, Department of Informatics Ionian University
"Advanced structural monitoring through wireless sensor technologies"
16.30 – 16.45
Mrs. M. F. Sabbà, Polytechnic of Bari
"Ambient vibrational monitoring: Annunziata tower in Corfu"
16.45 – 17.00
Mr. F. Tucci, PhD student Polytechnic of Bari
"Ambient vibrational monitoring: Cathedral bell tower in Trani "
17.00 – 18.00
Round table and discussion with the speakers

30/11/2012

10.00 – 11.00
Technical session: visit and testing in laboratory *
11.00 – 11.15
feedback from the partecipants
11.15 – 11.30
end of works

* It’s required the reservation to participate to the visit

S.M.ART. BUIL.T.

November 29 - 30, 2012

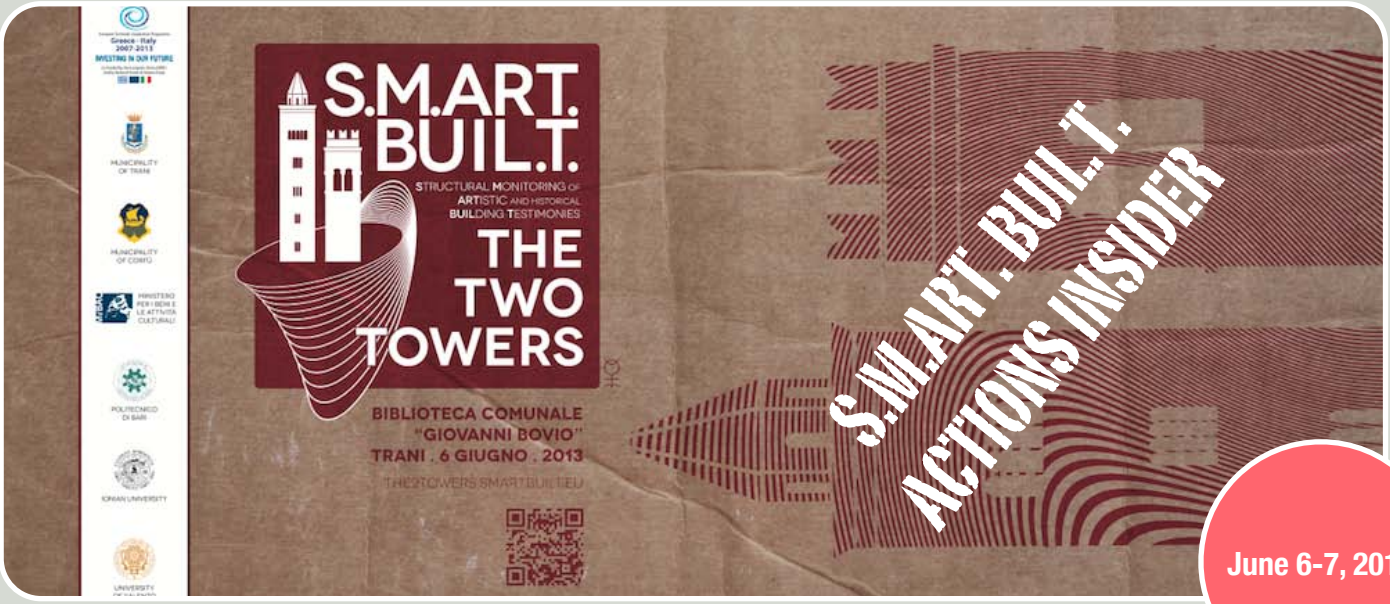
ACTIONS INSIDER

Meeting in Trani: “Tests Initiation”

The meeting was hosted in Trani, aiming to initiate the comparison tests between the classical, fully wired monitoring sensor network system to the novel wireless one assembled by the dept. of Informatics- Ionian University. The comparison tests were held on the bell tower of the Cathedral of Trani.

Unfortunately at that time, the wireless system did not guarantee a sufficient high sampling time for permitting realistic elaboration for the dynamic identification of modal parameters. Further tests will be carried out in the next steps of the project implementation.

May 10, 2013

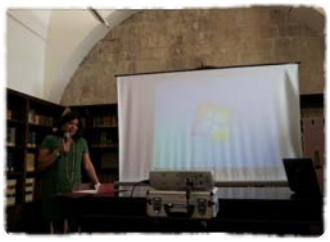


June 6-7, 2013

The Two Towers - A S.M.ART. BUIL.T.

The "Two Towers" Seminar was held in Trani, Italy, on June 6-7, 2013. S.M.ART. BUIL.T. partners representatives participated in a high-quality scientific action, giving presentations and exchanging ideas and thoughts in various aspects that are related to the project.

More specifically, Mrs Tatiana Bianca (MIBAC) gave the first lecture on the results of the research on the old town's evolution and seismic history of the city of Trani. Next, Mr. Francesco Tucci presented the experimental tests and FEM modeling updates for the Bell Cathedral of Trani. Dr. Nicola Ivan Giannoccaro (University of Salento) talked about the dynamic identification and modeling of the Annunziata tower, followed by Francesco Paparella that provided an interpretation of a stochastic signal for monitoring and collecting data. Last but not least, Dr. Panayiotis Vlamos from Ionian University concluded the seminar with a talk on sensor network, data collection and modeling.



