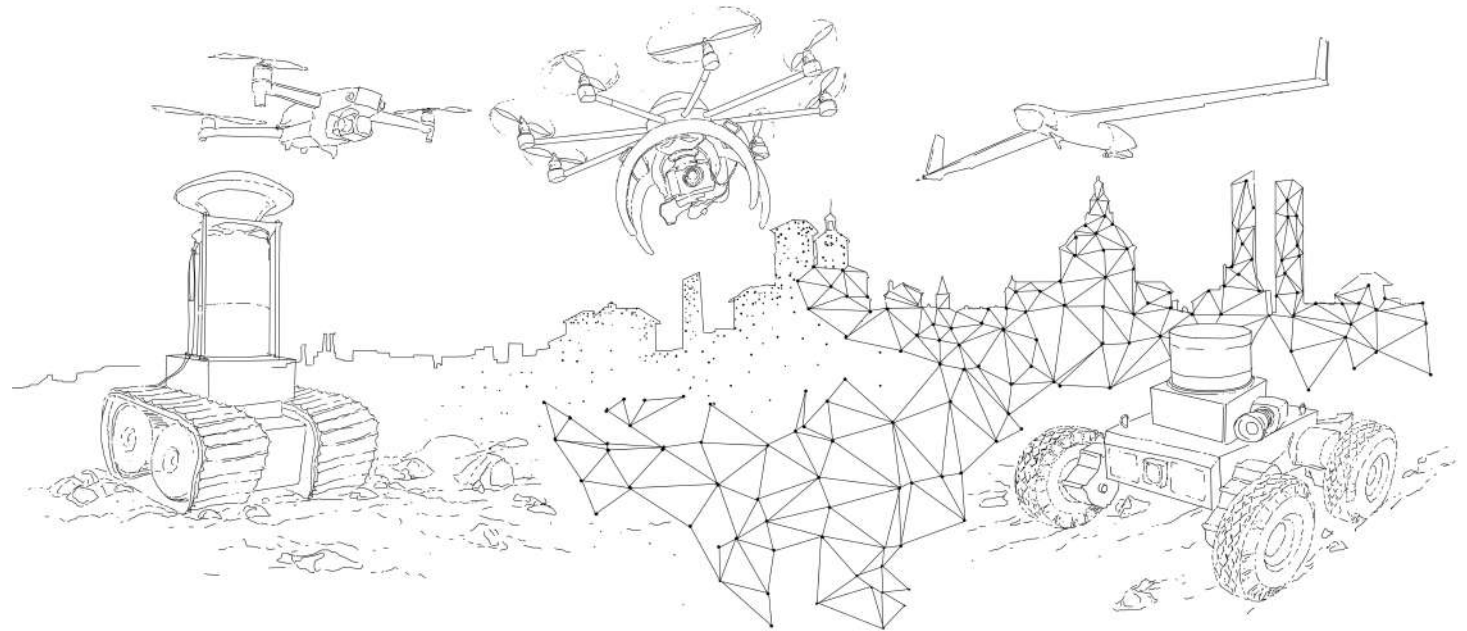




UNIVERSITY OF PAVIA



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D-SITE

Drones - Systems of Information on culTural hEritage

International Conference meeting
16th-18th June 2022, Pavia, Italy

Research experiences for the development of documentation and analysis systems conducted through the use of drones

D-SITE is an International Conference dealing with the use of **drones** in the field of **Cultural Heritage**. It is directed to researchers and experts working for the design of UAVs production and the use of drones for Cultural Heritage digitization, finalizing innovative **documentation services** that integrate and complete the existing practice.

In the last few years, the use of UAVs is becoming increasingly important in many areas related to the science of **architectural survey**, **topography**, **engineering** and **architecture**. Used for **monitoring** and surveying, drones are an opportunity for the development of increasingly effective systems for the documentation.

The event aims to provide a framework of the State of the Art of this phenomenon, laying the foundations for the development of novel systems of analysis and growth of **innovative methodologies** with a **multidisciplinary nature**.

