



8th and 9th April 2021

- GMT+1 Time (London, Lisbon) -

LIVE EVENT

PROGRAMME

PRELIMINARY_v4

Introduction to the Programme of the SIM 2021

Dear Colleagues,

It is with great pleasure that we welcome you to the First International Congress on Structural Integrity and Maintenance – SIM 2021. The first edition of the SIM 2021 congress gathers more than 90 participants from more than 10 nationalities, demonstrating the diversity of this new event. At this moment, the SIM 2021 1st edition will occur in a virtual format (April 08th and 09th, 2021) due to disorders caused by the pandemic COVID-19 situation. Hopefully, the conference 2nd edition will take place in person on 5 and 6 October 2021, in Belo Horizonte/Brazil.

The International Congress on Structural Integrity and Maintenance (SIM 2021) is organized by Federal University of Minas Gerais (UFMG, Brazil), Institute for R&D in Structures and Construction (CONSTRUCT, FEUP, Portugal) and University of São Paulo (USP, Brazil). The purpose of this conference is to bring together academic researchers and scholars, as well as engineers from the construction sector to exchange and share their innovative research results and practical experiences on all aspects of Structural Integrity, Design and Maintenance. Then, the participants will have the opportunity to view and share the recent advances related to the following themes: structural integrity, fatigue, fracture, damage mechanics, structural design, advanced construction materials, design of all civil engineering structures types, building information modelling (BIM), artificial intelligence applied to design, safety and risk analysis, structural retrofit and maintenance, probabilistic assessment of structures, management and life-cycle performance, and construction sector management. This event also covers subjects related to computational and numerical modelling of a wide range of infrastructures, such as engineer technical systems, transportation systems, bridges, buildings, dams, railways, underground constructions, wind and transmission towers, offshore platforms, pipelines, naval vessels and ocean structures. It is expected contributions from engineers, metallurgists, material scientists, and other professionals, allowing a significant multidisciplinary discussion.

The Organizing Committee of the SIM 2021 immensely acknowledges all members of the Advisory and Scientific Committees for their conference support, the Plenary Speakers and Sessions Chairmen for their knowledge and dedication, all the authors that contributed to the success of the event with their great presentations, and the sponsors for their important contributions. Finally, a word of appreciation for the Organizing Committee members as well as students and other UFMG/USP/FEUP staff for their tireless support.

The chair of the International Congress on Structural Integrity and Maintenance Proceedings - SIM 2021 (Book of Abstracts),