Workshop Agenda

Tuesday, July 9th 2013

16:00 – 16:30 **Welcome reception and registration**

16:30- 16:40 **Welcome messages**
Prof. Vassilios Chrissikopoulos, Dept. of Informatics, Ionian University Associate Prof. Dora Foti, Project Scientific Respon sible, Polytechnic of Bari

Session 1 Coordinator: M. Magkos, Ionian University

16:40 – 17:00 Non-destructive Characterization and Dynamic Identifica tion of the Annunziata Tower of Corfu
Assist. Prof. Nicola Ivan Giannoccaro, University of Salento

17:00 – 17:20 Stochastic Modeling and Structural Identification Analysis of Experimental Tests
Lecturer Markos Avlonitis, Dept. of Informatics, Ionian University

17:20 – 17:40 The Bell Tower of Trani Cathedral Experimental Tests , Structural Identification and FEM Model Updating
Dr. Maria Francesca Sabbà, Politechnic of Bari

Coffee Break

Session 2 Coordinator: A. Floros, Ionian University

18:00 – 18:20 Accuracy of prediction models of time- and space-depen dent vulnerability of historical buildings
Associate Prof. Panayiotis Vlamos, Dept. of Informatics, Ionian University

18:20 – 18:40 Historical valuations about the bell tower of the Trani's cathedral
Donatella Campanile, Regional Direction for the Cultural and Landscape Heritage of Puglia

18:40 – 19:00 The S.M.A.RT. BUIL.T Wireless Network: going through a novel architecture
Assist. Prof. Konstantinos Oikonomou, Dept. of Informatics, Ionian University

19:00 – 19:30 Round Table: "From Monitoring to Modeling – Towards an Integrated and Effective Structural Identification and Preservation"
Coordinator:Panayiotis Vlamos, Dept. of Informatics, Ionian University

19:30 Workshop Closing

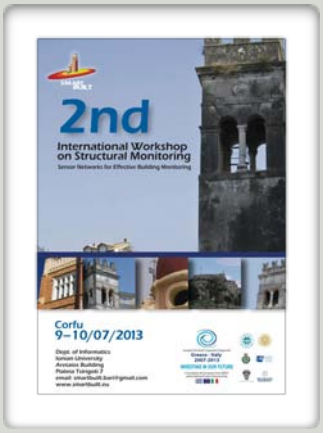
Wednesday, July 10th 2013

11:00 – 13:00 Project steering committee meeting (Faliraki)

A S.M.ART. BUIL.T. Workshop

The Workshop was held in Corfu, Greece, on July 9-10, 2013. The main objective of the workshop was to provide a summary of the best practices derived through the current progress S.M.ART BUIL.T project related to the employment of modern types of sensor networks as effective means for monitoring old buildings. These practices typically include novel approaches on the design and deployment of the overall sensor network infrastructure, taking into account the particularities of the buildings under monitoring imposed by their age and monument nature.

The workshop was targeted to local authorities and municipal technical agencies, as well as teachers, professionals and students who are interested in extending their knowledge on the state-of-the-art topic of historical building seismic prevention and rehabilitation building through sensor networks.



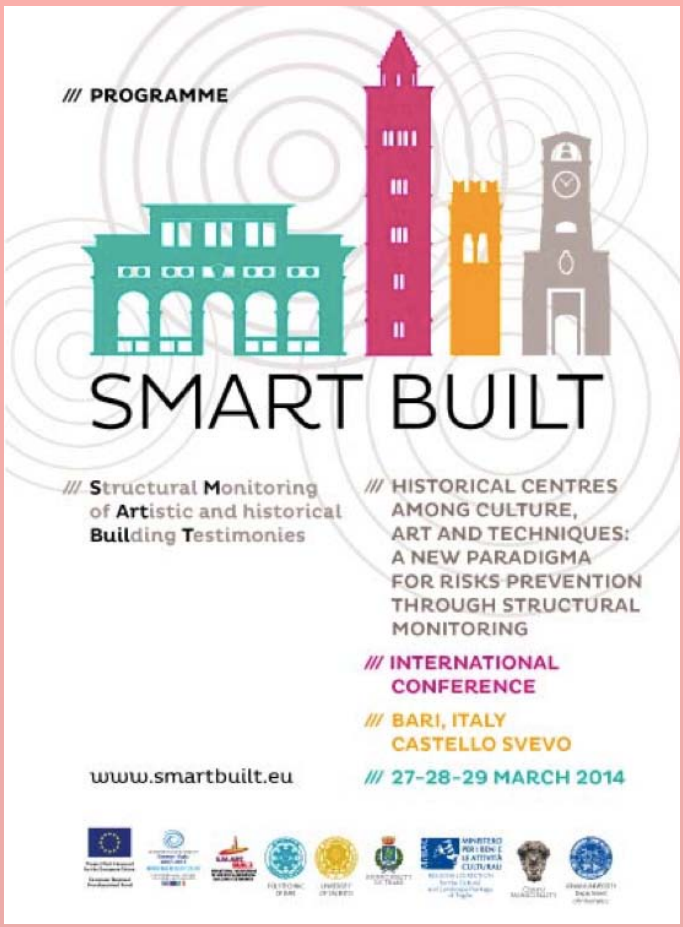
S.M.ART. BUIL.T. PROJECT ACTIONS INSIDER

S.M.ART.BUIL.T. Conference

The International Conference titled "HISTORICAL CENTRES AMONG CULTURE, ART AND TECHNIQUES: A NEW PARADIGMA FOR RISKS PREVENTION THROUGH STRUCTURAL MONITORING" was the most important action of diffusion activities of the S.M.ART.BUIL.T. project. It was an open to all experts in many state-of-the-art topics, including seismic and structural monitoring, historical and artistic heritage in order to exchange experience of correlated research areas. The purpose for the conference organization was to establish a forum for the efficient dissemination of the latest scientific and technical developments and for the wide exchange of new ideas in emerging topics that lay within the the project scientific focus.