The use of UAVs is increasingly widespread in activities related to Cultural Heritage documentation. In recent years the development of methodologies of **data integration**, obtained through surveys that exploit drones to reach **privileged observation** points, has been witnessed by the numerous **computation platforms**, software and tools, that populate the exchange. The definition of increasingly reliable approaches and procedures of **close-range photogrammetry** has produced considerable results in the survey of Architectural Heritage. Nowadays, several Universities and Research Centers, together with enterprises, are working to optimize documentation services whose goal is, in any case, the **representativeness of technical data** aimed at the project development.

Parallel to aerial documentation, even the application of remote controlled terrestrial drone systems is renewing the inspection and survey practices in architecture and on territory, overtaking barriers and access dimensions to sites and contexts in emergency otherwise impractical for human operators.

Surface rovers and **submarine robotics**, equipped with controlled cameras and implemented survey devices, in terms of stability and compartment, contribute to complete an extremely scientific and innovative field, where the central theme of robotics applied to Cultural Heritage documentation is expanded and consolidated in correspondence to the international categories of UAS (Unmanned Aerial Systems), USV (Unmanned Surface Vehicles) and UUV (Unmanned Underwater Vehicles).

Drones, in the wider terms of their definition, are now used for documentation, management, protection, maintenance, and monitoring, integrating imaging systems or measuring instruments that contribute to define **three-dimensional databases** on **Cultural heritage**.

This Conference is promoted with the aim of collecting recent experiences on that topic and of providing a moment of reflection between academic and enterprise realities for the promotion of updated frameworks for the development of research in the architectural survey field.

The event will consist of three days, **16th-18th June 2022**, and it will be organized through training **workshops**, **exhibition-stands** of the main companies operating in the field of drone production and connected survey systems that will be able to realize **demonstrations** and illustrate the latest news in this field. These events will then be joined by interventions describing research activities and documentation projects conducted through the use of drones.

The Conference, will be held on **17th** and **18th, June**, with **guest speakers** and **participants** from organizations and national and international research institutes that will describe the specific research activities in the different conference sessions.

The event

The event takes place through the development of **workshops, seminars** and **conferences**, within a system of exhibitions, installations and stands dedicated to the **drones** world for **Cultural Heritage**.

During the **three days**, workshops will be organized for different levels of depth study on the development of knowledge on drone piloting practices and for the definition of **photogrammetric procedures** conducted through drone piloting.

The workshops are intended for Students, Ph.D. students, young researchers and professionals who want to better understand what are the potential of these new tools for **knowledge, detection** and **documentation activities** that can be conducted on Existing heritage.

The workshop will be held on **16th June, 2022**.

Objectives

- Defining the State of the Art in the field of survey and monitoring technologies through the use of drones;
- Evaluating the performance of drones in relation to the different documentation requirements on Existing Heritage;
- Building a network of experts in the field of Cultural Heritage documentation through the use of drones;
- Evaluating the most effective acquisition procedures and methods to develop functional models and systems for asset management;
- Considering the directions of compatibility and integration of drone data with the panorama of range-based and image-based methodological processes, pointing out strategies of interconnection;
- Analyzing the nature and definition of outputs, obtained from data integration, comparing databases and models, in terms of quality and detail, with products and information from other instruments of survey practice;
- Promote the knowledge about the law apparatus on remote piloting;
- Define research guidelines for the development of applications for the use of drones for Cultural Heritage protection.

16th June Workshop Day

The 16th June is dedicated to the realization of workshops and training seminars on the use of drones for survey.

1) DRONES PILOTING

A base piloting course is carried out. The course will cover operations of the aircraft, safety procedures and basic maneuvers to pilot. The course will be taught by an instructor from ENAC (*Italian Civil Aviation Authority*), it will not issue licenses or patents, but it will be an occasion to begin to become familiar with the tools and to understand which procedures need to be developed in order to become a SAPR pilot.

2) PHOTOGRAMMETRY BY UAV

Seminar dedicated to shooting techniques for the survey campaign project by photogrammetric acquisition using drones. Piloting and shooting practices on several case studies will be introduced and practical experiments will be developed on photographic acquisition.

