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**PROCEEDINGS OF THE 4TH
INTERNATIONAL CONFERENCE ON CIVIL,
STRUCTURAL AND TRANSPORTATION
ENGINEERING (ICCSTE'19)**

June 11 - 12, 2019 | Ottawa, Canada

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WELCOME MESSAGE FROM THE CONFERENCE CHAIR

On behalf of the International Academy of Science, Engineering and Technology (International ASET Inc.), the organizing committee would like to welcome you to the 4th International Conference on Civil, Structural and Transportation Engineering (ICCSTE'19).

ICCSTE'19 is aimed to become one of the leading international annual conferences in the fields related to civil, structural, and transportation engineering. This conference will provide excellent opportunities to the scientists, researchers, industrial engineers, and university students to present their research achievements and to develop new collaborations and partnerships with experts in the field.

ICCSTE is a series of international conferences which are held yearly. These conferences focus on all aspects of civil, structural, and transportation engineering. After the success of the third conference in Canada, ICCSTE will remain in Canada and will host the fourth international conference.

In the fourth meeting of this conference, two keynote speakers will share their expertise with the aim of exposing participants to a wide spectrum of applications, and to foster crosspollination of ideas and develop new research interests. In addition, approximately 25 papers will be presented from professors, students, and researchers across the world.

We thank you for your participation and contribution to the 4th International Conference of Civil, Structural and Transportation Engineering (ICCSTE'19). We wish you a very successful and enjoyable experience.

Dr. Sai K. Vanapalli

*Conference Chair and Proceedings Editor
ICCSTE'19*

ABOUT ICCSTE'19

The 4th International Conference on Civil, Structural and Transportation Engineering (ICCSTE'19) aims to become the leading annual conference in fields related to civil, structural and transportation engineering. The goal of ICCSTE'19 is to gather scholars from all over the world to present advances in the fields of civil, structural and transportation engineering and to foster an environment conducive to exchanging ideas and information. This conference will also provide an ideal environment to develop new collaborations and meet experts on the fundamentals, applications, and products of the mentioned fields.

ICCSTE is a series of international conferences held yearly. These conferences focus on all aspects of civil, structural and transportation engineering. After successfully holding ICCSTE'16 to ICCSTE'18 in Canada, ICCSTE'19 is hosted in Canada as well this year.

ICCSTE is an acronym for **I**nternational **C**onference on **C**ivil, **S**tructural and **T**ransportation **E**ngineering.

- The proceedings is published in Ottawa, Canada.
- All papers were peer-reviewed
- The congress proceedings is published under an ISSN and ISBN number
- Each paper is assigned a unique DOI number by [Crossref](#)
- The conference proceedings is indexed by [Scopus](#) and [Google Scholar](#)
- The proceedings is permanently archived in [Portico](#) (one of the largest community-supported digital archives in the world)

 Google Scholar

 Crossref

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SCIENTIFIC COMMITTEE

We would like to thank the following for accepting to act as a member of the Scientific Committee for the ICCSTE'19 Congress:

Scientific Committee Chairs



Dr. Sai K. Vanapalli
University of Ottawa

Scientific Committee Members

- **Dr. Francis Au**, University of Hong Kong, Hong Kong
- **Dr. Ashutosh Bagchi**, Concordia University, Canada
- **Dr. Sunanda Dissanayake**, Kansas State University, USA
- **Dr. Massimo Fragiaco**, University of L'Aquila, Italy
- **Dr. Christoph Gehlen**, Technische Universität München, Germany
- **Dr. Jianwei Huang**, Southern Illinois University Edwardsville, United States
- **Dr. Alireza Keshavarzy**, Western Sydney University, Australia
- **Dr. Mohamed Lachemi**, Ryerson University, Canada
- **Dr. Ramli Nazir**, Universiti Teknologi Malaysia, Malaysia
- **Dr. Van-Thanh-Van Nguyen**, McGill University, Canada
- **Dr. Gianluca Ranzi**, University of Sydney, Australia
- **Dr. Yuri Yevdokimov**, University of New Brunswick, Canada
- **Dr. Yong Sheng**, University of Wolverhampton, UK