Hermes Carvalho

Sessions at a Glance

Day	Session / Keynotes		Session Chair(s)
Thursday, April 8 th 2021 13h00 - 14h00 (GMT+1) / 09h00 - 10h00 (BrazilTime)	PS1	<i>Shun-Peng Zhu</i>	<i>José A.F.O. Correia</i>
Thursday, April 8 th 2021 17h00 - 18h00 (GMT+1) / 13h00 - 14h00 (BrazilTime)	PS2	<i>Nicholas Fantuzzi</i>	<i>Grzegorz Lesiuk</i>
Friday, April 9 th 2021 13h00 - 14h00 (GMT+1) / 09h00 - 10h00 (BrazilTime)	PS3	<i>Rui Calçada</i>	<i>Shun-Peng Zhu</i>
Friday, April 9 th 2021 17h00 - 18h00 (GMT+1) / 13h00 - 14h00 (BrazilTime)	PS4	<i>Grzegorz Lesiuk</i>	<i>Ricardo Branco</i>
Thursday, April 8 th 2021 14h00 - 16h00 (GMT+1) / 10h00 - 12h00 (BrazilTime)	A1 – Renewable Energy Structures		<i>Tiago Ferradosa (Portugal)</i> <i>Nicholas Fantuzzi (Italy)</i>
Thursday, April 8 th 2021 14h00 - 16h00 (GMT+1) / 10h00 - 12h00 (BrazilTime)	A2 – Structural Integrity and Fatigue		<i>José A.F.O. Correia (Portugal)</i> <i>Shun-Peng Zhu (China)</i>
Thursday, April 8 th 2021 18h00 - 20h00 (GMT+1) / 14h00 - 16h00 (BrazilTime)	A3 – Steel and Composite Structures		<i>Hermes Carvalho (Brazil)</i> <i>Hermano Cardoso (Portugal)</i>
Thursday, April 8 th 2021 18h00 - 20h00 (GMT+1) / 14h00 - 16h00 (BrazilTime)	A4 – Safety Assessment, Maintenance, Retrofit and Strengthening of Structures / Structural Integrity		<i>Diogo Ribeiro (Portugal)</i> <i>J.G. Santos da Silva (Brazil)</i>
Friday, April 9 th 2021 14h00 - 16h00 (GMT+1) / 10h00 - 12h00 (BrazilTime)	A5 – Steel, Composite and Concrete Structures		<i>João Paulo Rodrigues (Portugal)</i> <i>Rodrigo Caldas (Brazil)</i>
Friday, April 9 th 2021 14h00 - 16h00 (GMT+1) / 10h00 - 12h00 (BrazilTime)	A6 – Structural Integrity and Fatigue		<i>Abílio M.P. De Jesus (Portugal)</i> <i>Dariusz Rozumek (Poland)</i>
Friday, April 9 th 2021 18h00 - 20h00 (GMT+1) / 14h00 - 16h00 (BrazilTime)	A7 – New Materials and Advanced Computational Methods		<i>Ricardo Branco (Portugal)</i> <i>Lapo Gori (Brazil)</i>
Friday, April 9 th 2021 18h00 - 20h00 (GMT+1) / 14h00 - 16h00 (BrazilTime)	A8 – Structural Dynamics		<i>Túlio Bittencourt (Brazil)</i> <i>Pedro Montenegro (Portugal)</i>
Friday, April 9 th 2021 20h00 - 20h10 (GMT+1) / 16h00 - 16h10 (BrazilTime)	Closing Ceremony		

Sessions PS1, PS2, PS3 and PS4 and Closing C. – Main page (<https://events.eng.ufmg.br/w/sim2021>)

Sessions A1, A3, A5 and A7 – Room 1

Sessions A2, A4, A6 and A8 – Room 2

Thursday, April 8th 2021	
13h00	SIM 2021 Opening Session
13h10	Plenary Session 1: Notch and size effects in metal fatigue: recent advances, <i>Shun-Peng Zhu</i> , University of Electronic Science and Technology of China, Chengdu, China Chair: José A.F.O. Correia University of Porto, Portugal
14h00	Session A1 Renewable Energy Structures - Chairs: Tiago Ferradosa (Portugal) and Nicholas Fantuzzi (Italy)
14h00	Recent advances on fatigue reliability of wind turbine: A review (SIM_013) Ding Liao, Shun-Peng, J. Correia, A. De Jesus, R. Calçada
14h15	Horizontal and Vertical Axis Wind Turbines on Existing Jacket Platforms: A Comparative Study (SIM_065) P. Mendes, J. Correia, J.M. Castro, N. Fantuzzi, D. Haselibozchaloe, L. Manuel
14h30	Recent knowledge on rip-rap scour countermeasures for offshore structures (SIM_035) T. Fazeres-Ferradosa, F. Taveira-Pinto, P. Rosa-Santos, H. Carvalho
14h45	Advanced research on marine renewable energies and ocean systems (SIM_036) T. Fazeres-Ferradosa, F. Taveira-Pinto, P. Rosa-Santos
15h00	Analysis of Wind Speed and Assessment of Wind Energy Potential on the Coast of Dar es Salaam, Tanzania using Weibull Distribution Method (SIM_031) E. Michael, D.D.D.P. Tjahajana, A.R. Prabowo
15h15	Simplified fatigue damage assessment based on the hot-spot stress approach using numerical and analytical solutions of an offshore tubular KT joint (SIM_038) B.V. Ávila, H. Carvalho, J.A.F.O. Correia
15h30	Feasibility Study for the Reuse of a Steel Offshore Platform as the Support Base of a Wind Tower (SIM_044) V.M. Quissanga, J.G. Santos da Silva
15h45	Methodologies for Fatigue Life Assessment based on Analytical and Num. Local Strains using Hot-spot Concept applied to Welded Details (SIM_063) C.O. Viana, H. Carvalho, J.A.F.O. Correia
16h00	Break