3) NATIONAL AND INTERNATIONAL GUIDELINES ABOUT THE USE OF DRONES

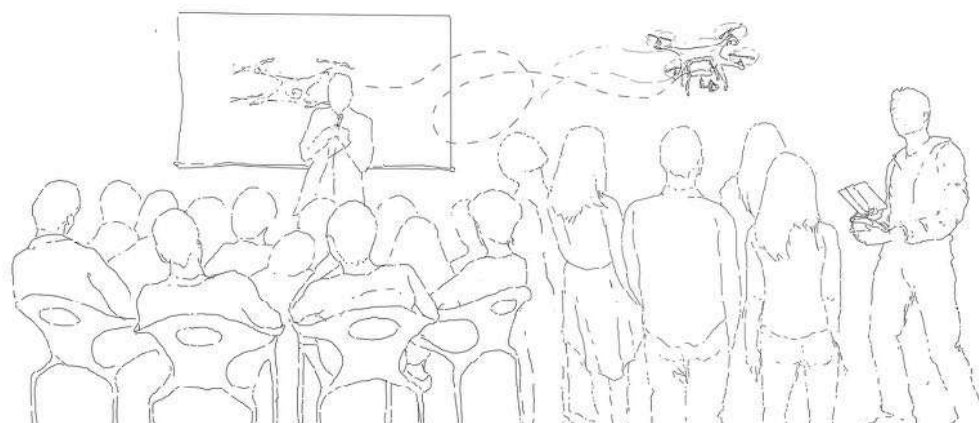
Round tables for the understanding of main contents of the legislation and law on drones at different policy scales, Global (ICAO), European (EASA) and Italian (ENAC), in order to forward proposals for revision and updating in consideration of technical and operational specifications in research and professional perspective on the use of UAVs.

17th, 18th June Conference Day

The two conference days are the main event. Speakers and international experts will be invited to illustrate the research and experiences carried out in Cultural Heritage documentation through the use of drones, in the various sessions of the conference according to the selected TOPIC.

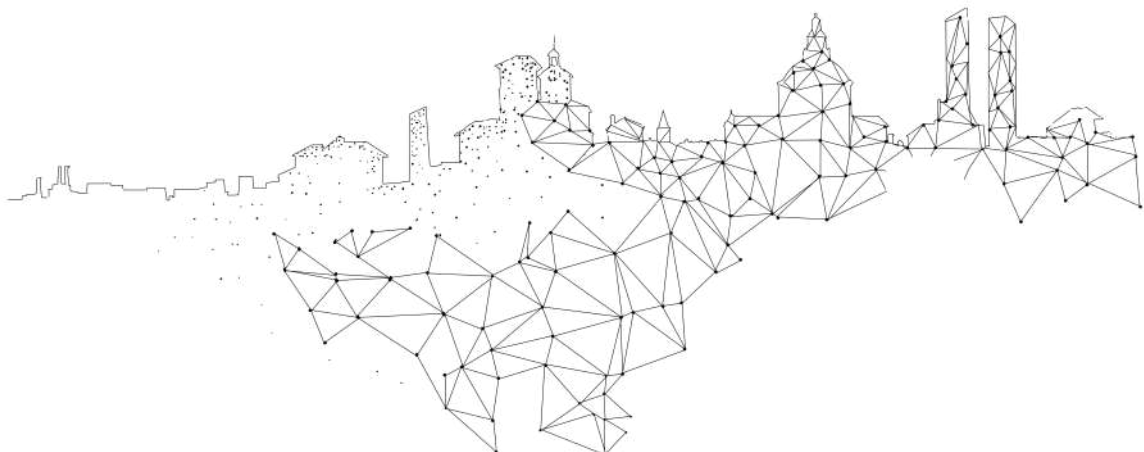
The Conference, organized in parallel sessions, includes panels of 4 or 8 interventions lasting 20 minutes each, moderated by a sector expert.

The preliminary program of the congress will be available at the end of the contributions evaluation.