KEYNOTE SPEAKERS

The keynote information for the 4th International Conference on Civil, Structural and Transportation Engineering (ICCSTE'19) is as follows:



[Dr. Giovanni Grasselli](#)
University of Toronto, Canada



[Dr. Magdi Mohareb](#)
University of Ottawa, Canada

ICCSTE'19 KEYNOTE SPEAKERS



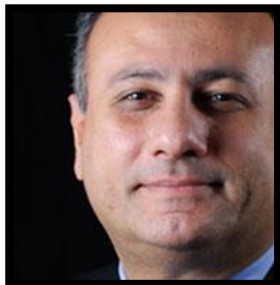
Titles: Advanced Numerical Modeling in Engineering
- FDEM: A MicroMechanical Approach that Bridges
Across Scales

Dr. Giovanni Grasselli, University of Toronto,
Canada

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Giovanni Grasselli is Professor and NSERC/Energi Simulation Research Chair in Fundamental Rock Physics and Rock Mechanics at the University of Toronto. His research focuses on hybrid finite-discrete element (FDEM) numerical technology, experimental geomechanics applied to the study of tunneling and hydraulic fracturing. He received the prestigious ISRM Rocha Medal (2004) for best thesis worldwide in rock mechanics and supervised two Rocha Medal winner (2015 and 2017). Through the start-up company Geomechanica Inc., the FDEM technology is currently commercialized and translated to engineering practice.



Titles: Lessons learned from Recent Lateral
Torsional Buckling Research

Dr. Magdi Mohareb, University of Ottawa, Canada

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Dr. Magdi Mohareb is a professor of structural engineering at the University of Ottawa. His research interests involve buckling problems in structural steel and pipelines. A significant part of his work over the past 20 years centred on developing innovative analysis, design, and strengthening solutions for lateral torsional buckling problems in structural steel, timber, and composites.

Dr. Mohareb received a Bachelor in Civil Engineering from Cairo University, Egypt in (1986), a MASc in Structural Engineering from Texas Tech University (1990) and a PhD from the University of Alberta in (1995). He is registered as a professional engineer in Alberta and Ontario. Before joining academia in 2000, he worked for several years as a structural engineer and was involved in designing and upgrading industrial structures.

LIST OF PAPERS

The following papers were presented at the 4th International Conference on Civil, Structural and Transportation Engineering (ICCSTE'19)

Geotechnical Engineering

[GIS-based Modeling of Debris Flow Runout Susceptibility in Kulekhani Watershed, Nepal](#)

Authors: Bhuwani Paudel, Mamadou Fall, Bahram Daneshfar

[Effect of calcium enriched waste on physiochemical properties of stabilized subgrade soil](#)

Authors: Amit Kumar, Dharmender Kumar Soni

Green Building Materials and Technology

[Performance of ecological cement-based composites containing sugarcane bagasse ash – A review](#)

Authors: Marco Antonio Maldonado-García, Pedro Montes-García, Pedro Leobardo Valdez-Tamez

[An overview of the performance of untreated fly ash and fine glass powder for ecological preparation of ternary concretes](#)

Authors: Alejandra Verónica Pacheco-Hernández, Marco Antonio Maldonado-García, Víctor Guillermo Jiménez-Quero

[Low-cost Housing Using Sustainable Materials and Catenary Shapes](#)

Authors: Mitchell Gohnert

[Appraisal of hybrid fiber reinforced ECC](#)

Authors: Maninder Singh, Babita Saini, H.D. Chalak

LIST OF PAPERS

New Technologies, Methods and Techniques in Civil Engineering

[Pipe Replacement Assessment prior to Leakage in Urban Areas Using Big Data Analytics](#)