The international conference was organized in Bari Italy, on March 27-29, 2014.

Invited lectures on specific topics strictly related with the major research issues were alternated with presentations on several topics of general interest, forming a high-quality technical program. A book of abstracts was also distributed during the conference and extended versions of selected papers are now considered for publication in peer-reviewed journals.



March 29-29, 2014

S.M.ART. BUIL.T. Project International Conference

Technical Program Details

THURSDAY 27 MARCH

h 16.00 p.m. REGISTRATION

h 16.30 p.m. OFFICIAL OPENING CEREMONY
Chairman: ***Mrs Annamaria Lorusso***
Supervisor Castello Svevo Bari
Mr Salvatore Buonomo
Supervisor MiBac SBAP Bari Foggia Puglia
Mr Elio Sannicandro
Council Member of Bari
Mr Luigi Nicola Riserbato
Major of Trani
Mr Ioannis Trepeklis
Major of Corfu

h 17.00 p.m. STRATEGIC DIRECTIONS ON THE PROTECTION OF ARCHITECTURAL HERITAGE
Mrs Maria Carolina NARDELLA
Manager of Regional Directorate for Cultural Heritage and Landscape of Puglia
Mr Eugenio Di Sciascio
Dean of Polytechnic in Bari
Mr Vincenzo Zara
Dean of University of Salento
Mr Claudio D'Amato Guerrieri
Senior Manager of Icar Dept (Polytechnic of Bari)

h 18.00 p.m. SMART BUILT PROJECT RESULTS
Ms Dora Foti
Project Manager (Polytechnic of Bari)
Mr Nicola Ivan Giannoccaro
Partner Manager P2 (University of Salento)
Ms Francesca De Benedictis
Partner Manager P3 (Trani Municipality)
Mr Francesco Longobardi
Partner Manger P4 (MIBACT)
Mr Stefanos Karoumbis
Partner Manager P5 (Corfu Municipality)
Mr Vassillis Chrissikopoulos
Partner Manager P6 (Ionian University)

h 19.00 p.m. Cocktail and Concert

FRIDAY 28 MARCH

HISTORICAL AND ARTISTIC AREA

Chairman: ***Francesca Marmo***
9,30 – 10,00 Keynote lecture
OBJECTIVES AND CHALLENGES OF HISTORICAL MONUMENTS DYNAMIC MONITORING. TWO CASE STUDIES: THE COLOSSEUM AND THE TOWER OF PISA
Camillo Nuti, *Università degli Studi Roma Tre*

10,00 – 10,30 Keynote lecture
THE HARBOUR OF TRANI: URBAN HISTORY AND TOPICAL ISSUES OF PRESERVATION
Andrea Pane, *Università degli Studi di Napoli*

10,30 – 10,45 Coffee break

Chairman: ***Francesco Longobardi***
10,45 – 12,00 Technical session

URFA: the planned city and the process of medievalization
Matteo Ieva

On the morphology and history of roman and medieval seismic design
Alessandro Camiz

Morphological, typological and structural characters of the old centers in the center of coastal Apulia: some instruments for the safeguard and the recovery of their architectural heritage
Antonio Vito Riondino

The old city of Jerusalem between heritage and urban renewal: public buildings and typological aspects
Giuseppe Francesco Rociola

Fire risk assessment of Italian architectural heritage: a index based approach
Alessandro Arborea, Giorgio Mossa, Giorgio Cucurachi

STRUCTURAL AREA

Chairman: ***Salvador Ivorra***
12,00 – 12,30 Keynote lecture
HERITAGE BUILDINGS. CONSERVATION PRINCIPLES AND STRUCTURAL VERIFICATION
Pere Roca Fabregat, *Universitat Politècnica de Catalunya*

12,30 – 13,30 Technical session
Structural behaviour of historical stone arches and vaults: experimental tests and numerical analyses
Marco Bovo, Claudio Mazzotti, Marco Savoia

Seismic behaviour analysis of classes of masonry arch bridges
Paolo Zampieri, **Mariano Angelo Zanini,** Rocco Zurlo

Dynamic monitoring and seismic response of a historic masonry tower
Antonella Saisi, Carmelo Gentile, Marco Guidobaldi, Man Xu

Vulnerability reduction procedures in ordinary urban management. The Urban Building Code of Faenza
Caterina F.Carocci, **Pietro Copani,** Lucia Marchetti, Cesare Tocci

13,30 – 14,30 Lunch

Chairman: ***Vincenzo Gattulli***
14,30 – 15,00 Keynote lecture
A NEW THEOREM FOR DAMAGE LOCALIZATION
Dionisio Bernal, *Northeastern University, Boston*

15,00 – 16,30 Technical session
Strength performance of unreinforced brick masonry walls under flexo-compression load. Analytical methods
Ernest Bernat-Masca, **Lluis Gilb**

One-year monitoring of a bell tower
Reto Cantieni

Identifying seismic local collapse mechanisms in unreinforced masonry buildings through 3D laser scanni
Chiara Andreotti, Domenico Liberatore, **Luigi Sorrentino**