Conference TOPICS

- The extensive use of UAS;
- UAVs national and international legislation;
- New approaches to fast, low-cost and open sources survey;
- Acquisition systems for critical and emergency areas inspections of sites difficult to access with UAS,
- Unmanned underwater vehicles (UUV) for remote inspection and documentation of submerged sites;
- Surface rover and USV for emergencies or Endangered Heritage: state of the art and applications;
- Unmanned Aerial Systems (UAS) for Geosciences;
- Potential and development of the use of UAS in agriculture;
- UAVs and photogrammetry for landscape and territorial aspects analysis: geological, agricultural, forestry;
- LiDAR system from UAS for the analysis of territorial aspects: geological, agricultural, forestry;
- Urban Air Quality Monitoring using UAS: sensors and future perspectives;
- UAS applications in different environments: archaeological, urban, monumental;
- 3D modelling from UAVs for the visualization, preservation and sharing of complex architectures;
- UAS to support Building Information Modeling workflows;
- SfM Procedural modeling from UAVs for the Digital Twin applications;
- Quality assessment of UAV survey.





Committees

Organizer Committees

Sandro Parrinello
Salvatore Barba

University of Pavia
University of Salerno

Scientific Committees

Marcello Balzani
José Antonio Barrera Vera
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University of Pavia - Italy

Scientific Secretariat

Anna Dell'Amico
Marco Limongiello
Silvia La Placa
Andrea di Filippo

University of Pavia
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Special Session

Call for Extended Abstract

The conference in addition to the session on Cultural Heritage provides for the organization of three thematic sessions, one more specifically aimed at the activities of geologists and all disciplines concerning Geosciences, Mechanical engineers who will deal with specific issues concerning production and construction of open drones of different nature and remote sensing and activities related to agricultural and forestry sciences.

The sessions will be coordinated by experts in each specific disciplinary sector and are open to professors, researchers and PhD students.

Session I

Geology and UAV: research, experiences and future perspectives

Chair - Prof. Francesco Zucca
University of Pavia
Department of Earth and Environmental Sciences

The use of UAV (s.l.) has grown exponentially in recent years, thanks to the simultaneous development of increasingly performing platforms and a heterogeneous range of sensors. The ability to use the potential of this mixing has made it possible to increase acquisition productivity and significantly reduce operating costs and hazards, as well as opening the door to a plethora of new applications. Geology is benefiting more than others from this favorable trend. This session is proposed to improve the level of knowledge of this context, for all disciplines concerning Geosciences (Geomorphology, Geomechanics, Geophysics, Geochemistry, Pedology, etc...) sharing state of the art experiences and research, without forgetting the future.

Session II

Aerial, Ground and Underwater Robotics for Cultural Heritage

Chairs - Prof. Lorenzo Pollini, Dr. Riccardo Costanzi
University of Pisa
Dipartimento di Ingegneria dell'Informazione

The involvement of high-technological robotic vehicles and tools modified the operational aspects of the work of many professionals. The field of Cultural Heritage is not exempt from this wide spectrum revolution. Necessities within this specific field of application drove, in the last years, part of the research and innovation. New possibilities of e.g. cost-affordable aerial imagery, 3D scanning, and underwater site exploration are fostering novel applications worldwide. The goal of this Special Session is to bring together experts of Unmanned Vehicle research, development, operations and best practice with focus on technological transfer from research institutions to vehicle integrators and end-users.

Session III

Remote Sensing in agriculture and forestry

Chairs - Prof. Gherardo Chirici

University of Florence

Dipartimento di Scienze e Tecnologie Agrarie, Alimentari Ambientali e Forestali (DAGRI)

