Bridge Engineering & Evaluation

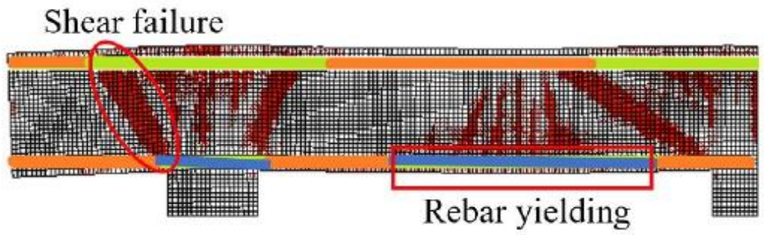
- Inspection, evaluation, and load rating
- Nondestructive testing methods
- Shear behavior and strut-and-tie modeling
- Refined analysis methods

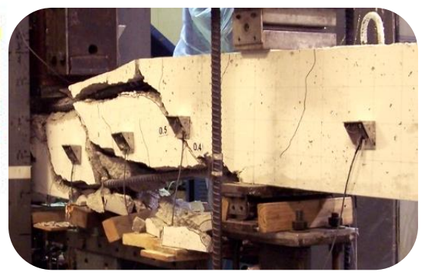
Evaluation under Extreme Loads

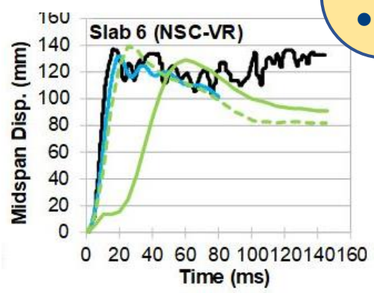
- Impact and Blast loads
- High strain rate mechanics
- Computational simulations
- Verification and validation (V&V)

Computer Tools and Software Development for Implementation

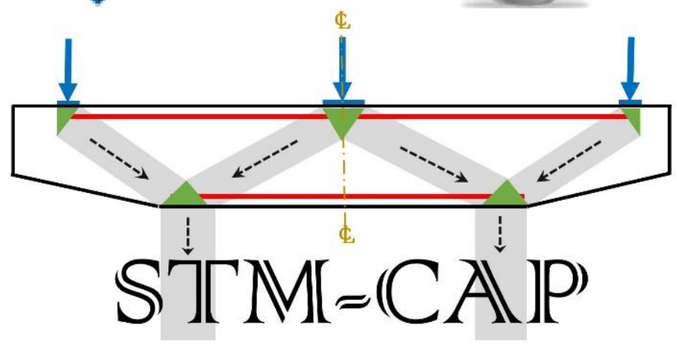
- VecTor5 & Janus for nonlinear FEA
- STM-CAP for pier cap modeling
- ANN-Anchors; ANN-Customize
- Fragility Generator
- Equivalent Cone Method





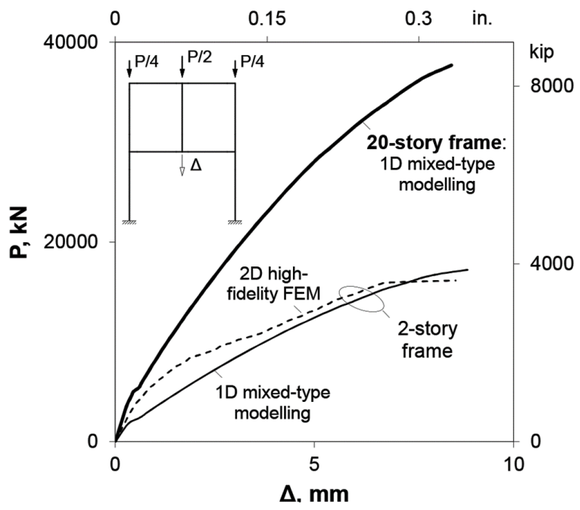


VecTor5 FormWorks+ Janus



Performance-Based Engineering for Natural Hazard Resilience

- Mixed-type and high-fidelity modeling
- Shear behavior and cracking
- Post-peak response and ductility
- Sustainability and life cycle aspects