Thursday, April 8th 2021

14h00	Session A2 Structural Integrity and Fatigue - Chairs: José A.F.O. Correia (Portugal) and Shun-Peng Zhu (China)
14h00	Notch fatigue life prediction under size effect using critical distance theory (SIM_052) Jin-Chao He, Shun-Peng Zhu, Xiao-Peng Niu, Ding Liao
14h15	Strain energy-based approach for probabilistic fatigue life prediction of notched components (SIM_053) Xue-Kang Li, Sijia Chen, Shun-Peng Zhu, Ding Liao, Jie-Wei Gao
14h30	A modified energy field intensity approach for notch fatigue analysis under size effect (SIM_054) Yan-Lai Wu, Shun-Peng Zhu, Wen-Long Ye
14h45	Probabilistic fatigue evaluation of notched components using critical distance theory under size effect (SIM_055) Wen-Long Ye, Zlling Zhang, Shun-Peng Zhu, Xue-Kang Li
15h00	Notch fatigue analysis of metals using CPZ and TCD theories (SIM_068) A.T. Taddesse, Shun-Peng Zhu, Ding Liao
15h15	Probabilistic Fatigue Life Prediction of a Rail Vehicle Axle Based on Small-Scale Fatigue Data (SIM_060) P. Costa, J. Correia, Shun-Peng Zhu, Sheng-Chuan Wu, A. De Jesus
15h30	Probabilistic Fatigue Strength Modelling based on various statistical approaches for a Double-Side Welded Connection (SIM_066) P. Mendes, R. Dantas, J. Correia, N. Fantuzzi, G. Lesiuk, A. Jesusa, L. Manuel, F. Berto
15h45	The influence of the Weibull parameter estimation method in the construction of P-S-N curves of small sample of fatigue (SIM_059) J.F. Barbosa, A.N. Sirokyb, J.A.F.O. Correia, M. Calvente, R.C.S. Freire Júnior
16h00	Break

Thursday, April 8th 2021	
17h00	Plenary Session 2: Some modelling aspects for retrofitting and decommissioning activities in offshore environment, <i>Nicholas Fantuzzi</i> , University of Bologna, Bologna, Italy Chair: Grzegorz Lesiuk, Wroclaw University of Science and Technology, Poland
18h00	Session A3 Steel and Composite Structures - Chairs: Hermes Carvalho (Brazil) and Hermano Cardoso (Portugal)
18h00	Elastic Critical Moment of Lateral-Distortional Buckling of Steel-Concrete Composite Beams under Non-Uniform Hogging Moment (SIM_004) L. S. Nery; J. V. F. Dias; R. B. Caldas; R. H. Fakury
18h15	Study on the lateral distortional buckling sensitivity to geometrical imperfections in steel-concrete composite beams (SIM_010) N. C. F. Filla, J. V. F. Dias, R. B. Caldas, R. H. Fakury
18h30	Design Resistant Axial Force calculation based on NBR-14762 (SIM_005) L. Mapa, D. Resende and A. Miranda
18h45	Constraint on the local buckling of the steel plate, provided by the concrete component in composite steel-concrete sections under pure compression (SIM_008) D. A. Barbosa, R.B. Caldas, H. Carvalho, A.L.R. Castro e Silva and J.F. Reis
19h00	Behavior of clothoidal longitudinal stiffener on elastic stability of steel plates (SIM_012) J. F Reis and R. B. Caldas
19h15	Longitudinally stiffened plate under pure bending (SIM_037) B.M.S. Melo, H. Carvalho, A.L.R. Castro e Silva, D.A. Barbosa, J.O. Ferreira Filho, R.B. Caldas
19h30	Review Optimizing Magnetorheological Brake Design and Characteristics to Improve Braking Torque (SIM_026) A. Lutanto, Ubaidillah, A. Rio Prabowo, Z. Arifin
19h45	
20h00	Finish