Mechanical characterization of building stones through DT and NDT tests: research of correlations for the in situ analysis of ancient masonry
Maria Antonietta Aiello, Angela Calia, Giovanni Leucci, Francesco Micelli, Maria Sileo, **Emilia Vasanelli**

Buildings behaviour in the urban fabric: the knowledge issue in the post-earthquake reconstruction plans
Caterina F. Carocci, **Chiara Circo**

Buildings behaviour in urban fabric: the safety assessment issue in the post earthquake reconstruction plans
Serena Cattari, **Sergio Lagomarsino,** Daria Ottonelli, Michela Rossi

16,30 – 16,45 Coffee break

Chairman: ***Mariella Diaferio***
16,45 – 18,30 Technical session
In-situ investigations for the seismic assessment of existing bridges
Claudio Modena, Carlo Pellegrino, Paolo Zampieri, **Mariano Angelo Zanini**

Mechanical characterization of Apricena marble by ultrasonic immersion tests
Anna Castellano, Pilade Foti, Aguinaldo Fraddosio, Salvatore Marzano, Mario Daniele Piccioni

Seismic behavior of a masonry chimney with severe cracking condition: Preliminary study.
F. Javier Baeza, David Bru, **Salvador Ivorra,** Borja Varona

Diffusive structural monitoring for a smart city in a seismic area
Andrea Colarieti, Marco Faccio, Fabio Federici, **Vincenzo Gattulli,** Fabio Graziosi, Francesco Potenza

Large-scale seismic vulnerability assessment method for urban centres. An application to the city of Florence
Pauline Deguy, Mario De Stefano, Giorgio Lacanna, Valentina Mariani, Maurizio Ripepe, Marco Tanganelli

Analysis of operational modal identification techniques performances and their applicability for damage detection
Andrea Antonio Rizzo, Nicola Ivan Giannoccaro, Antonio Messina

Input Deconvolution in Linear Time Invariant Systems
Dionisio Bernal, **Alessia Ussia**

SATURDAY 29 MARCH

COMPUTATIONAL AND TECHNOLOGICAL AREA

Chairman: ***Andreas Floros***
9,30 – 10,00 Keynote lecture
EARTHQUAKE PROTECTION OF MONUMENTS, OF THEIR CONTENT AND ATTACHMENTS BY AN UNDERGROUND SUSTAINABLE EARTHQUAKE REDUCTION SYSTEM
Carydis Panayotis, *National Technical University of Athens*

10,00 – 10,30 Technical session
Building Vulnerability: An Interdisciplinary Concept
Vassilios Chrissikopoulos, **Maria Psiha,** Panayiotis Vlamos

Dynamic testing of masonry towers using the microwave interferometry
Carmelo Gentile, Antonella Saisi

10,30 – 10,45 Coffee break

Chairman: ***Panayotis Vlamos***
10,45 – 12,15 Technical session
Hearing the buildings: Smart Monitoring through Advanced Sonification Approaches
Vassilios Chrissikopoulos, **Andreas Floros,** Elena Vlamou

A dynamic identification of a historical building using accelerometers with interface modules and a digital synchronization method
Iro Armeni, Markos Avlonitis, Nicola Ivan Giannoccaro, **Sozon Papavlasopoulos,** Luigi Spedicato

A NN-based approach for monitoring early warning of risk in historical buildings via image novelty detection
Leonarda Carnimeo, Rosamaria Nitti

A Wireless Sensor Network Innovative Architecture for Ambient Vibrations Structural Monitoring
Vassilis Chrissikopoulos, Eleni Kavvadia, George Koufoudakis, **Konstantinos Oikonomou**

Probabilistic information dissemination aspects in wireless sensor networks located in historical buildings
Konstantinos Skiadopoulos, **Konstantinos Oikonomou**

Synchronization Issues in an Innovative Wireless Sensor Network Architecture Monitoring Ambient Vibrations in Historical Buildings
George Koufoudakis, Emmanouel Magkos, **Konstantinos Oikonomou,** Nikos Skiadopoulos

Poster session
Non-destructive techniques and monitoring for the damage evolution detection on masonry structures in an ancient urban landslide area
Rosella De Cadilhac, Dora Foti

Seismic response of a historic masonry construction isolated by stable unbonded fiber-reinforced elastomeric isolators (SU-FREI)
Anna Castellano, Pilade Foti, Aguinaldo Fraddosio, Salvatore Marzano, **Gemma Mininno,** Mario Daniele Piccioni

Dynamic analysis of an historic fortified tower
Mariella Diaferio

Identification of the modal properties of a building of the Greek heritage
Mariella Diaferio, Dora Foti, Nicola Ivan Giannoccaro

Hybrid Model for Measurement of Building Vulnerability
Adamantia Pateli, **Maria Psiha,** Panayiotis Vlamos

12,15 – 12,30 Closing ceremony

EPolis Bari

CASTELLO SVEVO / INCONTRI E DIBATTITI IN PROGRAMMA FINO AL 29

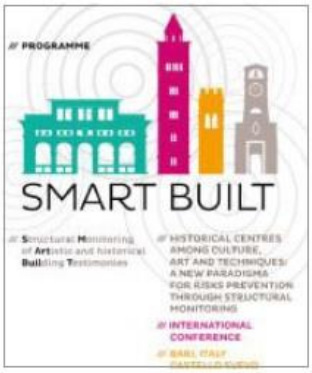
Al via i lavori di Smart Built

L'assessore all'Urbanistica del Comune Elio Sannicandro parteciperà questo pomeriggio, alle 16, al Castello Svevo, alla giornata inaugurale della Conferenza Internazionale S.m.art Buil.t.