Co Chair - Dr. Mirco Boschetti

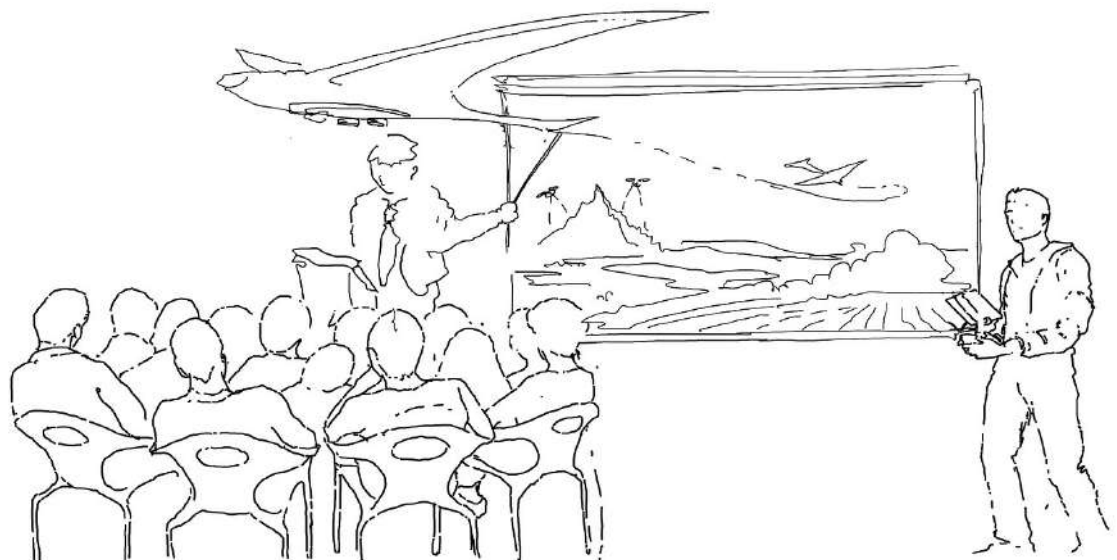
IREA-CNR

The integration of the agriculture and forestry domain into the Copernicus users community is further increasing the possibility to address the needs of this sector with new remote-sensing based services and information. The aforementioned services are also enabling dedicated platforms for the integrated management of multi-scale and multi-sensors (satellite, aerial, UAV) data and other information sources from public and private entities.

A significant acceleration has occurred in recent months due to the COVID-19 emergency, pushing further the use of Remote Sensing to minimize field activities and increase the remote exchange of data between farmers and agro-forest technicians, through dedicated digital and web applications (e.g. Regulation EU No 2020/532).

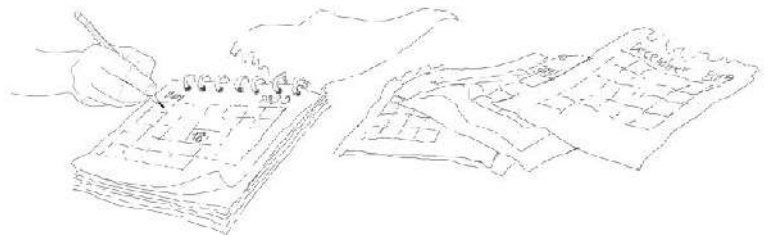
In this innovative context, spatial data and geoinformation play a key role in facilitating the “digital transformation” of the agronomic and forestry domain, providing operational services to users characterized by a higher level of accessibility, usability, and understanding.

This session will provide insights into the state of the art of Remote Sensing techniques, focusing on challenges and perspectives of the sector.



Important Dates & Procedure

CONFERENCE



It is strongly recommended to respect the dates indicated in order to facilitate the organization of the event and to guarantee the quality of the revisions. **To participate in the conference, an abstract of 500 words and an image must be sent by December 20th, 2021**, organized according to the editorial rules available online in the template section of the **submission page**, without data relating to the authors, will be sent to two anonymous reviewers chosen by the Scientific Committee.

Through careful analysis, they could accept the manuscripts, or they could reject them, evaluating the relevance of the topics presented with the issues of the conference.

The results of acceptance papers will be communicated on **January 10th, 2022**.

The full paper of the accepted contribution and the extended abstracts for Special Session, must be sent by **February 28th, 2022**, organized according to the editorial rules available in the template section of the **submission page**, without data relating to the authors, will be sent to two anonymous reviewers chosen by the Scientific Committee.

The review results will be communicated on **April 04th, 2022**.

It is mandatory to complete the registration to the event in order to be entitled to the publication of the contribution and the oral presentation during the conference.