18h00	Session A4 Safety Assessment, Maintenance, Retrofit and Strengthening of Structures / Structural Integrity - Chairs: Diogo Ribeiro (Portugal) and J.G. Santos da Silva (Brazil)
18h00	Automatic detection of exposed steel rebars based on deep-learning techniques and Unmanned Aerial Vehicles (SIM_033) P. Lopes, D. Ribeiro, R. Santos, R. Cabral, R. Calçada
18h15	Nonlinear Analysis of Storage Tanks Assisted by Laser Scan Dimensional Inspection Techniques (SIM_042) M.A. Lopes, F.J.C.P. Soeiro, J.G. Santos da Silva
18h30	Optimized FORM for accurate reliability assessment of concrete gravity dams (SIM_046) S. Ohadi, J. Jafari-Asl, M. Ben Seghier, Hermes Carvalho, Jose A. F. O. Correia
18h45	Use of the box-behnen method to decrease measurement uncertainty in the PIG MFL inspection technique (SIM_058) H.A. Costa Júnior, J.F. Barbosa, J.J. Oliveira Júnior, H. Carvalho
19h00	Fatigue life prediction of S235 based on the strain energy model (SIM_014) B. Pedrosa, J. Correia, C. Rebelo, G. Lesiuk, A. de Jesus, M. Veljkovic
19h15	Fracture characterization of hybrid bonded joints for pure mode I (SIM_070) R. Dantas, A. Mohabeddine, M. Moura, R. Moreira, G. Lesiuk, J. Correia, A. De Jesus
19h30	Application of Sandwich Panels in Steel Structures (SIM_072) A. Vidwans, J.A.F.O. Correia
19h45	Retrofitting of capacity deficit timber beams: An experiment study (SIM_022) M.Adil Dar, A.Fayeq Ghowsi, Akshay Saxena, H. Carvalho, A.R.Dar
20h00	Finish

Friday, April 09th 2021	
13h00	Plenary Session 3: Structural integrity assessment of the railway infrastructure, <i>Rui Artur Bárto</i> lo Calçada, University of Porto, Porto, Portugal Chair: Shun Peng-Zhu, University of Electronic Science and Technology of China, China
14h00	Session A5 Steel, Composite and Concrete Structures - Chairs: João Paulo Rodrigues (Portugal) and Rodrigo Caldas (Brazil)
14h00	Design of Redundant Members for Latticed Steel Towers used in Power Transmission Lines (SIM_041) M.S. Rechtman, J.G. Santos da Silva
14h15	Influence of the steel constitutive model in numerical analyses with shear connector applied on concrete-filled steel tubular columns (SIM_009) E. G. Silveira, R. B. Caldas, H. S. Cardoso
14h30	Comparative study of steel-concrete composite beams for railway bridges (SIM_056) R. Santos, H. Carvalho, R. B. Caldas, T. N. Bittencourt, R. F. Santos
14h45	Numerical Modeling of Elliptical Concrete Filled Hollow Columns in case of Fire (SIM_002) Sérgio R. O. Q. Braga , João P. C. Rodrigues, António P.M.Correira, Pedro Dias Simão
15h00	Ductility of bolted steel joints at high temperatures (SIM_017) F.C.T. Gomes and J.P.C. Rodrigues
15h15	Comparing the behavior of reinforced concrete columns embedded in walls and subjected to fire (SIM_007) B. Matos, F. Ferreira, J. P. C. Rodrigues and R.B. Caldas
15h30	Elastic Critical Moment of Lateral Distortional Buckling of Castellated Composite Beams Under Non-Uniform Hogging Moment (SIM_020) C. C. Silva, R. B. Caldas, R. H. Fakury, J. V. F. Dias
15h45	Lateral-torsional buckling resistance of cellular steel beams under fire situation (SIM_068) C. C. de Faria, H. Carvalho, R. H. Fakury, L. F. Grilo
16h00	Break