Il tema della Conferenza è "I centri storici tra cultura arte e tecniche: un nuovo paradigma per la prevenzione dai rischi attraverso il monitoraggio strutturale".

I lavori dell'edizione di quest'anno si protrarranno fino a sabato 29 marzo.

"S.m.art Buil.t - è spiegato in una nota di Palazzo di città - è l'acronimo dall'inglese di "Monitoraggio strutturale delle testimonianze storico-artistiche", è patrocinato dal Fondo europeo di Sviluppo regionale (Fesr), dal Programma di Cooperazione internazionale Italia-Grecia, dal Politecnico barese, dal ministero del Turismo e delle Attività culturali, in collaborazione con il Comune di Trani e anche con alcune istituzioni elleniche".



La locandina dell'appuntamento

affaritaliani.it

Ad aprire il convegno saranno: **Annamaria Lorusso**, direttore del Castello Svevo di Bari, **Salvatore Buonomo**, soprintendente dei Beni Architettonici e Paesaggistici della Puglia, **Elio Sannicandro**, assessore all'Urbanistica del Comune di Bari, **Giacomo Ceci**, assessore ai Lavori Pubblici del Comune di Trani e **Ioannis Trepeklis**, sindaco di Corfù.

Seguiranno le relazioni sulle "Indicazioni strategiche sulla tutela del patrimonio architettonico" a cura di: **Maria Carolina Nardella**, responsabile della Soprintendenza archivistica della Puglia, **Eugenio Di Sciascio**, rettore del Politecnico di Bari, **Mariaenrica Frigione**, vice rettore dell'Università del Salento, **Loredana Ficarelli**, vice direttore del Dipartimento Icar del Politecnico di Bari. A seguire saranno illustrati i risultati del progetto da: **Dora Foti**, responsabile del progetto 'S.M.ART. BUIL.T.', e dai *partner manager* **Nicola Ivan Giannoccaro**, per l'Università del Salento, **Francesca De Benedictis**, per il Comune di Trani, **Francesco Longobardi**, per il Ministero dei Beni e delle Attività Culturali e del Turismo, **Stefanos Karoumbis**, per il Comune di Corfù e **Vassillis Chrissikopoulos**, per la Ionian University di Corfù.

La seconda giornata della conferenza, che si terrà venerdì 28 marzo, comincerà alle 9:30 e verterà sui temi: "Obiettivi e sfide dei monumenti storici e monitoraggio dinamico. Due casi: il Colosseo e la Torre di Pisa"; dalle 10 "Il porto di Trani: storia urbana e attualità di conservazione"; dalle 12 "Edifici storici. Principi di conservazione e verifica strutturale"; dalle 14:30 "Un nuovo teorema sulla localizzazione dei danni".

Nella terza giornata, sabato 29, dalle 9:30 si discuterà di "Protezione dei monumenti e del loro contenuto dal terremoto attraverso un sistema sotterraneo sostenibile di riduzione del terremoto stesso".

GO bari.it PARLA LA CITTA'

Progetto "Smart built", il Politecnico a tutela degli edifici storici

Italia e Grecia unite nel progetto europeo guidato dal Politecnico per la prevenzione di edifici storici dai rischi di crolli

Bari - Le azioni dell'uomo o eventi straordinari come i terremoti, sono da sempre state due delle maggiori cause scatenanti di crolli totali o parziali di edifici, in particolare quelli storici. Il monitoraggio strutturale per conoscere il loro stato di salute diventa indispensabile per poter prevenire potenziali rischi. Nasce con questo scopo **il progetto pilota europeo, guidato dal Politecnico, "Smart built"**, che coinvolge alcune Università pugliesi, oltre all'Università Ionia di Corfù, i Comuni di Trani e Corfù e la Direzione Regionale Puglia del Ministero per i Beni e le Attività Culturali. Ad essere analizzate, per conoscere il loro comportamento ad agenti esterni, quali azioni dell'uomo, traffico ed inquinamento, **la Cattedrale di Trani e la Torre dell'Annunziata di Corfù.**

I dati sullo stato di salue di questi due importanti monumenti, uniti allo stato di avanzamneto della ricerca, verranno presentati, mediante un workshop, giovedì 29 novembre alle 15, presso il Dipartimento di Scienze dell'Ingegneria civile e dell'Architettura, al Politecnico di Bari. L'obiettivo è quello di presentare i risultati progettuali conseguiti, uniti allo sviluppo del sistema di monitoraggio, così da sviluppare una metodologia di salvguardia degli edifici storici, ottimizzando la distribuzione dei fondi disponibili.

Clicca qui per il programma dettagliato dell'evento.

FINO A SABATO AL CASTELLO SVEVO

Conferenza internazionale sui centri storici

Da oggi a sabato 29 marzo, al Castello Svevo di Bari, si svolgeranno i lavori della conferenza internazionale «I centri storici tra cultura, arte e tecniche: un nuovo paradigma per la prevenzione dei rischi attraverso il monitoraggio strutturale». Si tratta di un evento promosso da S.m.art. buil.t. (Structural monitoring of artistic and historical building testimonies), un progetto del Politecnico di Bari finanziato dal programma di cooperazione territoriale tra Grecia e Italia, 2007-2013 «Invest in Our Future».