Registrations made by **April 11th, 2022**, will benefit from a discount. Those ones made after **May 2nd 2022**, will result in the exclusion from the acts and program of the event. The list of speakers and moderators of the different sessions will be published in the days following the date of **May 17th, 2022**.

Visit the web site for more information about registration fees: www.dsiteconference.com

SPECIAL SESSION

The **Extended Abstract** must be written in English. The text must not exceed **8,000 characters** (including spaces) include bibliography, 3 keywords, and maximum of 5 copyright-free images.

The extended abstract will be published in the conference proceedings with ISBN in Pavia University Press series, "Prospettive Multiple. Studi di Ingegneria, Architettura e Arte."

The presentation of the contribution implies that it is unpublished. The authors will also guarantee that the content and images published are not copyrighted. Particular attention must be paid to recalling the sources and possible works of other authors; each quotation must be duly verified by the author. The editors reserve the right to make editorial changes that may be appropriate.

It is strongly recommended to respect the dates indicated in order to facilitate the organization of the event. Extended abstract must be sent by **February 28th, 2022**.

The review results will be communicated on **April 04th, 2022**.

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Extended Abstract Contributions will be sent by email (d.sitecongress@unipv.it), sending a .zip file containing:

1. A word text file with title, English abstract, contribution, notes, in .doc or .docx format. The text will have to contain the reference to an indicative distribution of the figures in the contribution. The Editor reserves the right to make editorial changes for the layout that may be appropriate.
2. A text file with the captions of the figures, in order and numbered, in .doc or .docx format;
3. A text file with the bibliography, in .doc or .docx format;
4. A file in .tiff format for each image. The images, in color, must have a resolution of 300 dpi and a size with a minimum base of 21 cm, saved in CYMK profile or in Black and white profile.

Please note for more information about the formatting of the paper download the editorial rules available on the online site at the submission page

EXHIBITION

To participate in the event with an exhibition, it is necessary to apply to the scientific committee through the appropriate **application format** able from the Exhibition page of the conference website. The deadline for sending the application related to the request of spaces for exhibition setups on research projects is scheduled for **January 23rd, 2022**.

Please note that a special space will be dedicated to the exhibitions in the **conference proceedings** and that the authors will be asked to write a short text describing the exhibition and the project.

The deadline for the Payment of the participation fee is **March 28th, 2022**.

WORKSHOP

To participate in the individual workshops scheduled for the day of **June 16th, 2022**, it is necessary to register by completing the format that will be able from the Registration page of the conference website. The deadline for sending registration applications is **April 04th, 2022**.

*Please note that a participation **certificate** will be released to the participants at the end of the workshop.*

Please note that there are some dates able suggested to register. Who will register by April 04th, 2022 will benefit of a reduction in the registration fee. Registration for the Workshop after the date of May 3, 2022 implies the payment of the full price.

Conference Proceedings

The accepted papers, both in the first review and at the end of additions requested by the reviewers, will be published in the **conference proceedings**.

The proceedings will collect, the catalog describing the exhibition at the Conference.



It is possible to consult the volume of the first edition 2020

"D-SITE, Drones - Systems of Information on cultural hEritage. For a spatial and social investigation ",

(edited by) Salvatore Barba, Sandro Parrinello, Marco Limongiello, and Anna Dell'Amico, published in the "Prospettive Multiple. Studi di Ingegneria, Architettura e Arte" of Pavia University Press. ISBN 978-88-6952-129-4 (OA), 978-88-6952-120-1 (paper)

The D-SITE 2020 volume is available in open access format here:

<http://www.paviauniversitypress.it/catalogo/d-site/5639>

Among the submitted contributions, some "Best Paper Awards" will be selected and will receive a certificate from the D-Site Conference.

The papers selected through **double blind peer review** will be published in the conference proceedings with **ISBN** in **Pavia University Press** series, *Prospettive Multiple. Studi di Ingegneria, Architettura e Arte*.

The awarded papers will have the possibility to be published in some journals special issue

Special journal issue



DRONES

ISSN 2504-446X

Is an international **peer-reviewed** open access. The journal focuses on design and applications of drones, including Unmanned Aerial Vehicle (UAV), Unmanned Aircraft Systems (UAS), and Remotely Piloted Aircraft Systems (RPAS), etc. Likewise, contributions based on unmanned water/underwater drones and unmanned ground vehicles are also welcomed.