Friday, April 09th 2021	
14h00	Session A6 Structural Integrity and Fatigue - Chairs: Abílio M.P. De Jesus (Portugal) and Dariusz Rozumek (Poland)
14h00	Comparative study of fracture mechanisms in 7050 and 7075 aluminium alloys (SIM_003) D.F. Galvão, R. Branco, J.D. Costa, A.P. Amaro, A.P. Piedade, L. Borrego, C. Pereira and Artur Mateus
14h15	Analysis and discussion on statistical evaluation of strain-life data of modern structural steels (SIM_061) A. Mourão, J.A.F.O. Correia, T. Bittencourt, R. Calçada
14h30	Mechanical characterization of the Desengano's iron bridge from the 19th century (SIM_062) Oliveira, I. G.; Pardal, J. M.; José A.F.O. Correia.; Berto, F
14h45	Estimation of strain-life properties through the strain energy density-based Huffman model for various aluminium alloys (SIM_071) V. H. Ribeiro, J.A.F.O. Correia, P. Huffman, G. Lesiuk, A.C. Gonçalves, A. De Jesus, F. Berto
15h00	Interlaminar fracture toughness determination in an inverse FML material under mode I loading condition (SIM_051) Sz. Duda, G. Lesiuk, M. Smolnicki, T. Osiecki
15h15	Mode I and mixed-mode (I+II and I+III) fatigue crack growth characterization of 42CrMo4 steel after heat treatment (SIM_050) M. Duda, D. Rozumek, G. Lesiuk, M. Smolnicki
15h30	Experimental and numerical study of fatigue crack growth and crack closure phenomenon in constructional steel under mixed-mode loading conditions (SIM_023) G. Lesiuk, J.A.F.O. Correia, D. Rozumek, M. Smolnicki, A.M.P. De Jesus
15h45	Estimating Failure Mechanism of Steel Specimens using Stress-Corrosion-Cracking (SSC) Testing Methods: State and Development (SIM_024) E. D. W. S. Putri, T. Triyono, A. R. Prabowo
16h00	Break

Friday, April 09th 2021	
17h00	Plenary Session 4: Long-term operation of bridge steel and fatigue crack growth modelling based on energy approach, <i>Grzegorz Lesiuk</i> , Wroclaw University of Science and Technology, Wroclaw, Poland Chair: Ricardo Branco, University of Coimbra, Portugal
18h00	Session A7 New Materials & Advanced Computational Methods - Chairs: Ricardo Branco (Portugal) and Lapo Gori (Brazil)
18h00	Long term Behaviour of Recycled Aggregate Concrete under sustained loading (SIM_021) B.S. Rao, AmpliSuresh and S.M.Naik
18h15	Parameter Optimization and Innovation on Manufacturing Process of Metal Matrix Composites: State and Development of the Manufacturing Process (SIM_025) H.I. Akbar, E. Surojo, D. Ariawan, A.R. Prabowo
18h30	Microstructural analysis and radial compression behaviour of GFRP/CFRP composite bars (SIM_048) Lesiuk G., Duda Sz., Barcikowski M., Ziółkowski G., Żołyńska K., Zielonka P., Warycha J., Stabla P., Lubecki M., Filipiak-Kaczmarek A., Błażejowski W.
18h45	Review of Polypropylene in Fused Deposition Modelling A Filament Engineering and Processing Parameter (SIM_027) R.B. Kristiawan, A.R. Prabowo, F. Imaduddin, D. Ariawan
19h00	Cyclic analysis of isotropic damage models under the nonlocal approach (SIM_018) B. C. Campos, L. R. S. Pereira, S. S. Penna
19h15	Isotropic damage models for physically nonlinear cyclic analysis using the secant operator (SIM_019) L.R.S. Pereira, B.C. Campos, S.S. Penna
19h30	Calibration of Water Distribution Systems Hydraulic Models Using Nature Inspired Algorithm (SIM_047) J. Jafari-Asl, M. Ben Seghier, S. Ohadi, Hermes Carvalho, Jose A. F. O. Correia
19h45	Review of Heat Transfer by Convection in Magnetorheological Fluid (SIM_028) Z. Avista, Ubaidillah, I. Yaningsih, A. Rio Prabowo
20h00	Finish