LA GAZZETTA DI BARI

“How Local Administrative Authorities can take advance from the results of S.M.ART. BUIL.T. Project”

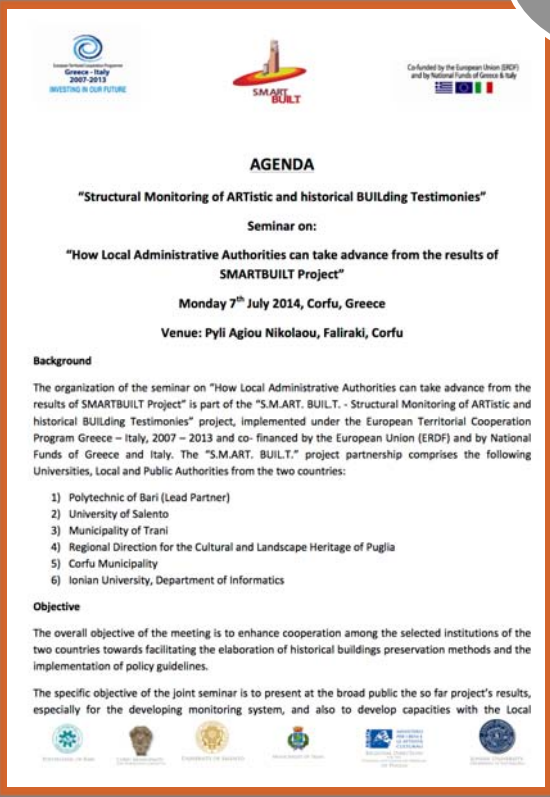
A S.M.ART. BUIL.T. Seminar

July 6, 2014

The overall objective of the meeting is to enhance cooperation among the selected institutions of the two countries towards facilitating the elaboration of historical buildings preservation methods and the implementation of policy guidelines.

The specific objective of the joint seminar is to present at the broad public the so far project’s results, especially for the developing monitoring system, and also to develop capacities with the Local Authorities to facilitate the implementation of historical buildings preservation methods, by increasing understating of the way that the available funding is distributing at local level.

Seminar Agenda



Greece - Italy 2007-2013 INVESTING IN OUR FUTURE

S.M.ART BUILT

Co-funded by the European Union (ERDF) and by National Funds of Greece & Italy

AGENDA

“Structural Monitoring of ARTistic and historical BUILding Testimonies”

Seminar on:

“How Local Administrative Authorities can take advance from the results of SMARTBUILT Project”

Monday 7th July 2014, Corfu, Greece

Venue: Pyli Agiou Nikolaou, Faliraki, Corfu

Background

The organization of the seminar on “How Local Administrative Authorities can take advance from the results of SMARTBUILT Project” is part of the “S.M.ART. BUIL.T. - Structural Monitoring of ARTistic and historical BUILding Testimonies” project, implemented under the European Territorial Cooperation Program Greece – Italy, 2007 – 2013 and co- financed by the European Union (ERDF) and by National Funds of Greece and Italy. The “S.M.ART. BUIL.T.” project partnership comprises the following Universities, Local and Public Authorities from the two countries:

1) Polytechnic of Bari (Lead Partner)
2) University of Salento
3) Municipality of Trani
4) Regional Direction for the Cultural and Landscape Heritage of Puglia
5) Corfu Municipality
6) Ionian University, Department of Informatics

Objective

The overall objective of the meeting is to enhance cooperation among the selected institutions of the two countries towards facilitating the elaboration of historical buildings preservation methods and the implementation of policy guidelines.

The specific objective of the joint seminar is to present at the broad public the so far project’s results, especially for the developing monitoring system, and also to develop capacities with the Local

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Authorities to facilitate the implementation of historical buildings preservation methods, by increasing understating of the way that the available funding is distributing at local level.

Organization

The event is organized by the Corfu Municipality It will be held at the offices of the Company, Pyli Agiou Nikolaou, Faliraki, 49100 Corfu.

Language and Format

The seminar will be conducted in English, though English/Greek translation will be available during the seminar session. They will have an interactive character, including plenary presentations and group discussions.

Seminar program

17:00 – 17:30 Arrival and registration of participants

17:30 – 18:00 Greetings (Introducing speeches)

- Representative of Corfu Municipality
- Prof. Vassilios Chrissicopoulos, Professor at Department of Informatics Ionian University
- Prof. Dora Foti, Civil Engineer, Professor at Polytechnic of Bari

18:00 – 18:30 Lecture by Ms Margarita Samoili, Engineer for urban Planning,: “Typification of Structures at the historical centre of Corfu”

18:30 – 19:00 Lecture by Ms Aggeliki Thymi , Architect, ETH Zurich, MAS in Urban strategies and housing, **‘Presentation title : Evaluative stages at the historic centre:’**

19:00 – 19:30 Coffee break

19:30 – 20:00 Lecture by Prof. Nicola Ivan Giannoccaro, *Electronic Engineer, Professor at University of Salento*: **‘Monitoring of the clock tower in Trani using forced and environmental test’**

20:00 – 20:30 Lecture by Mr Andreas Karamanos, Civil Engineer,: **‘Rapid (visual) pre-earthquake assessment in Greece’**

