

**23rd International Nondestructive Testing and
Evaluation of Wood Symposium
Conference Guide Book**



**Campinas, Brazil
September 17-21, 2024**



**23rd International
Nondestructive Testing
and Evaluation of Wood
Symposium**

September 17-21, 2024
UNICAMP, São Paulo, Brazil

Supporting Institutions



Conference Guide Book

Campinas, Brazil

17 to 21 September 2024



Supporting Institutions



Michigan Tech
College of Forest Resources
and Environmental Science



IBRAMEM



Sponsors



Welcome

We're excited to have you at the 23rd International Symposium on Nondestructive Testing and Evaluation of Wood! We hope you enjoy these engaging days of learning and sharing. Welcome to our university, our city, and our country—make yourself at home!

Hosted by Universidade Estadual de Campinas (Unicamp).

This event is co-hosted by the School of Agricultural Engineering (FEAGRI) of University of Campinas, the USDA Forest Service Forest Products Laboratory (FPL), the Forest Products Society (FPS), and the Brazilian Association on Nondestructive Testing and Inspection (ABENDI); supported by the International Union of Forest Research Organization (IUFRO) Division 5, São Paulo Research Foundation (FAPESP), Coordination of Superior Level Staff Improvement (CAPES) and Found to support teaching, research and extension (FAEPEX/Unicamp).

Co-Chairs

Dr. Robert J. Ross, Project Leader, USDA Forest Products Laboratory, USA

Dr. Raquel Gonçalves, Universidade Estadual de Campinas

International Organizing Committee

Dr. Robert J. Ross, Project Leader, USDA Forest Products Laboratory, USA

Dr. Xiping Wang, Research Forest Products Technologist, USDA Forest Products Laboratory, USA

Dr. Alexis Achim, Professor, Université Laval (UL)

Dr. László Béjo, University of West Hungary, Hungary

Dr. Raquel Gonçalves, University of Campinas, Brazil

Dr. Francisco Arriaga Martitegui, Universidad Politécnica de Madrid, Spain

Dr. Udo H. Sauter, Forest Research Institute Baden-Württemberg, Germany

Dr. C. Adam Senalik, FPL, USA

Dr. Houjiang Zhang, Beijing Forestry University, China

Local Organizing Committee

Dr. Brunela Pollastrelli Rodrigues, Assistant Professor Wood Utilization and Biomaterials, Department of Forestry and Environmental Conservation. College of Agriculture, Forestry and Life Sciences, Clemson University

Dr. Cinthya Bertoldo, Assistant Professor, School of Agricultural Engineering (FEAGRI), University of Campinas (UNICAMP)

MSc. Carolina Kravetz, PhD student, School of Agricultural Engineering (FEAGRI), University of Campinas (UNICAMP)

Eng. Larissa Tiago Volpi - Master student, School of Agricultural Engineering (FEAGRI), University of Campinas (UNICAMP)

Dr. Rafael Mansini Lorensani, CEO Valora Madeira

Volunteers

MSc. Chiara Barros Secco – PhD student, School of Agricultural Engineering (FEAGRI), University of Campinas (UNICAMP)

Eng. Elidiani Melissa de Moura - Master student, School of Agricultural Engineering (FEAGRI), University of Campinas (UNICAMP)

MSc. Fernando Augusto Franco Batista, Landscape Architect

MSc. Júlia Jane Alves Leme, PhD student, School of Agricultural Engineering (FEAGRI), University of Campinas (UNICAMP)

MSc. Karen Christina de Freitas, PhD student, School of Agricultural Engineering (FEAGRI), University of Campinas (UNICAMP)

Dr. Paulo Gustavo Krejci Nunes, Materials and Structures Laboratory Technician, School of Agricultural Engineering (FEAGRI), University of Campinas (UNICAMP)

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GENERAL PROGRAM SCHEDULE

Monday, September 16, 2024

11:30 – 15:30	Social gathering with International Organizing Committee and Local Organizing Committee Meeting
15:30 – 17:00	Meeting - International Organizing Committee and Local Organizing Committee

Tuesday, September 17, 2024 – Visiting Professor’s House (CPV)

8:00 – 17:00	Workshop on Urban Tree Evaluation and Monitoring – A Systemic Approach – CPV Room New York
17:00 – 18:00	Registration – CPV main entrance
18:00 – 21:00	Welcome Reception – CPV Restaurant

Wednesday, September 18, 2024 – Convention Center (CDC) and Tent

8:30 – 12:00	Registration - Hall
8:30 – 9:20	Opening Ceremony – Auditorium III
9:20 – 9:50	Unicamp “Ziper na Boca” Choir presentation
9:50 – 12:00	General Session: Nondestructive Testing and Evaluation of Wood - Scientific Advances and Practical Challenges – Auditorium III
12:00 – 14:00	Lunch – CPV Restaurant
Concurrent Oral sessions – Auditorium I, II and III	
	Wood Structure Condition Assessment Auditorium I
14:00 – 15:30	In-Forest Wood Quality Assessment Auditorium II
	Nondestructive Evaluation of Engineered Wood Products Auditorium III
15:30 – 16:00	Equipment Exhibition and Coffee Break Tent

