International Workshop
Computational Dynamic Soil-Structure Interaction (CompDSSI)
11-13 September 2024

Motivation and goal

Advances in the field of soil-structure interaction are impacting design, retrofitting and protection of civil engineering structures against natural hazards. CompDSSI is an in-person International Workshop devoted to new-generation numerical approaches for the dynamic analysis of soil-structure systems of strong practical relevance, investigating critical issues and high-fidelity methods applicable from local to regional scale.

A meeting point to share knowledge, in which researchers and designers of Structural & Geotechnical Engineering will promote solutions for a safer and more efficient urban fabric. The co-presence of Academia and Industry is a key element of CompDSSI, for better orienting new lines of research and implementing them in real cases.

CompDSSI takes place over two and a half days. It is composed of five sessions in which high impact subjects are largely discussed in a purposeful and heterogeneous environment. Each session is made up of a Keynote Lecture and oral presentations.

Organising committee

Dr. Davide Noè Gorini
Sapienza University of Rome, Italy

Prof. Pedro Arduino
University of Washington, US

Dr. Domenico Gallese
ARUP, UK

Scientific committee

Prof. Anastasios Sextos (University of Bristol, UK), **Prof. Shideh Dashti** (University of Colorado at Boulder, US), **Prof. Guido Camata** (University of Pescara G. d'Annunzio, Italy), **Prof. Christopher McGann** (University of Canterbury, New Zealand), **Prof. Francesca Dezi** (University of Camerino, Italy), **Prof. Nikos Gerolymos** (National Technical University of Athens, Greece), **Dr. Federico Pisanò** (Norwegian Geotechnical Institute, US), **Prof. Ertugrul Taciroglu** (University of California, Los Angeles, US), **Prof. Claudio Tamagnini** (University of Perugia, Italy), **Prof. José A. Abell** (University of the Andes, Chile), **Prof. Stefania Sica** (University of Sannio, Italy), **Prof. James Ricles** (University of Lehigh, US), **Prof. Domniki Asimaki** (California Institute of Technology, US), **Prof. Paolo Franchin** (Sapienza University of Rome, Italy), **Dr. Yu-Wei Hwang** (National Yang Ming Chiao Tung University, Taiwan), **Dr. Massimo Petracca** (ASDEA Software Technology, Italy), **Prof. Stavroula Kontoe** (University of Patras, Greece), **Prof. Youssef M. A. Hashash** (University of Illinois Urbana-Champaign, US), **Prof. Boris Jeremic** (University of California, Davis, US), **Dr. Domenico Gallese** (ARUP, UK), **Prof. Pedro Arduino** (University of Washington, US), **Dr. Davide Noè Gorini** (Sapienza University of Rome, Italy)

Keynote Speakers

Session 1 - Large soil-structure systems: from advanced modelling to novel practice-oriented approaches

Dr. David McCallen
Lawrence Berkeley National Laboratory, United States

"Applications of emerging GPU-accelerated computing at the exascale – exploration of fault-to-structure simulations with regional-scale 3D physics-based models"

Session 2 - Artificial Intelligence-based approaches to dynamic soil-structure interaction

Prof. Ertugrul Taciroglu
University of California Los Angeles, United States

"Region-Scale Seismic Simulations and Opportunities to Exploit their Output through Machine Learning Techniques"

Session 3 - Mitigation of natural hazards in urban settings and optimised design of protection solutions

Prof. Shideh Dashti
University of Colorado at Boulder, United States

"Mitigation of seismic liquefaction in urban and stratigraphically-variable environments"

Session 4 - Offshore infrastructures under complex loading

Dr. Federico Pisanò
Norwegian Geotechnical Institute, United States

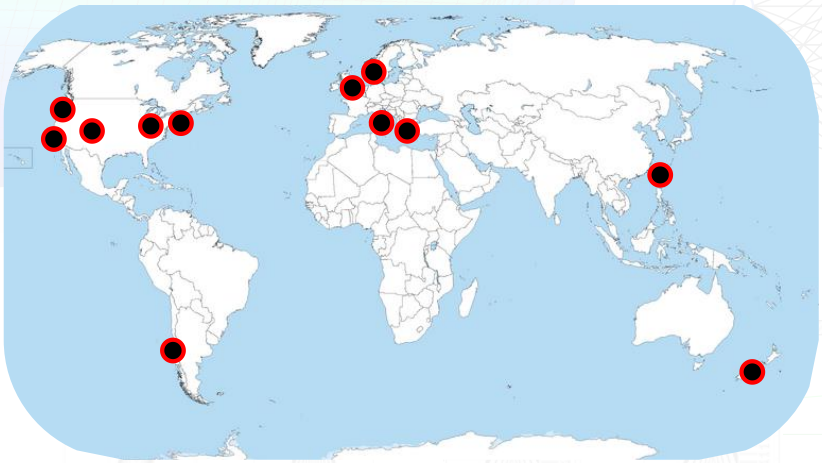
"Recent trends and gaps in the numerical analysis of offshore foundations under environmental loads"