Authors: Manatsawee Nawik, Kanjana Sirapongpaioj, Pathomphong Phannurat

[Implementing Viscous Plane Damper to Prevent Pounding Between Adjacent Reinforced Concrete Buildings](#)

Author: Asal Ameen Taha, Farzad Hejazi

[Structural Health Monitoring Optimization For Similar Structures Using A Hierarchical Bayesian Update](#)

Authors: Christelle Geara, Rafic Faddoul, Alaa Chateaneuf, Wassim Raphael

[Automatization of the Constructive Process: a Systematic Study of the 3D Concrete Printing Technology \(Contour Crafting\)](#)

Authors: Amarildo Verginio Moreira Jr., Francielle Coelho dos Santos

[Bayesian update of the residual life of a concrete structure using inspection data](#)

Authors: Gaowei Xu, Viliam Makis

[Comparative insight on building code paradigm shift practice and updates: International perspectives](#)

Authors: Amarachukwu Nwadike, Suzanne Wilkinson, Charles Clifton

[The Effect of Temperature and Moisture Variation on the Heat Transfer Through Building Envelope](#)

Authors: Maatouk Khoukhi, Ahmed Hassan, Shaimaa Abdelbaqi

LIST OF PAPERS

Poster Session

[Optical fibre bending sensor for vehicle weight detection](#)

Authors: Jan Jargus, Stanislav Kepak, Jakub Cubik, David Bujdos, Martin Stolarik

[Fiber interferometric system for vehicle monitoring near railway level crossings](#)

Authors: Stanislav Kepak, Jakub Cubik, David Hruby, Vladimir Vasinek

[Optical fibres integrated in structure as a safety element for pedestrians](#)

Authors: Jakub Cubik, Stanislav Kepak, Marcel Fajkus, Radek Marik, Vladimir Vasinek

[Distributed fibre-optic technology for security monitoring of a structural load of road and motorway tunnels](#)

Authors: David Hruby, Jakub Cubik, Stanislav Kepak, Stanislav Zabka, Pavel Mec, Vladimir Vasinek

[Multileaf Spring Model and Its Behaviour in a Tandem Bogie Layout](#)

Authors: Martin Maloch, Stefan Cornak

Environmental Sustainability and Development

[Kabul City Groundwater and Need for Artificial Recharge](#)

Authors: Khwaja Mohammad Ashraf Noori, Mohammad Nasim Nasimi

SPONSORS

International ASET Inc. would like to thank the following sponsors for their support of ICCSTE'19:



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JOURNAL PUBLICATION

Selected articles from the conference will be published in the [International Journal of Civil Infrastructure \(IJCI\)](#) after a secondary review process.

The publication fee will be waived for papers that win the best paper award. Other attendees will receive a 25% discount towards the publication fee of the journal.

This journal has adopted to the open-access model, meaning all free access to the journal's articles and content with no need for subscription. This ensures larger audience and therefore higher citations.

Users are allowed to read, download, copy, distribute, print, search, or link to the full texts of the articles in this journal without asking prior permission from the publisher or the author. This is in accordance with the BOAI definition of open access.

All published papers of IJCI will be submitted to Google Scholar, Microsoft Academic Search, Open J-Gate, Mendeley, Index Copernicus International, Academic Index, Mendeley, Primo Central, and Genomics JournalSeek for possible indexing. Additionally, they will be permanently archived in Portico (one of the largest community-supported digital archives in the world) and will be assigned unique DOIs.

ETHICS & MALPRACTICE

At International ASET Inc., we take matters that relate to ethics in publishing very seriously. We believe that the peer-review publication process is a vital building block of academia, and its integrity must be maintained at all costs, which is why every article will be peer-reviewed by several experts in the field. Under peer-review, experts in the related fields are required to provide opinions and comments on the improvements of the submissions.