Concurrent Oral sessions – Auditorium I, II and III	
	Wood Structure Condition Assessment Auditorium I
16:00 – 17:00	In-Forest Wood Quality Assessment Auditorium II
	Nondestructive Evaluation of Engineered Wood Products Auditorium III
17:30	Bus departure to the Restaurant
18:00 – 23:00	Banquet Vila Paraíso Restaurant – Joaquim Egidio, Campinas

Thursday, September 19, 2024 – Convention Center (CDC) and Tent

9:00 – 12:00	Registration – CDC Hall
Concurrent Oral sessions- Auditorium II and III	
	Urban Tree Inspection and Risk Analysis Auditorium II
9:00 – 10:30	Wood Material Characterization Auditorium III
10:30 – 11:00	Equipment Exhibition and Coffee Break Tent
11:00 – 12:00	Gold Sponsor Space – Suzano Auditorium II
12:00 – 14:00	Lunch – CPV Restaurant
Concurrent Oral sessions- Auditorium II and III	
	Urban Tree Inspection and Risk Analysis Auditorium II
14:00 – 15:30	Wood Material Characterization Auditorium III
15:30 – 16:00	Equipment Exhibition and Coffee Break Tent
Concurrent Poster sessions – Auditorium I, II and III	
	Urban Tree Inspection and Risk Analysis and In-Forest Wood Quality Assessment Auditorium I
16:00 – 17:00	Wood Structure Condition Assessment, Wood Material Characterization and Nondestructive Evaluation of Engineered Wood Products Auditorium II
	General Auditorium III
17:30	Vans departure to the "Bar Giovannetti", Cambuí

18:00 – 21:00 Cocktail Hour at Bar Giovannetti (optional and on your own Program)

Friday, September 20, 2024 – Convention Center (CDC) and Tent

9:00 – 12:00	Registration - Hall
Concurrent Oral sessions- Auditorium I, II and III	
	Nondestructive Evaluation of Engineered Wood Products Auditorium I
9:00 – 10:30	In-Forest Wood Quality Assessment Auditorium II
	Wood Material Characterization Auditorium III
10:30 – 11:00	Equipment Exhibition and Coffee Break Tent
Concurrent Oral sessions- Auditorium I, II and III	
	Nondestructive Evaluation of Engineered Wood Products Auditorium I
11:00 – 12:00	In-Forest Wood Quality Assessment Auditorium II
	Wood Material Characterization Auditorium III
12:00 – 14:00	Lunch CPV Restaurant
14:00 – 15:00	Workshop Round Table: Results of inspection technologies applying in a tree of the campus Auditorium I
15:00 – 15:30	Special Session - Conference: Some considerations about the non-contact ultrasonic method and acoustic microscopy for the inspection of wood painted panels of cultural heritage
15:30 – 16:30	Closing Ceremony
17:30	Vans departure to the "Buteco do Jair", Barão Geraldo
18:00 – 21:00	Cocktail Hour at Buteco do Jair (optional and on your own Program)

Saturday, September 21, 2024

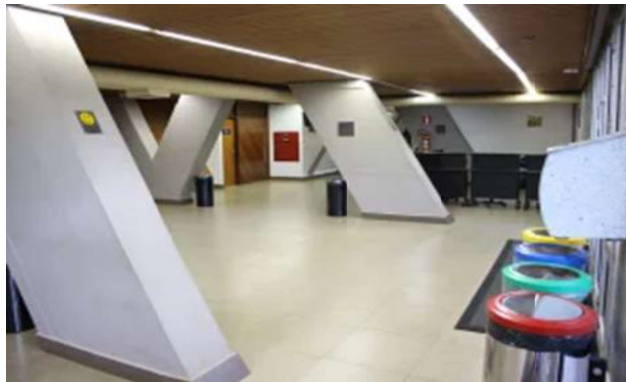
7:00 – 19:00	São Paulo City tour (optional and on your own Program)
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VENUE

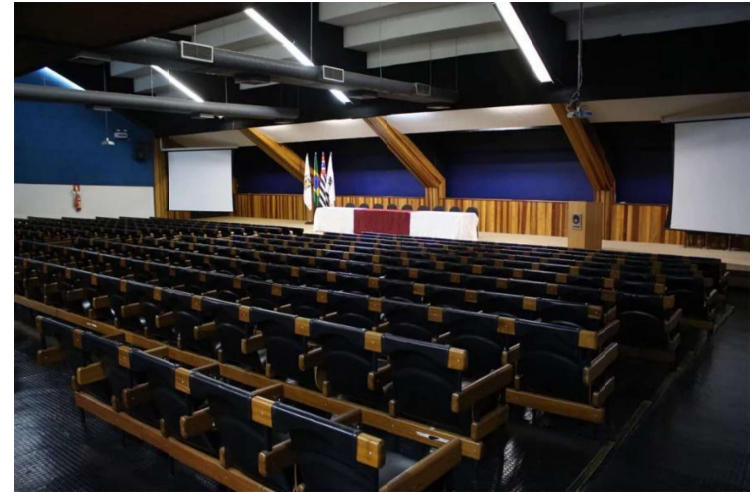
Convention Center – CDC UNICAMP



Convention Center (External View)