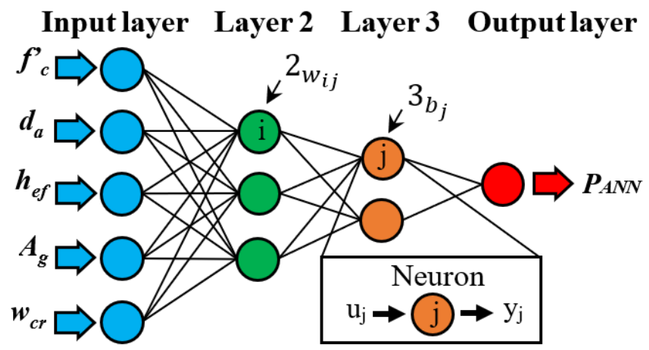
REsilient & Sustainable InfraStrucTure

RESIST Group

Bridge Engineering, Numerical Modeling & Experimental Validation

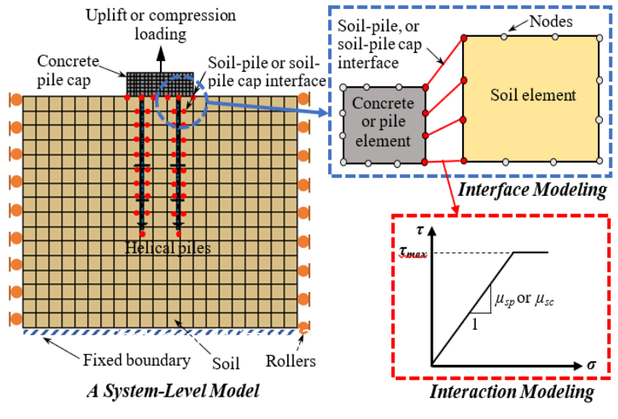
Machine Learning

- Artificial neural networks
- Supervised and unsupervised models in computational mechanics



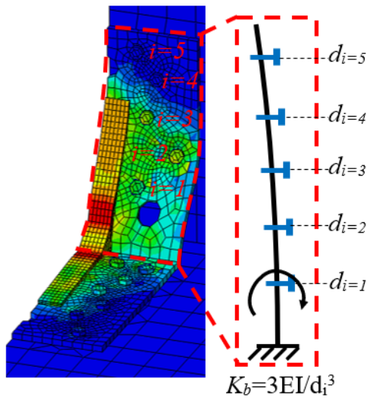
Foundations and Anchorage

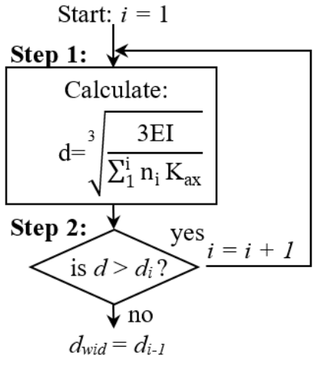
- Pile-to-pile cap connections
- Response to uplift loads
- Foundations for energy and telecommunication infrastructure
- Foundations for dynamic equipment
- Strengthening and upgrade



Cross Laminated Timber

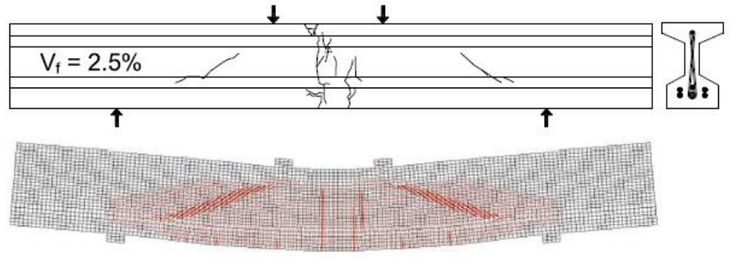
- Out of plane behavior
- Wall-to-floor/foundation connections
- Response to earthquake and tsunami loads
- Life cycle assessment





Ultra-High-Performance Concrete

- Constitute model development
- Cracking and crack spacing formulation
- Strain-hardening and -softening mixes
- Members with no shear reinforcement



https://www.utoledo.edu/engineering/faculty/serhan-guner