2022 SimCenter Symposium

Texas Advanced Computing Center (TACC)
Advanced Computing Building (ACB, Building 205)
University of Texas at Austin
J.J. Pickle Research Campus
10100 Burnet Rd., Austin, TX 78758

November 3

Working Group Meetings* (open to all)** ***2:00-4:30 pm

Regional Inventory Dev (ACB 2.204)
Regional Earthquake (ACB 1.104)
Regional Hurricane & Tsunami (ACB 1.109)
CFD - Water & Wind (ROC 1.458)
UQ Framework (ROC 1.603)
Socio-Economic Impacts (ACB 1.104)

Poster Session & Welcome Reception ***4:30-6:00 pm***

Main Foyer

November 4 Detailed Agenda

Time (CDT)	Event	Location (Session Chair)
8:00 am	Buffet breakfast	Main Foyer
8:30	Welcome *Sanjay Govindjee*	Auditorium: ACB 1.102
8:40	NSF Welcome *Joy Pauschke*	Auditorium
8:50	Enabling Multi-Disciplinary Research in Natural Hazards Through Data and Simulation *Greg Deierlein* *Ellen Rathje*	Auditorium
9:30	**Session 1: Technical Plenary** Lightning Talks	Auditorium (Sanjay Govindjee)
10:30	Break	
10:50	**Session 2: Technical Sessions**	
	2A: Computational Fluid Dynamics for Wind/ Waves/Surge/Tsunami induced Load Effects	ROC 1.468 (Ahsan Kareem)
	2B: Uncertainty Quantification in Natural Hazard Engineering	ACB 1.104 (Joel Conte)
	2C: Data and Simulation Advances for Coastal Risk Assessment	ACB 2.204 (Tracy Kijewski-Correa)
	2D: Simulation Advances for Seismic Response Assessment	Auditorium (Greg Deierlein)
	2E: Regional Risk and People	ROC 1.900 (Rachel Davidson)
12:20 pm	Lunch	

1:10	**Session 3: Technical Sessions** 3A: Wind and Water Induced Loading and Damage 3B: Model Updating and Dimensionality Reduction in UQ 3C: Structural Performance Assessment 3D: Regional Risk Assessment 3E: Regional Metadata Inventories for Engineering Applications	 Auditorium (Guirong Yan) ACB 2.204 (Alex Taflanidis) ACB 1.104 (Adam Zsarnóczay) ROC 1.900 (Michael Motley) ROC 1.468 (Ertugrul Taciroglu)
2:40	Break	
3:00	**Session 4: Technical Plenary**	Auditorium (Laura Lowes)
4:10	**Wrap-up Plenary** *Sanjay Govindjee* *Greg Deierlein*	Auditorium
4:30	**Closure**	

Session 1 (9:30 – 10:30) Lightning Talks

Authors	Title
Carlos Molina Hutt	Analytical framework to assess earthquake-induced downtime and model recovery of buildings
Caroline Williams	A SimCenter Opportunity: Integrating a Dynamic Building Inventory for Regional Natural Hazard Simulation Modeling
Rodrigo Costa	Regional Housing Recovery Simulations as a Tool to Inform Pre-disaster Planning
Wenyang Zhang	Regional-scale seismic fragility, loss, and resilience assessment using physics-based simulated ground motions: an application to Istanbul
Alex Taflanidis	Improving the computational efficiency of seismic building-performance assessment through reduced order modeling and multi-fidelity Monte Carlo techniques
Seymour Spence	Metamodeling by Deep Learning of Nonlinear Structural Systems Subject to Extreme Natural Hazards
Megan Hart	Preparing for the Storm: Managing Risk Using Catastrophe Models
Ahsan Kareem	Simulation of Wind Effects on Buildings in Cityscapes

Session 2 (10:50 – 12:20)