Convention Center Hall



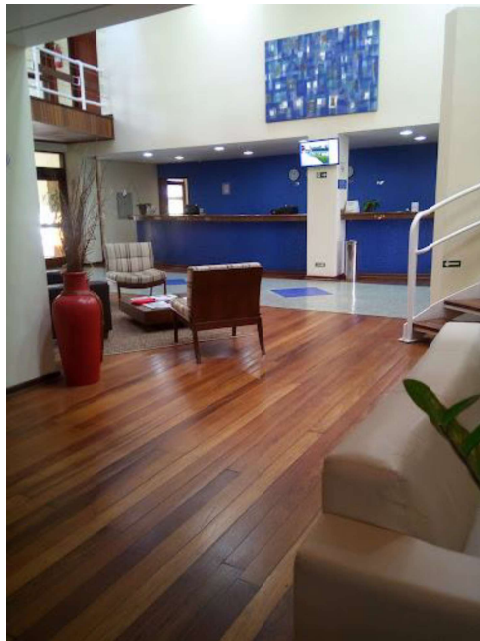
Convention Center Auditorium I



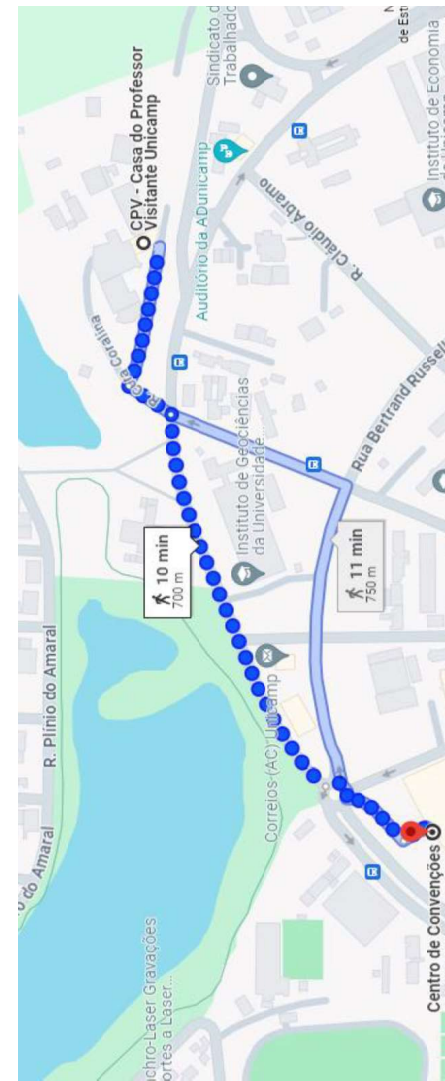
Convention Center Auditorium II



Front view - Visiting Professor House (CPV)/Unicamp



Reception desk – CPV/Unicamp



Route from CPV to the Convention Center (700 m)

CONFERENCE CHAIR BIOS



Robert J. Ross

Dr. Robert Ross recently retired from the USDA Forest Products Laboratory (FPL), Madison, WI. He served in a variety of leadership roles during his 35 years at FPL.

His research focused on the development and use of nondestructive evaluation technologies for wood products and structures. Bob has worked on a variety of projects, including in-place assessment of members of the USS Constitution. He has written or co-authored more than 350 technical reports and articles and holds thirty-one U.S. and foreign patents. He was Technical Editor for the Centennial Edition of the Wood Handbook:

Wood as an Engineering Material and is a Fellow in the International Academy of Wood Science. He holds BS (Wood Science) and MS (Engineering Mechanics) degrees from Michigan Technological University, and a PhD (Engineering Science) from Washington State University.

Raquel Gonçalves

Raquel is a Civil Engineer with a master's and PhD in Structural Engineering (research focused on Timber Structures) and a Post-Doctorate in Forest Engineering, with a focus on non-destructive testing (ultrasonics), from Université Laval, Québec, Canada. She is currently a Full Professor at the Universidade Estadual de Campinas (UNICAMP), where she is responsible for teaching Timber Structural Design at the undergraduate level and Theoretical Aspects of Ultrasonics Applied to Materials at the graduate level.