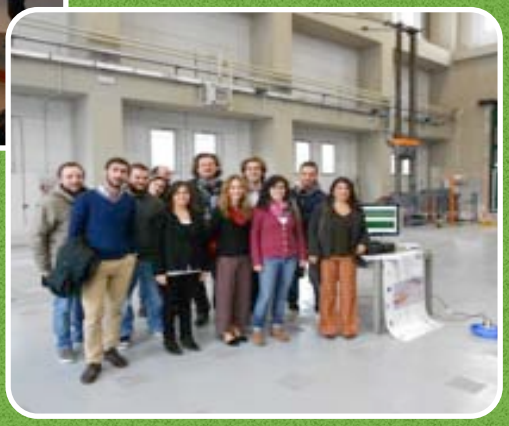
20:30 – 21:00 Lecture by Prof. Mariella Diaferio , Civil Engineer, Professor at Polytechnic of Bari **“Identification of the modal properties of San Giacomo building”**

21:00 – 21:30 Questions and Answers session – Conclusions

21:30 End of Seminar

S.M.ART.BUIL.T. Project in Photos



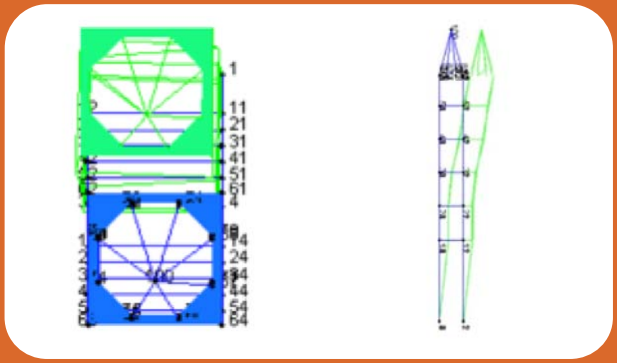


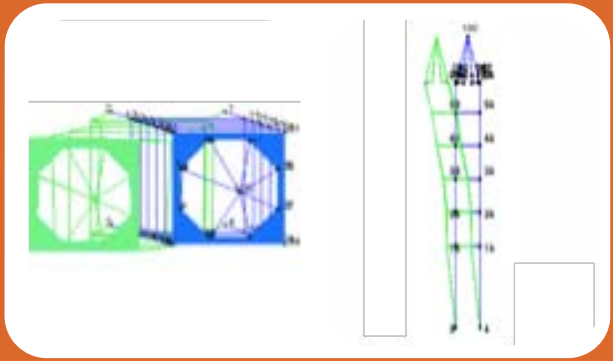


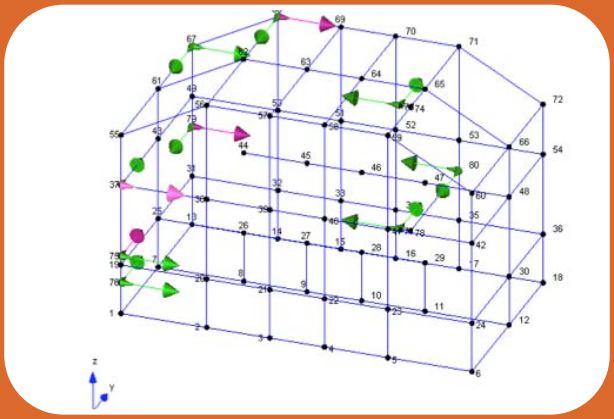




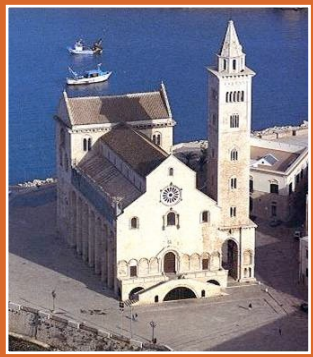
STRUCTURAL MONITORING







THE BUILDINGS



Trani and Corfu Buildings

The Bell Tower, Trani: the Cathedral dedicated to St. Nicholas the Pilgrim
The Clock Tower, Trani: The Swebian Castle
San Giacomo, Corfu: The building that accommodates the Town Hall of Corfu, initially built as a Lodge for the Nobles (Loggia dei Nobili)
Annunziata, Corfu: the Catholic church of Lontsiada, devoted to the Annunciation and to Aghia Loukia.

Experimental Measurements

The experimental structural measurements on the selected buildings are now in full progress. Based on existing and innovative, state-of-the-art measurement approaches, the dynamic responses of the buildings under ambient and/or artificial loads will be obtained for delivering realistic scenarios on seismic vulnerability assessment via monitoring.

SENSOR EQUIPMENT

PUBLICATIONS

Hearing the buildings: Smart Monitoring through Advanced Sonification Approaches

FLOROS Andreas[1,a], VLAMOU Elena[2,b], and CHRISSIKOPOULOS Vassilios[3,c]
[1]Audiovisual Signal Processing Laboratory, Dept. of Audiovisual Arts, Ionian University, Greece
[2]2Dept. of Civil Engineering, Polytechnic School, Democritus University of Thrace
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Keywords: building risk prevention, sonification, audiovisual representation, real-time monitoring, sensor networks