The most exciting and innovative papers, related to drones and presented at the conference, will be selected to be extended and included in a Special Issue of the journal **Drones**, edited by Diego González Aguilera, Salvatore Barba and Sandro Parrinello. A guide for authors and other relevant information for submission are available on the **Instructions for Authors** page. All manuscripts will be thoroughly refereed through a **single-blind peer-review** process.

Journal issue

DISEGNARE CON



DISEGNARE CON

ISSN 1828-5961

a digital journal focused on research and feedbacks related to the Architectural Drawing field and to project communication. It is a journal intended to create an international network aimed to discuss both for stakeholders and academic researchers, in order to develop a comparison in the Construction Engineering and Architecture areas.

Among the contributions, a **selected number** will be invited by the organizing committee to present a **new extended** contribution to be submitted at the next call planned for the online journal **DISEGNARE CON**. The number will be
The unpublished paper will have to be written according to the journal editorial rules and will be subjected to a **double-blind review** process.

Exhibition

During the **event**, equipped areas will be settled, adjacent to the places of the congress and workshops, where spaces will be prepared for the exhibitions of **research projects products, posters** relating to specific papers and equipped **desks**, reserved for **companies, sponsors, laboratories** and those institutions that intend to have greater **visibility** thanks to the organization of a space in which to develop meetings and to carry out tests about products.

Research project exhibition

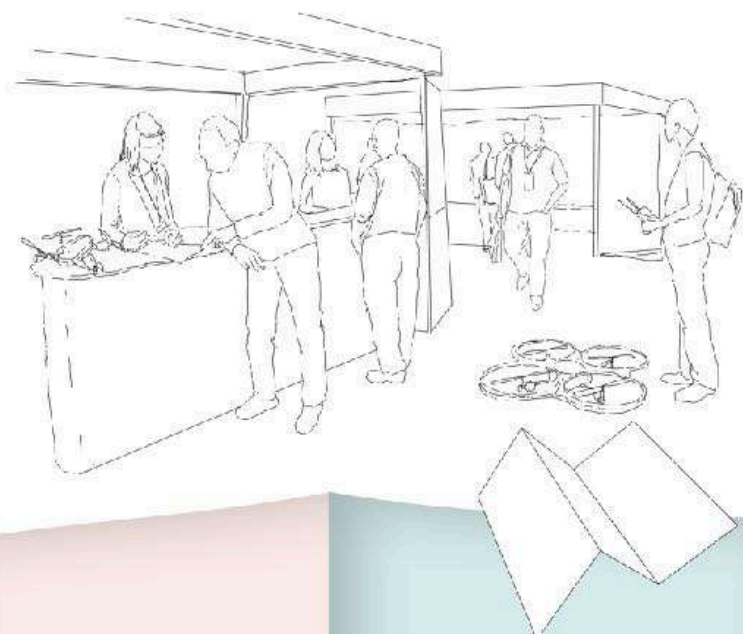
It is foreseen the possibility to present exhibitions on **research works** performed through the **use of drones, photographic campaigns, model** elaborations and what is deemed appropriate to propose evaluated by the Organizing Committee and placed in the exhibition area set up for the event.

To submit your participation proposal with an exhibition, you must **submit an abstract** that describes, in addition to an identifying title, the main topics proposed in the exhibition, which contains some illustrative images of the work and which presents an exhibition draft project following the preset available format.