Track	Topic (Room)	Speaker	Title
2A	Computational Fluid Dynamics for Wind/Waves/ Surge/Tsunami induced Load Effects (ROC 1.468)	Fei Ding	Digital Wind Tunnel for Wind Load Assessment of Structures
		Chao Sun	High-Resolution High-fidelity modeling of Hurricane Winds and Its Application in Energy Infrastructure Systems
		Teng Wu	Embedded Large Eddy Simulation of Wind Loads on High-Rise Buildings in Urban Areas
		Abiy Melaku	A high-fidelity fluid-structure interaction framework for computational aeroelastic modeling of flexible structures
		Guirong Yan	High-fidelity CFD Simulation of Tornado-Structure Interaction
2B	Uncertainty Quantification in Natural Hazard Engineering (ACB 1.104)	Raul Rincon	Traditional and surrogate-based procedures for fragility functions derivation and their influence on network analysis
		Arthriya Subgranon	Uncertainty quantification of data-driven stochastic wind load models for application in performance-based wind engineering
		Seymour Spence	Metamodeling by Deep Learning of Nonlinear Structural Systems Subject to Extreme Natural Hazards
		Ziqi Wang	Optimized equivalent linearization for random vibration
		Alex Taflanidis	Improving the computational efficiency of seismic building-performance assessment through reduced order modeling and multi-fidelity Monte Carlo techniques
2C	Data and Simulation Advances for Coastal Risk Assessment (ACB 2.204)	Patrick Lynett	Real-Time Simulation and Interactive Visualization of Coastal Hazards
		Aikaterini Kyprioti	Coastal vegetation impact on structural vulnerability
		Gaby Ou	Open Access Data Generation Engine for Electrical Transmission Power System under Extreme Windstorms
		Mehrshad Amini	Development of Casualty Model for IN-CORE using Seaside Testbed: Life Safety Risk of Nearfield Earthquake and Tsunami
		Megan Hart	Preparing for the Storm: Managing Risk Using Catastrophe Models

2D	Simulation Advances for Seismic Response Assessment (Auditorium)	Kuanshi Zhong	Using Probabilistic Learning on Manifolds (PLoM) for Surrogate Modeling of Seismic Response of Building Structures
		Carlos Arteta	RC-FIAP - Reinforced Concrete Frame Inelastic Analysis Platform
		Laura Lowes	Using SimCenter Software and NHERI Resources to Calibrate an OpenSees Model for Reinforced Concrete Walls
		James Ricles	Multi-Natural Hazards Performance Assessment of Structural Systems with Soil-Foundation Structure Interaction using Real-time Hybrid Simulation with Machine Learning-Trained Neural Networks
		Floriana Petrone	Assessing the Seismic Risk to RC Buildings in the San Francisco Bay Area Using ASCE/SEI 7-Compliant Methods with the Use of Real and Simulated Ground-Motion Records
2E	Regional risk and people (ROC 1.900)	Rodrigo Costa	Regional Housing Recovery Simulations as a Tool to Inform Pre-disaster Planning
		Nikola Blagojevic	Integrating advanced building recovery models into regional recovery simulations
		Chao Fan	Data-Driven Models Integrate Human Mobility into Design of Equitable and Resilient Urban Facilities
		Maria Koliou	Community resilience assessment and decision making via Agent-Based Modeling (ABM)
		Samiul Hasan	Understanding the Influence of Multiple Information Sources on Risk Perception Dynamics and Evacuation Decisions: An Agent-based Modeling Approach
		Pallab Mozumder	Extreme Weather Events and the Performance of Critical Utility Infrastructures: A Case Study of Hurricane Harvey

Session 3 (1:10 – 2:40)

Track	Topic (Room)	Speaker	Title
3A	Wind and Water Induced Loading and Damage (Auditorium)	Miguel Cid Montoya	Harnessing SimCenter tools for the aero-structural optimization of long-span bridges
		Rathinam Selvam	Peak pressure computation on a building using inflow turbulence generators
		Mohamed Moustafa	Probabilistic assessment of SAC building nonlinear response under extreme wind loads through collapse
		Mohammad Alam	Physical and Numerical Modeling of Damage of Elevated Light-frame Wood Building due to Hurricane Overland Surge and Waves
		Yanlin Guo	Modeling of fragility of urban building envelopes subjected to windborne debris impact
		Liang Cao	3D Real-time Hybrid Wind Simulation of a Tall Building with a Novel Tuned Mass Friction Damper and Real-time Model Updating