Abstract. Risk prevention of historical buildings through sensor network monitoring represents a challenging and together promising task towards an optimized buildingsé protection plan. Due to the significant character that historical buildings have within the history and identity of local and consequently national communities, the monitoring approach above is nowadays considered a fundamental component of cultural preservation. Modern trends on sensor networks nowadays allow the installation of wireless monitoring equipment, able to collect a large volume and variety of data that can be further processed in order to support prevention modeling techniques and strategies. Despite the valuable post-processing outcome of the above modeling techniques, in several real-time monitoring cases, an aspect that may significant impact the data analysis accuracy from the monitoring engineer is to create an audiovisual representation of the gathered data that are easily perceived and directly associated to well-known environmental conditions. Towards this aim, in this work an audio-based representation of the collected data is introduced that achieves high monitoring performance in terms of the perceived nature of the building vibrations themselves. The proposed audio-based representation technique is based on a number of advanced sonification methods, combined with specific human-hearing simulation mechanisms that allow an effective increase of the represented information volume in real-time. A number of subjective tests that were performed demonstrate a significant improvement on the way that the monitoring personnel can efficiently perceive the origin and / or nature of the acquired vibrations, rendering the proposed technique a strong supplement towards efficient historical building risk prevention.

Introduction

During the last decades, the European community has clearly realized the fundamental role that historic buildings have, not only as subjects for preservation, but mostly as national and regional cultural resources. These structures obviously represent a fundamental component of the history and identity of local communities, affecting in parallel the corresponding local (but also national) economic dimensions.

Following the existing, state-of-the-art standards, all applicable policies that aim to advance the social-economic scales and to improve life are established in parallel with long-term measures for preserving the cultural and historic spot defined by the existence of these buildings. Under this perspective, the impact of existing studies [1, 2] focusing on monitoring and risk prevention (for example due to earthquakes, environmental pollution, noise and traffic conditions) is not exclusively limited to optimizing these buildingsé protection plans, but also aim to further develop the local economic growth.

Building monitoring in most cases results into collecting a high-amount of data provided by sensor devices installed onto the buildings structures. Such a wireless sensor infrastructure is illustrated in

S.M.ART.BUIL.T. Project in numbers

POLYTECHNIC OF BARI

UNIVERSITY OF SALENTO

IONIAN UNIVERSITY
DEPARTMENT OF INFORMATICS

Project Partners

MUNICIPALITY OF TRA

MINISTERO PER I BENI E LE ATTIVITÀ CULTURALI
REGIONAL DIRECTION FOR THE CULTURAL AND LANDSCAPE HERITA OF PUGLIA

MUNICIPALITY of CORFU

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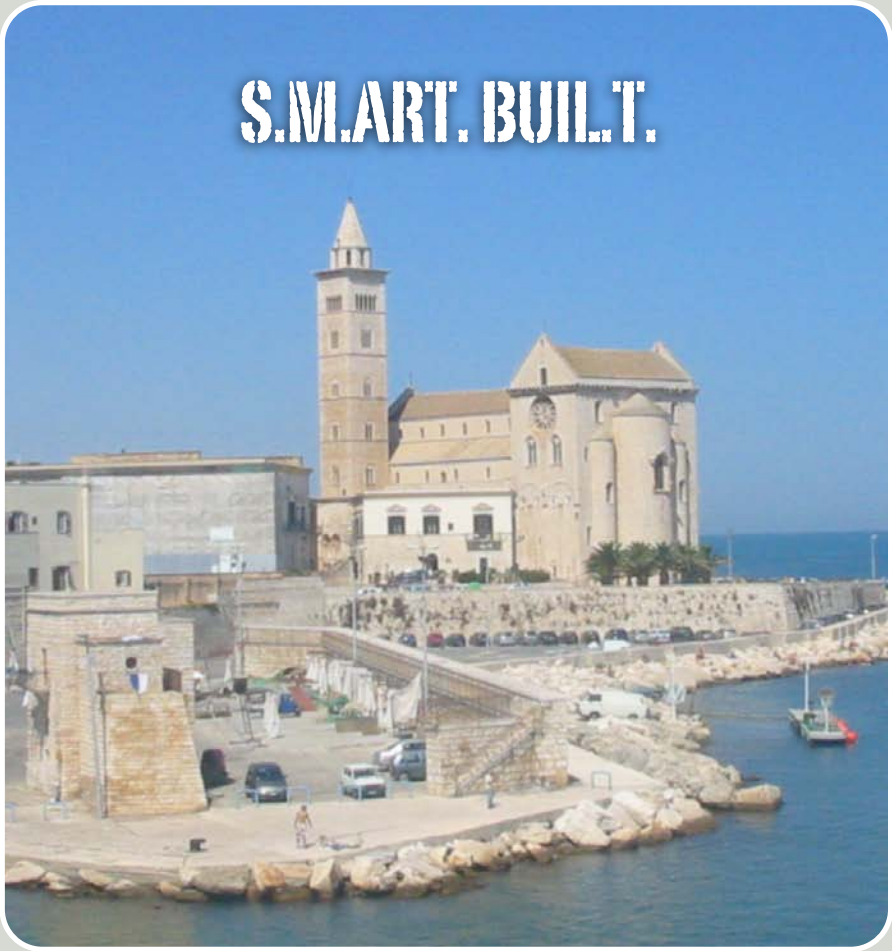

Structural Monitoring of ARTistic and historical BUILding Testimonies

About the newsletter

The S.M.ART.BUIL.T. NEWSLETTER is published every 4 months, conatining information about the progress and the outcomes of the project.

It is electronically distributed in portable document format (pdf). Printed copies can be supplied on demand.

For any additional information regarding this publication, you may contact the publication coordinator via e-mail, using the address smartbuilt.bari@gmail.com