We are pleased to announce that Avestia Publishing (a publisher of International ASET Inc.) has been approved by the [Committee on Publication Ethics \(COPE\)](#). We are proud of our efforts towards abiding by the guidelines of ethics, integrity, and high standards in publishing.

Following are the ethics guidelines set by the organizers for the authors and the reviewers of the conference:

Scientific Committees

Scientific committees consisting of experts in the fields are established. The committees oversee the peer-review and publication process. To see the scientific committee members, please follow the link: [Scientific Committee](#)

Equality and Decisions

One or more reviewer, scientific committee member, or chair, (internal or external), are responsible for evaluating the relevance of the submitted manuscripts to the proceedings, technical and scientific merit, originally, and impact. These evaluations are to be carried out regardless of ethnicity, religion, gender, sexual orientation, political beliefs, and institutions. Successive to peer-review, the Chair has full authority and is solely responsible for the published content and the process thereof.

Confidentiality

Scientific committee member(s) and publishing staff may not disclose manuscripts or their content, directly or indirectly, to anyone other than individuals invited to review the manuscript (whether they accept or not), other reviewers of the same publications, and publishing staff.

Conflicts of Interest

Scientific committee member(s) and publishing staff may not utilize the contents of submitted manuscripts whether accepted or rejected, directly or indirectly for their own research purposes without prior written consent by the authors.

ETHICS & MALPRACTICE

Reviewers

Contribution to Decisions

In order for final decisions to be made regarding acceptance or rejection of papers, we rely on peer-review. Peer-review is the process of experts in the field reading, understanding, and objectively commenting on submitted papers. Through peer-review, scholars give back to the academic and scientific community by helping the chair(s) make decisions regarding manuscripts.

Promptness

Reviewers should promptly notify the chair(s) if they are unable or unqualified to carry out their reviewing duties. Reviewers should do their best to provide the reviews to the chair(s) as promptly as possible, and within the designated time-frame.

Acknowledgment of Source

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Reviewers must not share the contents of the manuscripts they receive for review, regardless of their decision to review or contents of the review, directly or indirectly, with anyone other than the person who has assigned the review.

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Reviewers should review manuscripts fairly and objectively, with supporting evidence or arguments, regardless of personal feelings or biases.

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Invited reviewers should immediately inform the chair(s) in case of a conflict of interest based on competitive, collaborative, personal, family, and other relationships with the authors or people involved in the work.

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Authors

Reporting Standards

The paper being submitted for the proceedings should be based on clear objective, discussion, and references. The findings, data, and the arguments being used in the paper should be accurate. It is author's responsibility to guarantee the authenticity of the data in the paper.

Authorship

Only persons who have significantly contributed to the work and the manuscript can be named authors on a paper. These contributions include the idea/concept, design, experiments, evaluation, analysis, drafting or revision of the manuscript, and others. Authors must all have agreed to be named as such and for the manuscript to be submitted. Anyone who has contributed based on the above, but the level of contribution is not significant, may appear in the acknowledgement section of the manuscript.

Acknowledgement of Source

Acknowledgement to other's work being used in the paper must be given at all times. Authors of the paper should give comprehensive credit where it is necessary, by citing the work, they use for supporting their own research.

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Authors should describe their work and the results of their work accurately and in full. The level of provided accuracy and detail should be such that a reader can replicate the work independently. Inaccurate, incomplete, fraudulent, and misleading statements are considered unacceptable and unethical. Direct or indirect use of other people's work is not allowed, unless properly cited. Previous works that have influenced the current work should also be cited. Presenting someone else's work as one's own is strictly prohibited and is considered plagiarism.

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Hazardous Material

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Unethical/plagiarism issues mostly result in a retraction, while unintended mistakes will mostly result in the publication of an erratum.

ETHICS & MALPRACTICE

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Schedule:

This conference proceeding accompanies the conference, meaning a new proceedings will be published every year for the corresponding annual conference of this series.

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