Her research focuses on non-destructive testing applied to the characterization, classification, and inspection of wood, timber structures, and trees (both forest and urban). As a result of her practical experience with the industry, she has worked on the development of ultrasonic equipment and software for ultrasonic tomography imaging.

WORKSHOP BIOS



Sergio Brazolin

Biologist, PhD in forest resources in the University of São Paulo, Piracicaba, Brazil. Researcher at Technological Research Institute of São Paulo State – IPT for 38 years, offering training and developing projects, services and P&D&I for public and private sectors in the following areas: biodeterioration of wood and trees (decaying fungi, termites and beetles), biomechanics and risk analysis of trees, nondestructive methods of trees evaluation and, currently, in urban afforestation planning, emergency plans for falling trees in extreme weather events and conservation plans for Atlantic Forest. Member of Brazilian Society of Urban Afforestation – SBAU since 2006.



Houjiang Zhang

Dr. Houjiang is a full professor at Beijing Forestry University, China. He has over 15 years of research experience in the areas of nondestructive evaluation of historic wood structures and urban trees. He has published over 130 papers, been granted nine Chinese patents. He teaches courses at both undergraduate and graduate levels. He also serves as the Research Group Deputy Coordinator of International Union of Forestry Research Organization (IUFRO) D5.01.09.

WORKSHOP BIOS



Steffen Rust

Steffen Rust is Professor of Arboriculture at the University of Applied Science and Art in Göttingen, Germany. His main fields of research are non-destructive methods for tree risk assessment and tree water relations. Steffen is one of the developers of stress wave tomography for trees. Recent studies concentrate on ground penetrating radar, electrical resistivity tomography for stems and root systems, as well as static pulling tests, analysis of tree vibration, and the application of artificial intelligence in tree risk assessment.

Brunela Rodrigues

Brunela currently works as an Assistant Professor of Wood Utilization and Biomaterials at Clemson University, USA, where she is also a member of the Wood Utilization and Design Institute. Before accepting her position at Clemson University, she worked as a Postdoctoral Associate at the Department of Sustainable Bioproducts at Mississippi State University, USA. Brunela is originally from Brazil, where she pursued her degrees in Forest Engineering and master's and PhD in Forest Sciences from the Federal University of Espirito Santo. During her PhD, she worked closely with recognized USDA Forest Products Laboratory research engineers. She has been a very active member of the Forest Products Society, organizing sessions and chairing the Technical Interest Group (TIGs) in Processing and Wood Quality. Her research interests include wood quality, biomass utilization, and nondestructive evaluation of trees and wood.



WORKSHOP BIOS



Gustavo Garcia

Gustavo has Bachelor degree in Biological Sciences at UFMS (2008), Master degree in Agricultural Engineering at Campinas State University (2018). Arborist certified by the International Society of Arboriculture, specialized in afforestation planning and tree management. He has been providing services in these area since 2009, in addition to provide training and courses on arborism and create and publishing content on social media.

Camila Alonso Santos

Camila holds a degree in Forest Engineering from the School of Agricultural Science of Botucatu – UNESP. Throughout her career, she has worked on projects in community outreach within rural areas and environmental education, plant nutrition, geoprocessing, agroecology, floristic surveys, ecological restoration, urban forestry, and landscaping. Currently, she oversees the green spaces at Unicamp. She is responsible for all activities involving the implementation and management of green spaces, including planting, maintaining and removing trees, trees inspection, landscaping, permanent preservation areas and environmental licensing related to vegetation. She's also a partner in the "Ecological Corridors Project," which involves ecological restoration in permanent preservation areas and connectivity strips. Those connect forest fragments within and outside the university areas to promote maintaining and enhancing biodiversity and ecosystem services.



GENERAL SESSION BIOS



Adam Senalik

Adam Senalik is a Research General Engineer with the USDA Forest Service, Forest Products Laboratory (FPL). In 2005, he left a career in heavy truck collision forensic engineering to pursue his doctorate in non-destructive evaluation of wood structures and utility poles. While at FPL, his focus has been non-destructive testing of wood, analysis of timber bridge structures and abutments, and moisture cycling effects on the strength of wood composites.

He is currently involved in evaluating the use of ground penetrating radar as an inspection tool for wood structures and high energy response of mass timber. He is the Co-chair of the 2024 organizing committee for the International Nondestructive Testing and Evaluation Wood Symposium and is technical advisor to the American Lumber Standards Committee (ALSC) Board of Review.



Laurice Spinelli

Dr. Laurice Spinelli Correa is an Assistant Research Professor at the Sustainable Bioproducts Department at Mississippi State University (MSU), who is stationed at the USDA-Forest Products Laboratory, Madison-WI. Originally from Brazil, she started her academic career at the Federal University of the Valleys of Jequitinhonha and Mucuri (UFVJM), where she received a bachelor's degree in Forest Engineering. Dr. Spinelli Correa continued her studies at MSU, where she pursued a Master's degree in Sustainable Bioproducts and a PhD in Forest Resources with a Sustainable Bioproducts concentration.