Friday, April 09th 2021	
18h00	Session A8 Structural Dynamics - Chairs: Túlio Bittencourt (Brazil) and Pedro Montenegro (Portugal)
18h00	Experimental calibration and validation of a freight wagon numerical model under real operating conditions (SIM_032) C. Bragança, J. Neto, N. Pinto, D. Ribeiro, H. Carvalho, R. Calçada
18h15	Analysis of the influence of the wind models in the train running safety against crosswinds beams (SIM_034) P.A. Montenegro, R. Heleno, H. Carvalho, R. Calçada
18h30	Vibration Analysis of Highway Bridges Based on a Progressive Pavement Deterioration Model (SIM_039) A.C. Soares da Silva, J.G. Santos da Silva
18h45	Crashworthiness performance simulation of additively manufactured thin-walled tubular impact absorbers filled with lattice structures (SIM_029) V. Veloso
19h00	Dynamic Structural Response of Buildings under Longitudinal and Transversal Wind Actions (SIM_040) L. de S. Bastos, J.C. Mota Silva and J.G. Santos da Silva
19h15	Human Comfort Analysis of Steel-Concrete Composite Floors Subjected to Rhythmic Loadings (SIM_043) N.A.C. Branco, F.A. de Sousa, J.G. Santos da Silva
19h30	Human Comfort Assessment Of Steel-Concrete Composite Floors of Buildings (SIM_045) B. Ferreira, H. Carvalho, J. Silva, R. Caldas, J. Aguiar, T. Bittencourt
19h45	Finish

GENERAL INSTRUCTIONS

. Basic requirements

Your computer should have a camera and a microphone.

It is recommended that you use a cable internet connection instead of the wireless network.

Plug your laptop to electricity before presenting.

Test your camera and microphone before the session of your presentation.

Make sure you are centred in the image of your camera.

. Sessions

ZOOM MEETINGS LINK:

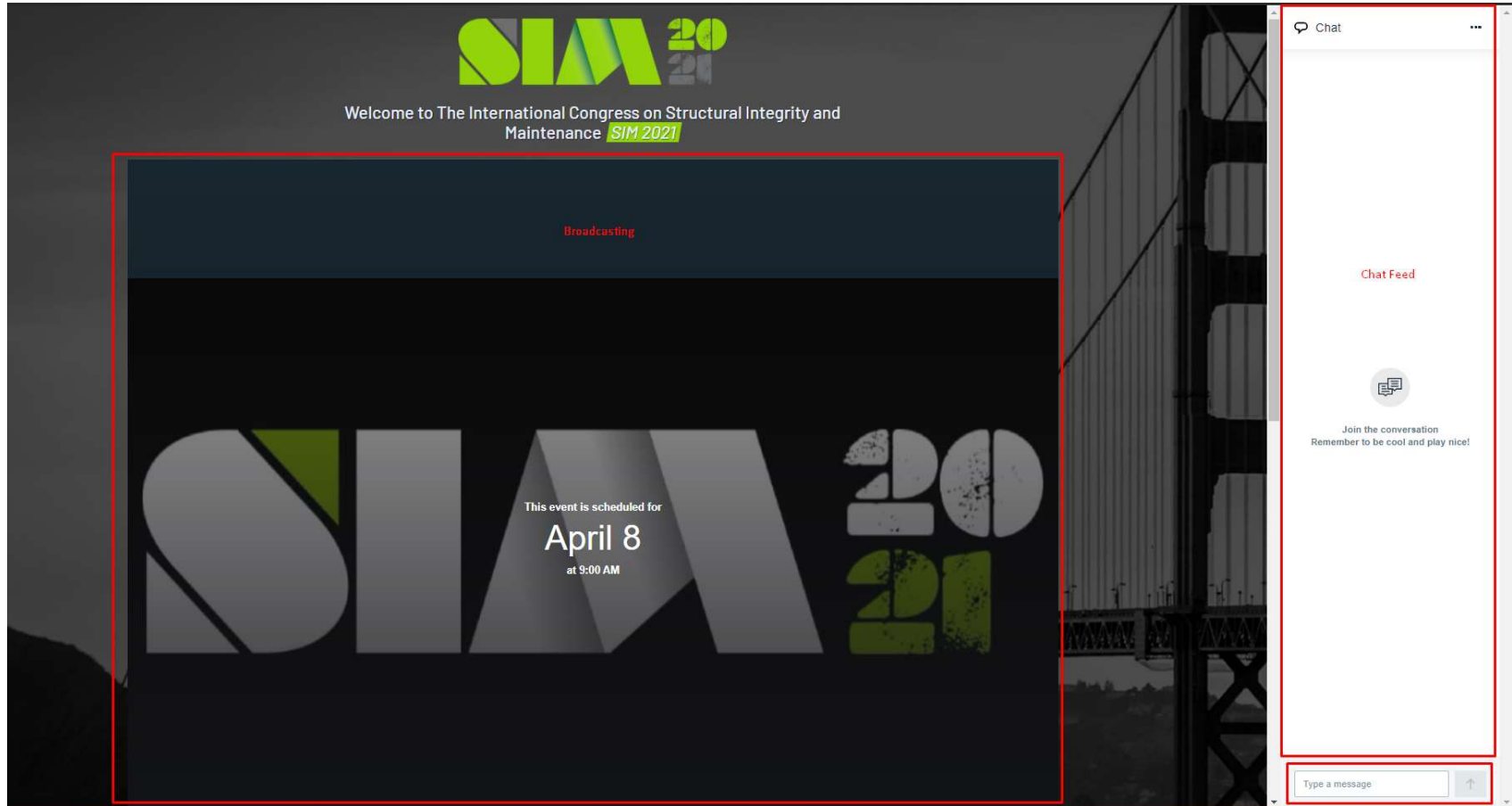
- Room 1 – Day 1
<https://us02web.zoom.us/j/82175091596>
- Room 2 - Day 1
<https://zoom.us/j/97894542458>

- Room 1 – Day 2
<https://us02web.zoom.us/j/85607672668>
- Room 2 - Day 2
<https://zoom.us/j/96426780227>

. Broadcasting

The conference will be broadcasted on the following link:

<https://events.eng.ufmg.br/w/sim2021>



The image shows a Zoom meeting interface. The main window displays a broadcasted event page for SIM 2021. The page features the SIM 2021 logo at the top, followed by the text "Welcome to The International Congress on Structural Integrity and Maintenance SIM 2021". Below this, a red "Broadcasting" indicator is visible. The main content area shows the event title "SIM 2021" in large, stylized letters, with the text "This event is scheduled for April 8 at 9:00 AM" overlaid. To the right, a chat window is open, showing a "Chat Feed" section with a "Join the conversation Remember to be cool and play nice!" message and a "Type a message" input field at the bottom.

ADDITIONAL INSTRUCTIONS FOR SPEAKERS

. Timing

45 minutes for the keynote lectures

15 minutes for the regular presentations

IMPORTANT: Chairs have to strictly control the time slot allocated to each presentation.