Session 5 - Underground structures, and their interaction with the urban fabric

Prof. Daniela Boldini
Sapienza University of Rome, Italy

"The role of numerical and constitutive modelling in the seismic design and retrofitting of tunnels"

Geographical affiliations (red circles) of the Scientific Committee and Keynote Speakers



With the support of

- Technical Committee 203 *Earthquake Geotechnical Engineering and Associated Problems* of the International Society for Soil Mechanics and Geotechnical Engineering (website)
- Technical Committee 204 *Geotechnical Aspects of Underground Construction in Soft Ground* of the International Society for Soil Mechanics and Geotechnical Engineering (website)
- Technical Committee 209 *Offshore Geotechnics* of the International Society for Soil Mechanics and Geotechnical Engineering (website)
- Technical Committee 309 *Machine Learning and Big Data* of the International Society for Soil Mechanics and Geotechnical Engineering (website)

- ASDEA Software Technology (website)

- NHERI SimCenter – Center for Computation Modeling & Simulation (website)

- Associazione Geotecnica Italiana (website)

- DESIGNSAFE-CI (website)

- Associazione Nazionale Italiana di Ingegneria Sismica (website)

- NHERI Lehigh Facility (website)

- Advanced Technology for Large Structural Systems Engineering Research Center (website)

Abstract submission

One-page abstracts (no figures/references required at this stage) are invited by April 30, 2024 and Authors will be informed of acceptance by June 15, 2024. Extended versions of the accepted abstracts (3 pages, including figures and references) will be required by July 30, 2024. All accepted contributions will be presented during the Workshop's days.

Abstracts should be prepared in MS Word (.doc) and Adobe Acrobat (.pdf) formats, according to the template at this ***link***. Both .doc and .pdf files should be sent via email to compdssi2024@gmail.com with a copy to davideno.gorini@uniroma1.it.

There will be no formal proceedings of the Workshop. All extended abstracts will be included in the publication "Computational Dynamic Soil-Structure Interaction - CompDSSI, Assisi, Italy, Sep 11-13, 2024 – Book of Extended Abstracts", which will be available free to download from the ***Workshop website***.

Venue and accomodation

CompDSSI will be held at Hotel Domus Pacis (https://domuspacis.it/), which has a privileged location in the heart of Umbria (centre of Italy). It is located 900 m from Assisi railway station S. Maria degli Angeli and 3 kilometres from the famous historical town of Assisi, which can be reached by shuttle bus or via a 30-minute walk.

Hotel Domus Pacis provides full board service at € 88 or 73 per day for the single or shared room, respectively. People interested in reserving a room at Hotel Domus Pacis are kindly invited communicate it to compdssi2024@gmail.com, with a copy to davideno.gorini@uniroma1.it (please, consider that rooms are subject to availability).

An additional fee will be required to people not staying at Hotel Domus Pacis to take part in the lunches/dinners (€ 25 per meal) during the Workshop's Days.

How to get to Assisi

By plane

The closest major airports to Assisi are: Umbria International Airport S. Francesco d'Assisi (Perugia), Peretola Airport (Florence), Fiumicino Airport Leonardo da Vinci (Rome), Galileo Galilei Airport (Pisa). All these airports are roughly the same distance away, but the transport links from Rome and Florence (via train) will be the easiest.

By train

Assisi railway station is located in S. Maria degli Angeli, from which Hotel Domus Pacis can be straightforwardly reached on foot or via a local bus service (line C) running from outside the railway station.

Ticket Office Hours: 1:00 p.m. to 7:35 p.m.

Website of the Italian Railways (FS): http://www.trenitalia.com/

By car

Coming from the North

a) Highway 14 – Autostrada Adriatica: exit at Cesena (150 km from Assisi) and continue to Perugia (E45) until Assisi exit.

b) Highway Autostrada del Sole A1: Exit Valdichiana until you reach Perugia, continue towards Cesena (E45) until Assisi exit.

Coming from the South

a) Highway 14 – Autostrada Adriatica: exit Civitanova Marche towards Foligno – Perugia until the Assisi exit.

b) Highway Autostrada del Sole A1: exit Orte, continue on the E45 towards Perugia – Cesena until the Assisi exit.

By bus

Bus service: Bus Italia, website http://www.fsbusitalia.it, office phone +39.075 9637637, e-mail clienti.perugia@fsbusitalia.it

Registration and fees

Registration to the Workshop is mandatory through this ***form***. The payment of the fees can be made after the acceptance of registration and, however, within the period April 15-July 31 through bank transfer (bank coordinates are communicated upon acceptance). Fees include Workshop attendance, coffee breaks and the submission of one paper.