Communication desk

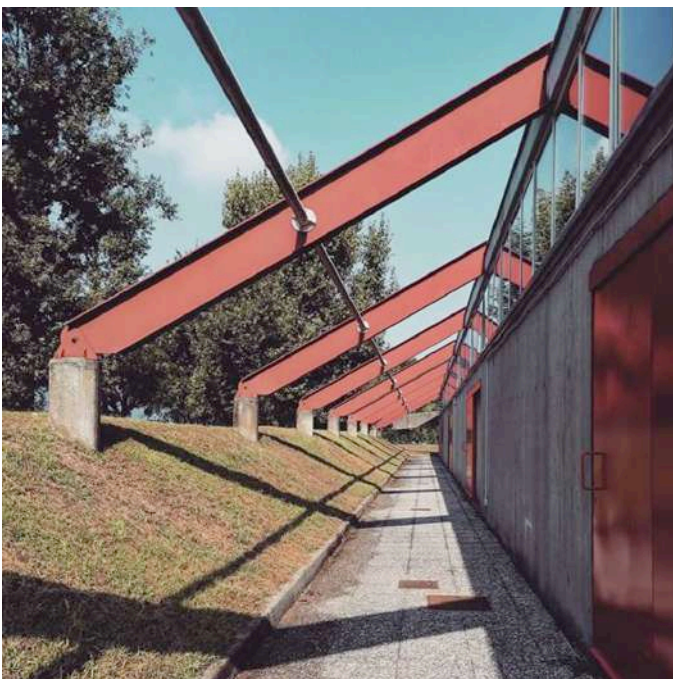
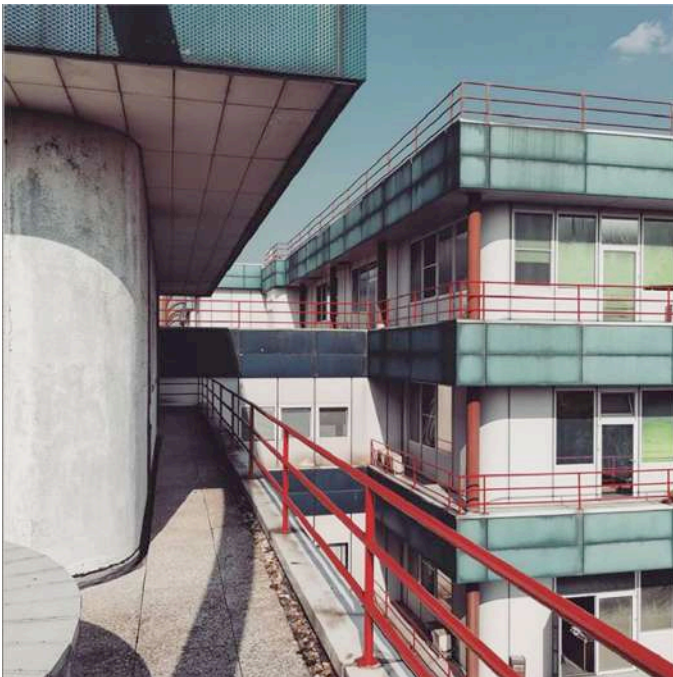
The formula envisages to foster b2b and b2c activities by **connecting** producers, retailers, users and companies that are specialized in the production of products and services related to the world of **drones for Cultural Heritage**. It is foreseen the opportunity for the companies of the sector to request a demonstration space for the entire duration of the initiative through the appropriate downloadable form in the Registration section. Requests to participate will be evaluated by the scientific committee and by the organizing secretariat of the conference.

For the purposes of the evaluation, a short abstract will be required describing the activity of the company and the reasons that lead to the participation in the event.



The conference venues

The D-SITE conference will take place at the headquarters of the Department of Civil Engineering and Architecture of University of Pavia (DICAR), in street Adolfo Ferrata, 3 (Pavia, 27100).



Contacts

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Telephone : +39 0382 98 54 32

Email : d.sitecongress@unipv.it

Website : www.dsiteconference.com



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D-SITE 2022 is organized by



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DICAR | Department of Civil Engineering and Architecture, University of Pavia

in collaboration with :



DAda-LAB
 Drawing Architecture
 Document-Action Laboratory



PLAY
 Photography and 3D Laser for virtual Architecture Laboratory



LS3D- Joint Laboratory
 Landscape, Survey & Design



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DICIV | Department of Civil Engineering, University of Salerno



Laboratorio Modelli,
 Surveying and Geo-Mapping for Environment and Cultural Heritage

In collaboration with:



Patronage



Official Partners



Media Partners



drones

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