Her areas of interest are mechanics of wood & wood products, engineered wood products & mass timber, wood structures & construction, nondestructive evaluation of wood, and fire hardening of wood structures. Dr. Spinelli Correa is conducting research on protecting wooden poles from wildfires. Additionally, she is involved in projects focusing on developing lignin-foam based composites, condition assessments of buildings, and non-destructive evaluation of wood structures.

GENERAL SESSION BIOS



Peter Niemz

Peter is a professor and researcher in the field of wood science, with a focus on wood physics, wood technology, and the mechanical behavior of wood materials. He has contributed significantly to the understanding of the physical and mechanical properties of wood, including its thermal, hygric, and acoustic behavior. Niemz's research often intersects with practical applications in the wood industry, such as wood modification and the development of innovative wood-based materials. His academic career includes a long tenure at ETH Zurich, where he has been involved in both teaching and research. Niemz has supervised numerous doctoral theses and has been a key figure in the dissemination of wood science knowledge through his publications, including books, book chapters, and peer-reviewed journal articles. He has also been active in international collaborations, contributing to projects that seek to advance the field of wood science globally. Niemz's work is highly regarded for its depth and practical relevance, making him a respected figure in the scientific community focused on wood and biomaterials.

GENERAL SESSION BIOS



Xiping Wang

Dr. Xiping is a research scientist at the USDA Forest Products Laboratory (FPL), Madison, Wisconsin. His work at FPL focuses on nondestructive testing and evaluation of wood, condition assessment of wood structures, urban tree hazard assessment, and heat sterilization of wood for invasive species mitigation. He has led and conducted fundamental and applied research in the development of new methodologies and procedures for evaluating wood quality of standing trees and logs, and assessing the structure integrity of historic wood structures. He has published more than 200 research papers, been granted eight U.S. and foreign patents.

He received the 2018 Forest Service Deputy Chief's Distinguished Science Award and the 2019 Forest Service Chief's Award for Applying Knowledge Globally. Xiping is an Elected Fellow of the International Academy of Wood Science (IAWS) and the Associate Editor of the Journal of Materials in Civil Engineering (ASCE) and the Journal of Forest Science (SAF). He currently serves as the coordinator of IUFRO D5.01—Wood and Fiber Quality Research Group and holds adjunct faculty appointment at Michigan Technological University and Mississippi State University.

DETAILED PROGRAM SCHEDULE

Monday, September 16, 2024 – Joaquim Egidio

11:30 – 17:00 Meeting and social gathering with International and Local Organizing Committee.

Tuesday, September 17, 2024 – CPV/Unicamp

Workshop on Urban Tree Evaluation and Monitoring – A Systemic Approach.

8:00 – 8:15 Reception and material delivery

Lectures

CPV (Room New York - mezzanine)

I. Introduction

(Dr. Raquel Goncalves, Brazil)

II. Science and knowledge of trees as a basis for integrated management

(Dr. Brunela Rodrigues, USA)

III. Periodic tree inspections (levels 1, 2 and 3) for preventive and health monitoring: Theoretical basis for use NDT techniques

i) Visual inspection (levels 1 and 2)

(Dr. Sergio Brazolin – IPT, Brazil)

10h00 – 10:30

Coffee-break

CPV (Hall - Mezzanine)

ii) Tree inspection (level 3): Experience from around the world

Asia (10:30 – 10:50)

(Dr. Houjiang Zhang, Beijing Forestry University, China)

10:30 – 11:30

Europe (10:50 – 11:10)

(Dr. Steffen Rust, University of Applied Sciences and Arts Hildesheim, Germany)

South America (11:10 – 11:30)

(Dr. Raquel Goncalves, Unicamp, Brazil)

11:30 – 12:00	Post-inspection treatments (pruning, nutrition, support system) (MSc Gustavo Garcia - Tree way arboricultura, Brazil)
12:00 – 12:30	Growing the urban forest – Species selection, soil considerations and site Preparation (Camila Alonso Santos – Unicamp, Brazil)
12:30 – 13:30	Lunch CPV Restaurant
13:30 – 17:00	Application of inspection technologies in testing trees Campus of University of Campinas

Welcome Reception

17:30 – 18:00	Reception and material delivery CPV – Entrance Hall
18:00 – 21:00	Get-together cocktail CPV Restaurant

Wednesday, September 18, 2024 – CDC/Unicamp

8:30 – 12:00	Registration Unicamp Convention Center Front desk
8:30 – 9:20	Opening Ceremony Auditorium III Authorities from Unicamp and from the School of Agricultural Engineering, representatives of the ABENDI, international and local Committees and Co-chairs.
9:20 – 9:50	Unicamp “Ziper na Boca” Choir presentation (Auditorium III)