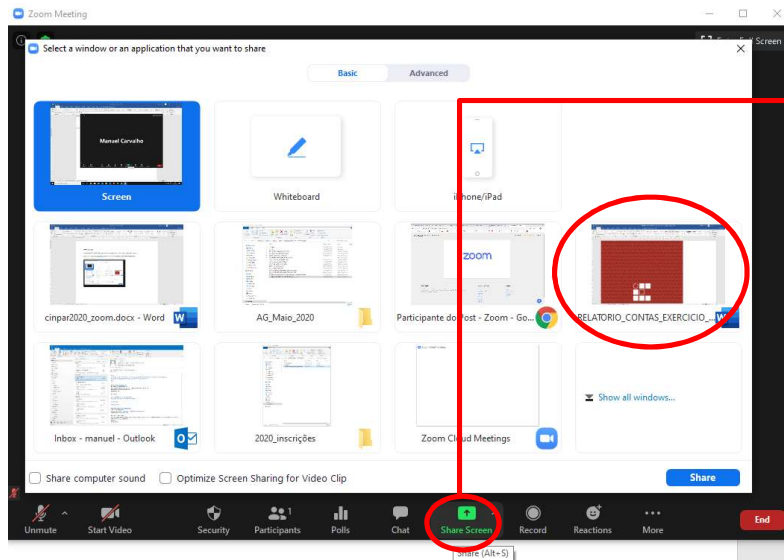
. PowerPoint

Oral presentations need to be made in English.

. Oral Presentation

In your session, you should open your PowerPoint presentation before the Chair invites you start the presentation.

After the introduction from the Chair, the speaker should start the presentation, sharing the screen with the corresponding PowerPoint file. This will allow all the audience to see the presentation in full-screen and a small box with the camera image of the speaker at the top-right corner of the screen. In other hand, the chair will start presentations sent to the congress in advance automatically.

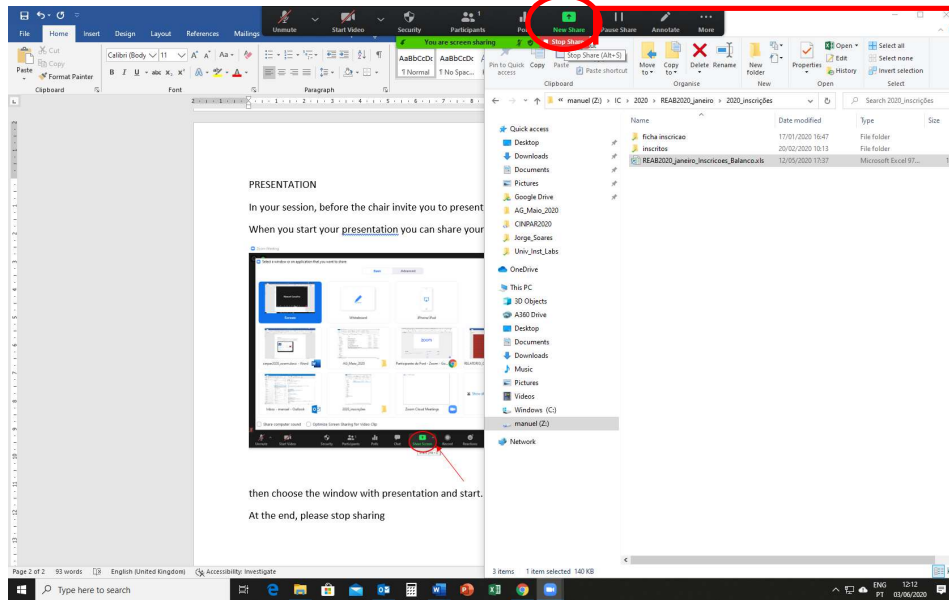


1st - SCREEN SHARING ICON

2nd - SHARE YOUR POWERPOINT
PRESENTATION (previously opened) and start

IMPORTANT: Right at the **end** of your presentation, please, **stop sharing** your screen and **mute** your **micro**.

STOP SHARING ICON (usually at the top of the monitor)



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