Workshop fees

payment	Delegate	Student
by June 30, 2024	350 euros	280 euros
from July 1 on	410 euros	330 euros

Scientific programme (tentative)

Day 1 - Wednesday, September 11

14.00-15.00 **Registration**

14.45-15.15 **Opening**

Session 1 – Large soil-structure systems: from advanced modelling to novel practice-oriented approaches

The goal is to explore new trends in the analysis of civil engineering structures profoundly interacting with soil under dynamic loading. The focus is on advanced modelling of large soil-structure systems as well as on novel approaches for practical purposes. Studies promoting the connection of practice-oriented analysis tools to advanced numerical frameworks for structural analysis under different/combined natural hazards are also welcome. The scale of interest is from the one of the single infrastructure to regional assessment.

15.15-16.00 **Keynote lecture:** *David McCallen* (30 mins + 15 mins for Q&A)

16.00-17.00 Presentation of the selected contributions (at least 15 mins + 5 mins for Q&A per lecture)

17.00-17.45 Coffee break

17.45-18.45 Presentation of the selected contributions (at least 15 mins + 5 mins for Q&A per lecture)

20.15 Dinner

Day 2 - Thursday, September 12

Session 2 – Artificial Intelligence-based approaches to dynamic soil-structure interaction

Artificial Intelligence is becoming increasingly popular as a powerful approach to face soil-structure interaction problems and the relative uncertainties. The use of AI through different frameworks, from machine learning to neural networks, to manage big data and make systematic predictions of dynamic soil-structure interaction is the key point of this session. Also, emerging methods on how mechanistic modelling can be combined with AI-based approaches is part of the discussion.

9.00-9.45 **Keynote lecture:** *Ertugrul Taciroglu* (30 mins + 15 mins for Q&A)

9.45-10.45 Presentation of the selected contributions (at least 15 mins + 5 mins for Q&A per lecture)

10.45-11.30 Coffee break

11.30-13.10 Presentation of the selected contributions (at least 15 mins + 5 mins for Q&A per lecture)

13.10-14.30 Lunch

Session 3 – Mitigation of natural hazards in urban settings and optimised design of protection solutions

In this session, soil-structure interaction is regarded as an opportunity to design safer and more sustainable structures against natural hazards. Room is dedicated to the conception, numerical assessment and validation of protection solutions for foundation systems or having a close

interaction with soil. Studies highlighting the practical implications of mitigation techniques are encouraged, as well as procedures for the optimized design of hazard resistant systems.

14.30-15.15 **Keynote lecture:** *Shideh Dashti* (30 mins + 15 mins for Q&A)

15.15-16.15 Presentation of the selected contributions (at least 15 mins + 5 mins for Q&A per lecture)

16.15-17.00 Coffee break

17.00-18.40 Presentation of the selected contributions (at least 15 mins + 5 mins for Q&A per lecture)

20.15 Dinner

Day 3 - Friday, September 13

Session 4 – Offshore infrastructures under complex loading

Offshore infrastructures constitute an important means for renewable energy, harvesting resources and creating available spaces for human life. Driven by their rapid development over the last decades, this session aims to discuss new-generation numerical techniques for assessment and design of offshore soil-infrastructure systems under complex dynamic loads, e.g., multi-hazard phenomena and soil-fluid-structure interaction. Of particular interest is the analysis through reduced-order models, how the latter can be used to face real cases and bridge the gap between research and design.

9.15-10.00 **Keynote lecture:** *Federico Pisanò* (30 mins + 15 mins for Q&A)

10.00-11.00 Presentation of the selected contributions (at least 15 mins + 5 mins for Q&A per lecture)

11.00-11.30 Coffee break

11.30-13.10 Presentation of the selected contributions (at least 15 mins + 5 mins for Q&A per lecture)

13.10-14.30 Lunch

Session 5 – Underground structures, and interaction with the urban fabric

Shallow tunnels, buried pipelines, underground stations and parking are some of the structural typologies that will be discussed, as systems undergoing an increasing development for their efficient use of the underground space. This session aims to investigate the dynamic performance of these structural typologies, the interaction mechanisms occurring between underground and above-ground structures under natural hazards, as well as practice-oriented numerical procedures coping with these problems and their application to real case studies.

14.30-15.15 **Keynote lecture:** *Daniela Boldini* (30 mins + 15 mins for Q&A)

15.15-16.15 Presentation of the selected contributions (at least 15 mins + 5 mins for Q&A per lecture)

16.15-17.00 Coffee break

17.00-18.40 Presentation of the selected contributions (at least 15 mins + 5 mins for Q&A per lecture)

18.40-19.00 **Closing**