General Session – 9:50 – 12:00

Nondestructive Testing and Evaluation of Wood - Scientific Advances and Practical Challenges (Round Table). Auditorium III Moderator: Xiping Wang	
9:50 – 10:00	Introduction by Moderator
10:00 – 10:20	Scientific Foundations and Recent Advances Peter Niemz (Switzerland) From Laboratory Discovery to Commercialization and Wide Use
10:20 – 10:40	Robert Ross (EUA) Where are we with the use of NDE for wood materials and products?
10:40 – 11:00	Adam Senalik and Laurice Spinelli (USA) Melding artificial intelligence and nondestructive evaluation – A future approach
11:00 – 11:20	Raquel Gonçalves e Rafael Lorensani, Brazil
11:20 – 12:00	Panel Discussion/Questions and Comments - Moderator
12:00 – 14:00	Lunch CPV Restaurant

Concurrent Oral sessions - 14:00 – 15:30

Wood Structure Condition Assessment Auditorium I Moderator: Xinfeng Xie	
14:00 – 14:30	ID 228: Condition Assessment of Wood Structure of Jin Zhongdu Watergate Site – Houjiang Zhang – China
14:30 – 15:00	ID 261: Condition Assessment of Historic Wooden Ships – Christopher Adam Senalik – USA
15:00 – 15:30	ID 262: New ultrasound transducers employing wireless technology for large range of wood quality assessment applications – Yann Benoit - Switzerland



In-Forest Wood Quality Assessment Auditorium II Moderator: Cinthya Bertoldo	
14:00 – 14:30	ID 237: Influence of Edaphoclimatic Variations on Growth and Non-Destructive Parameters Obtained in Eucalyptus sp Clone Trees – Carolina Kravetz – Brazil
14:30 – 15:00	ID 281: Use of Non-Destructive Technologies for Detection of Compression Wood in Pinus Taeda Standing Trees – Ana Paula Coelho-Duarte – Uruguay
15:00 – 15:30	ID 231: Influence of resin extraction in the effectiveness of nondestructive evaluation of forestry industry – Monica Ruy – Spain



Nondestructive Evaluation of Engineered Wood Products Auditorium III Moderator: Laya Khademibami	
14:00 – 14:30	ID 260: Nondestructive Testing of Mechanical Properties of Reinforced Oak Wood Elements by Carbon and Glass Fibres Composite – Andrija Novosel – Croatia
14:30 – 15:00	ID 263: In-Field Inspection of Wooden Utility Poles Using Nondestructive Technology – Study Cases for Softwood and Hardwood – Yann Benoit – Switzerland
15:00 – 15:30	ID 298: Case Study: Classification of the modulus of elasticity of wood obtained through non-destructive testing for the manufacture of glued laminated timber (GLT) beams with the aim of meeting structural requirements of an executed structure. – Melissa L J S Silva – Brazil



15:30 – 16:00 Coffee and Equipment Exhibition - Tent

Concurrent Oral sessions - 16:00 – 17:00

Wood Structure Condition Assessment Auditorium I Moderator: Xinfeng Xie	
16:00 – 16:30	ID 250: Defect rating of wooden columns embedded in walls of ancient building based on multi-source data fusion and machine learning – Yufeng Li – China
16:30 – 17:00	ID 238: A Fusion Algorithm to detect the internal targets of the timbers based on the GPR data - Xi Wu – China



**In-Forest Wood Quality Assessment
Auditorium II**

Moderator: Cinthya Bertoldo

16:00 – 16:30	ID 313: Tree inspection: Experience from around the world – Australia - Vilius Gendvilas – Australia
16:30 – 17:00	ID 307: Nondestructive Evaluation of Wood Properties of Fire Damaged Hard Pines – Xiping Wang – USA



**Nondestructive Evaluation of Engineered Wood Products
Auditorium III**

Moderator: Laya Khademibami

16:00 – 16:30	ID 275: Influence of finger joints on the propagation of acoustic waves – Monica Ruy – Spain
16:30 – 17:00	ID 291: Using ultrasound to determine the static and dynamic MOE relationship of wood components for the species Apuleia leiocarpa – Suelem M F Macena – Brazil



17:30	Bus departure to the Restaurant
18:00 – 23:00	Banquet – Restaurant Vila Paraíso

Thursday, September 19, 2024 – CDC/Unicamp

9:00 – 12:00 Registration – Hall Convention Center - Unicamp

Concurrent Oral sessions - 9:00 – 10:30

**Urban Tree Inspection and Risk Analysis
Auditorium II**

Moderator: Vilius Gendvilas

9:00 – 9:30	ID 247: Non-destructive tomographic testing on monumental trees in the Sila National Park - South Italy – Andrea R Proto – Italy
9:30 – 10:00	ID 286: A new tomographic device for the non-destructive testing of trees - 25 years on – Steffen Rust and Josefine Liebisch – Germany