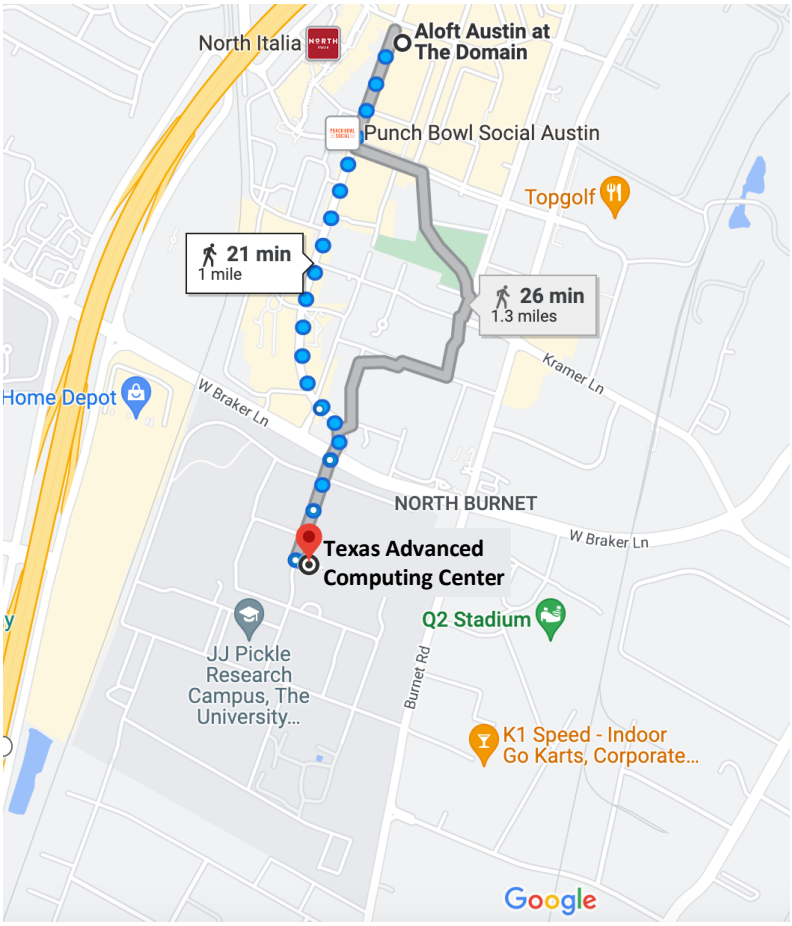
3B	Model Updating and Dimensionality Reduction in UQ (ACB 2.204)	Faisal Nissar Malik	3D Real-time Hybrid Simulation of Systems with Physics-Based Machine Learning Model Updating
		Michael Shields	Manifold learning for high-dimensional uncertainty quantification
		Maitreya Manoj Kurumbhati	Hierarchical Bayesian Inference for Uniaxial Reinforcing Steel Model Parameters
		Weiwei Zhan	Quantifying epistemic uncertainty for global geospatial liquefaction models
		Pedro Arduino	Sensitivity analysis and Bayesian calibration of a constitutive soil model using quoFEM
3C	Structural Performance Assessment (ACB 1.104)	Carlos Molina Hutt	Analytical framework to assess earthquake-induced downtime and model recovery of buildings
		Kyaw Htet Win	F-Rec Framework for probabilistic evaluation of functional recovery of building systems and its interface with the PELICUN
		Adam Zsarnóczay (Anne Hulsey)	Designing to limit uncertainty in post-earthquake functional recovery time
		Francisco Galvis	High-fidelity loss assessment of a portfolio of existing tall buildings using SimCenter tools
		Tamika Bassman	Advancements in multi-hazard risk analysis for portfolio-level assessments
3D	Regional Risk Assessment (ROC 1.900)	Fernando Szasdi Bardales	Synergistic Integration of Wildfire Models to Simulate Fire Spread in the Wildland Urban Interface
		Wenyang Zhang	Regional-scale seismic fragility, loss, and resilience assessment using physics-based simulated ground motions: an application to Istanbul
		Jack Baker	Spatial Correlations in Ground Motion Intensity: Measurement and Use for Regional Risk Analysis
		Finn Scheele	RiskScape: A flexible multi-hazard risk modelling platform
		Kristen Blowes (Preetish Kakoty)	Multi-Scale Regional Seismic Risk Modeling using SimCenter's Regional Resilience Determination (R2D) Tool
		Neetesh Sharma	Modeling Societal Impacts of Natural Hazards
3E	Regional Metadata Inventories for Engineering Applications (ROC 1.468)	Joseph Wartman	The Covid-19 Seattle Street View Campaign
		Caroline Williams	A SimCenter Opportunity: Integrating a Dynamic Building Inventory for Regional Natural Hazard Simulation Modeling
		Ali Mostafavi	Harnessing community-scale big data and AI to augment resilience
		Barbaros Cetiner	Image-Based Inventory Generation for Evaluating Regional-Level Effects of Natural Hazards
		Jeffrey Berman	Constructing a High-Resolution, Georeferenced 3D Model of a Coastal Washington City for Tsunami Planning
		Stella Yu	Minimal Active Machine Learning for Scientists and Engineers