**Wood Material Characterization
Auditorium III**

Moderator: Laurice Spinelli

9:00 – 9:30	ID 257: State-of-Art NIR Technology for wood products – Satoru Tsuchikawa – Japan
9:30 – 10:00	ID 269: Determination of stiffness and strength variability of structural timber by acoustic methods – Ales Straze – Slovenia
10:00 – 10:30	ID 239: Nordmann fir and Noble fir Lamellas for Structural Purposes – Grading and Determination of Elastomechanical Properties by Non-Destructive and Destructive Testing - Katja Fruehwald-Koenig – Germany



10:30 – 11:00	Coffee and Equipment Exhibition - Tent
11:00 – 12:00	Gold Sponsor Space Auditorium II
12:00 – 14:00	Lunch CPV Restaurant

Concurrent Oral sessions - 14:00 – 15:30

Urban Tree Inspection and Risk Analysis Auditorium II Moderator: Vilius Gendvilas	
14:00 – 14:30	ID 254: Urban Tree Root Stability – A Possible New Approach – Lázló Bejó – Hungary
14:30 – 15:00	ID 256: Dynamic Evaluation stability of the standing plane tree in urban area (Farahzad-Tehran) - Shadabeh Fathi – Iran
15:00 – 15:30	ID 249: A method of radar wave tree root detection and parameter estimation based on depth inversion model - Xiaowei Zhang – China



Wood Material Characterization Auditorium III Moderator: Laurice Spinelli	
9:00 – 9:30	ID 243: Elasticity Modules of Pinus Taeda Wood by Destructive and Non-Destructive Tests – Rodrigo Terezo – Brazil
9:30 – 10:00	ID 310: Detection of moisture content in logs using multi-parameter GPR signal analysis and neural network models – Huandong Xu – China
10:00 – 10:30	ID 227: Dynamic indentation test with HardScan®: an effective tool for monitoring railway sleepers quality and performance on track – Adriano W. Ballarin – Brazil



15:30 – 16:00 Coffee and Equipment Exhibition - Tent

Concurrent Poster sessions - 16:00 – 17:00

Urban Tree Inspection and Risk Analysis In-Forest Wood Quality Assessment Auditorium I Moderator: László Béjo	
ID 222:	The Three Underlying Principles in Tree Risk Evaluation – Camila Linhares - Portugal
ID 225:	Impulse tomography as a nondestructive method for assessing the health of Populus nigra L. trees along an urban river - Alexsandro Cunha - Brazil
ID 287:	Enhancing Urban Tree Risk Assessment through LiDAR and Machine Learning - Steffen Rust - Germany
ID 221:	Selection of teak logs using ultrasound wave propagation – Rafael Lorensani - Brazil
ID 293:	Wood density estimation independent of moisture by NIR spectroscopy – Fernanda Ramalho – Brazil
ID 301:	Early Detection of Compression Wood in Pinus taeda for the Selection of Standing Trees – Silvia Böthig - Uruguay
ID 217:	Verification of the growth and wood properties of slash pine (Pinus elliottii) as a fast grown tree - Kiyohiko Ikeda - Japan
ID 255:	Structural Diagnosis of Trees Using Resistography: A Non-Destructive Assessment for Internal Issues Identification – Matheus Barreto Góes, Brazil



**Wood Structure Condition Assessment
Wood Material Characterization
Nondestructive Evaluation of Engineered Wood Products
Auditorium II
Moderator: Monica Ruy**

ID 280: Residual resistance model for wooden poles in electrical distribution networks using non-destructive technology - Julia Sáenz-Baute - Uruguay
 ID 308: A Review of Ground Penetrating Radar on Wood Structures – Brunela Rodrigues - USA
 ID 274: Radial variation of wood density along the trunk of Astronium lecontei (Ducke) trees in eastern Amazon – João Gabriel Leal Martins - Brazil
 ID 209: Prediction of the Strength of Wood Products with Nondestructive Evaluation Techniques — A Review – Laurice Spinelli - USA



**General
Auditorium III
Moderator: Adam Senalik**

ID 224: X-ray densitometry in the evaluation of médium density fiberboard bonded with urea formaldehyde resin and industrial boiler ash - Alexsandro Cunha - Brazil
 ID 233: Quality Journey: ISO 9001 and Benefits Perception in Croatian Wood Companies - Andreja Pirc Barčič - Croatia
 ID 234: Nondestructive evaluation approach: Analysis of quality data information about wood products in retail shops in Croatia - Andreja Pirc Barčič - Croatia
 ID 244: Combined effect of wood temperature and moisture content on drilling resistance measurements - Evgenii Sharapov – Russian Federation
 ID 285: Sugarcane culm radiographs: methodology and potential applications - Gabriel Assis-Pereira - Brazil
 ID 297: Annual tree-rings wood density of Pera glabrata trees trunk occurring in the Cerrado biome applying X-ray densitometry - Gabriel Assis-Pereira - Brazil
 D 245: Multi-feature Fusion-guided Multiscale Bidirectional Attention Networks for Logistics Pallet Segmentation - Zhanguo Wei - China



17:30 Vans departure to the "Bar Giovannetti", Cambuí (Optional Program)
18:00 – 21:00 Cocktail Hour at Bar Giovannetti (optional and on your own)

Friday, September 20, 2024 – CDC/Unicamp

9:00 – 12:00 Registration – Hall Convention Center - Unicamp

Concurrent Oral sessions - 9:00 – 10:30

**Nondestructive Evaluation of Engineered Wood Products
Auditorium I
Moderator: Brunela Rodrigues**

9:00 – 9:30 ID 268: Correlation Between the Visual Quality, Acoustic and Mechanical Properties of the Logs of Four Different Tree Species Collected at a Public Auction of Valuable Logs - Jure Žigon – Slovenia
9:30 – 10:00 ID 284: Pilodyn for Rapid Field Assessment of Decay in Hardwood Trailer Deck Boards Exposed to Deep Tropical Jungle Environments – Xinfeng Xie - USA
10:00 – 10:30 ID 259: The Influence of Fibre Reinforcements to Stability of Oak-Wood Panels Between Different Climates - Vjekoslav Živković – Croatia



In-Forest Wood Quality Assessment Auditorium II Moderator: Ana Paula Coelho-Duarte	
9:00 – 9:30	ID 246: Influence of climate conditions on the propagation velocity of ultrasound waves in forest trees – Cinthya Bertoldo – Brazil
9:30 – 10:00	ID 279: Non-destructive evaluation methods for wood traits in Norway spruce genetics and breeding – Hong T H Nguyen – Vietnam
10:00 – 10:30	ID 220: Machine learning algorithms and non-destructive methods for inference properties of planted forest trees – Rafael G M Lorensani – Brazil



Wood Material Characterization Auditorium II Moderator: Rodrigo Terezo	
9:00 – 9:30	ID 272: Cambium detection in CT scans of green sawlogs for bark and volume quantification – Analytical approaches and methodological difficulties – Udo Sauter – Germany
9:30 – 10:00	ID 271: Small Diameter Oak Logs for Construction – Considerations for Strength Pre-Grading of Green Logs – Udo Sauter - Germany
10:00 – 10:30	ID 253: Preliminary Investigation of Pineapple Crowns for Paper Production - Mojibayo Ikusedun – Nigeria



10:30 – 11:00 Coffee and Equipment Exhibition - Tent

Concurrent Oral sessions - 11:00 – 12:30

Nondestructive Evaluation of Engineered Wood Products Auditorium I Moderator: Brunela Rodrigues	
11:00 – 11:30	ID 230: Impact of time-on-ground of felled pine trees on quality of mass timber - Laya Khademibami - USA
11:30 – 12:00	ID 267: Evaluation of Modulus of Elasticity and Modulus of Rupture of Cross-Laminated Timber with Longitudinal Vibration NDE Techniques - Laurice M S Correa - USA



In-Forest Wood Quality Assessment Auditorium II Moderator: Ana Paula Coelho-Duarte	
11:00 – 11:30	ID 266: Applicability of using the penetrometer as a high-performance tool for wood characterization – Fernanda Guedes – Brazil
11:30 – 12:00	ID 314: Exploring hoop pine (Araucaria cunninghamii) wood properties - Vilijus Gendvilas - Australia



Wood Material Characterization Auditorium III Moderator: Rodrigo Terezo	
11:00 – 11:30	ID 248: Non-destructive evaluation of felled burned logs used as the anti-erosion barriers – Salvatore F Papandrea – Italy
11:30 – 12:00	ID 276: Potential of Seven Brazilian Amazonian Hardwoods for use in Xylophone – Luciano Roitman – Brazil



12:00 – 14:00	Lunch CPV Restaurant
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Auditorium III	
14:00 – 15:00	Urban Tree Inspection and Risk Analysis Moderators: Brunela Rodrigues and Raquel Gonçalves

Workshop Round Table: Results of inspection technologies applying in a tree of the campus of University of Campinas

15:00 – 15:30	Special Session Speaker: Robert Ross
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Conference: Some considerations about the non-contact ultrasonic method and acoustic microscopy for the inspection of wood painted panels of cultural heritage
Author: Voichita Bucur

15:30 – 16:30	Closing Ceremony (Raquel Gonçalves and Robert Ross)
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17:30	Vans departure to the "Buteco do Jair", Barão Geraldo, from CPV Hotel
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18:00 – 21:00	Cocktail Hour at "Buteco do Jair" (optional and on your own)
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Saturday, September 21, 2024

São Paulo city tour (optional and on your own) - 7:00 – 19:00

7:00	Bus departure from CPV Hotel
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9:30 – 12:00	City tour
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12:00 – 14:00	Lunch
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14:00 – 17:00	City tour
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17:00	Departure to Campinas (CPV Hotel)
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