Session 4 (3:00 – 4:10)

Speaker	Title
Barbara Simpson	Early career experiences with SimCenter and DesignSafe educational and research tools
Ashley Hoke	HAZUS Inventory Developments that Facilitate High Resolution, Regional Research
Rachel Davidson	Simulation modeling to support government policy-making for regional disaster resilience
Tracy Kijewski-Correa	Advancing Parcel-Level Hurricane Regional Loss Assessments Using Open Data and the Regional Resilience Determination Tool

Poster Session (Nov 3, 4:30 – 5:30)

Presenter	Title
Carmen Andrade	Comparative Study of Surrogate Model Methods for Predicting Seismic Structural Response
Tarak Aziz	Spatial Analysis of Flood risk through hydrodynamic modelling and exploring steps for flood risk reduction
Carlos Del-Castillo-Negrete	Efficient and Reproducible HPC Simulations for Storm Surge Modeling
Barbaros Cetiner	SimCenter's Building Recognition using AI at Large Scale (BRAILS) Software
Fei Ding	SimCenter's Wind Engineering with Uncertainty Quantification (WE-UQ) Tool
Sasan Dolati	Evaluating the Effect of Loading Protocol on the Strength and Deformation Capacity of Reinforced Concrete Columns
Mitchell Givens	Evaluation of Brooklyn Storm Shelter Capabilities to Meet the Needs of Vulnerable Populations
Jingwen He	Simulation-based Analysis of Earth Dam Performance under Region-Specific Earthquake Ground Motions
Haitham Ibrahim	Fragility and Experimental Investigation for Hurricane-Induced Wind Loads of Elevated Coastal Houses
Stevan Gavrilovic	SimCenter's Regional Resilience Determination (R2D) Tool
Davide Noè Gorini	Thinking about seismic-resistant soil-structure systems: from advanced numerical modelling to design methodologies
Juan Miguel Navarro Carranza	Simulating ductile fracture due to low-cycle fatigue on reinforced concrete walls.
Hongrak Pak	Knowledge Transfer-enhanced LSTM Model to Predict the Structural Dynamic Response
Emily Ping	Comparison of Material Model Calibration Methods Using Response Predictions from Component Model
Michael Whiteman	An efficient application of supercomputer resources for machine learning, a case study: damage identification of a five-story reinforced concrete structure
Sang-ri Yi and Aakash Bangalore Satish	SimCenter's Quantified Uncertainty and Optimization for the Finite Element Method (quoFEM) Application
Jinyan Zhao	Regional probabilistic assessment of excavation induced structural damage using Monte-Carlo method and finite element models
Kuanshi Zhong	SimCenter's Earthquake Engineering with Uncertainty Quantification (EE-UQ) Application
Adam Zsarnóczay	SimCenter's Performance Based Engineering Application



Parking on the Pickle Research Campus
To get to the Advanced Computing Building (ACB, Building 205) from the **Braker Lane** entrance, ACB is the second building on the left with the overhanging patios.

From the **Burnet Road** entrance, continue past the guard booth (you don't need to stop), and past the chain link gate to Exploration Way, then make a right. ACB is the second to last building on the right with the overhanging patios.

When you arrive at ACB, you may park in the covered parking lot or on the street. **Please obtain a parking pass from one of the kiosks, or you may use the ParkMobile app (zone 96113).** Please check in with the receptionist when you enter the building.