



Thammasat University



Advancing Earthquake Resilience through Low-Cost Smart Sensing

From Real-Time SHM to Regional Strong Motion Networks

Start



SPEAKER'S PROFILE



Earthquake Research Center of Thailand

Ms. Kyawt Tin Zar Ko

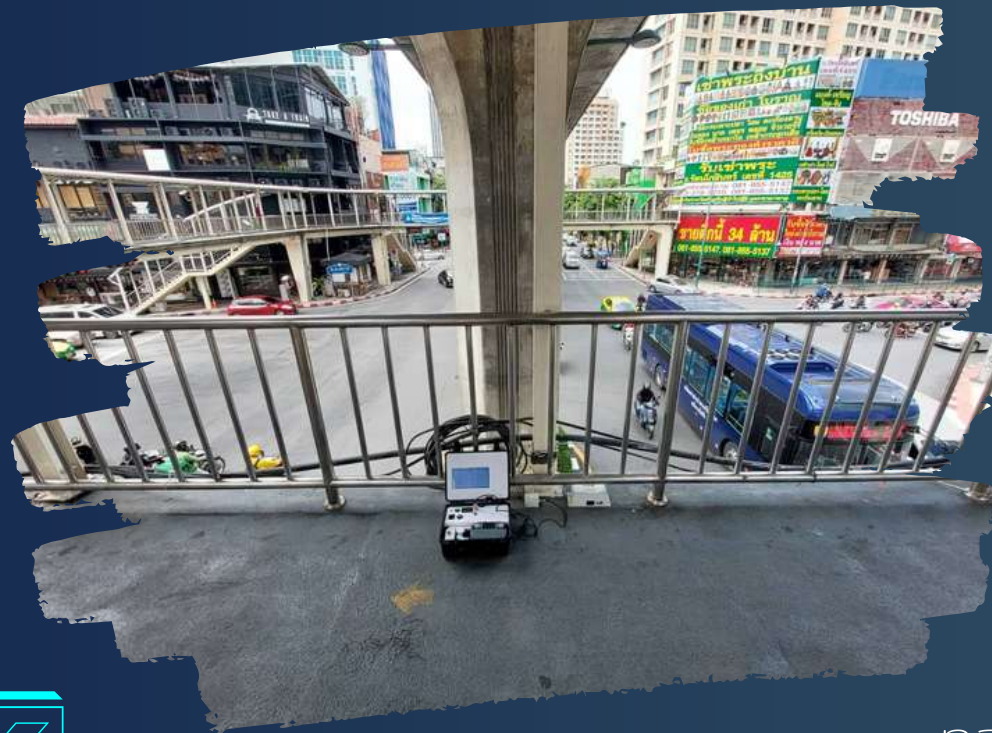
- Research Assistant
- PhD Candidate, Department of Structural Engineering
- Thammasat School of Engineering
- Structural Engineering, Earthquake Engineering, Structural Health Monitoring





THE CHALLENGE WE ADDRESS

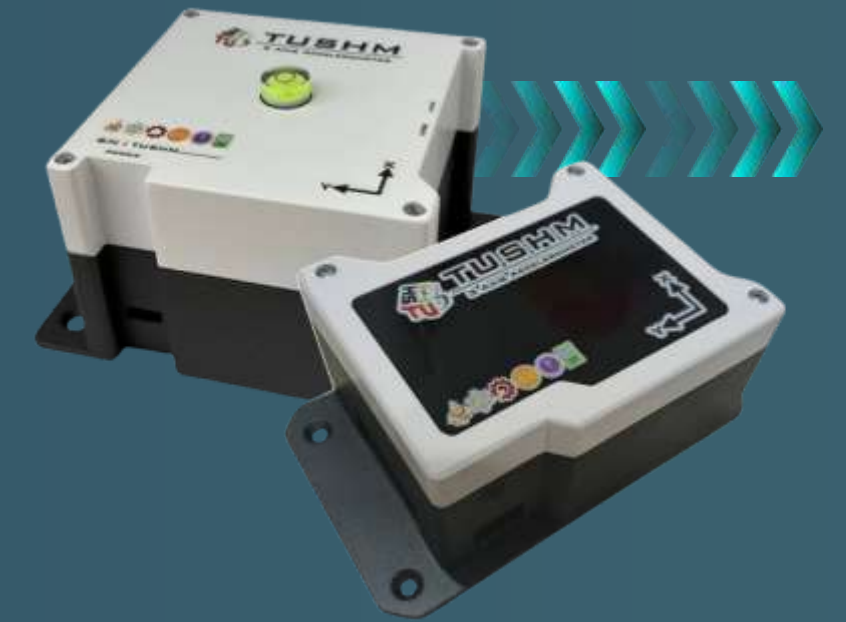
- **Growing Concerns:** Increased vibrations from traffic, construction, and industrial machinery threaten structural integrity.
- **Current Limitations:**
 - Existing sensors are expensive and overly complex.
 - Limited customization options; users face restricted data access and complex software.
- **Market Opportunity:**
 - A clear demand for **affordable, precise, and easy-to-use** vibration monitoring systems.





TUSHM

Affordable, High-Precision Vibration Measurement



- Developed by a research team from Thammasat University, Thailand
- Focused on structural engineering, earthquake engineering, and vibration analysis
- 4 years of research and developed and international/domestic recognition
- Visit our website
 - <https://tu-shm.com>



- Assist. Prof. Dr. Amorntep Jirasakjamroonsri
- Faculty of Science and Technology
- Structural Engineering, Earthquake Engineering, Structural Health Monitoring



- Prof. Dr. Nakhorn Poovarodom
- Thammasat School of Engineering
- Structural Engineering, Earthquake Engineering, Structural Health Monitoring

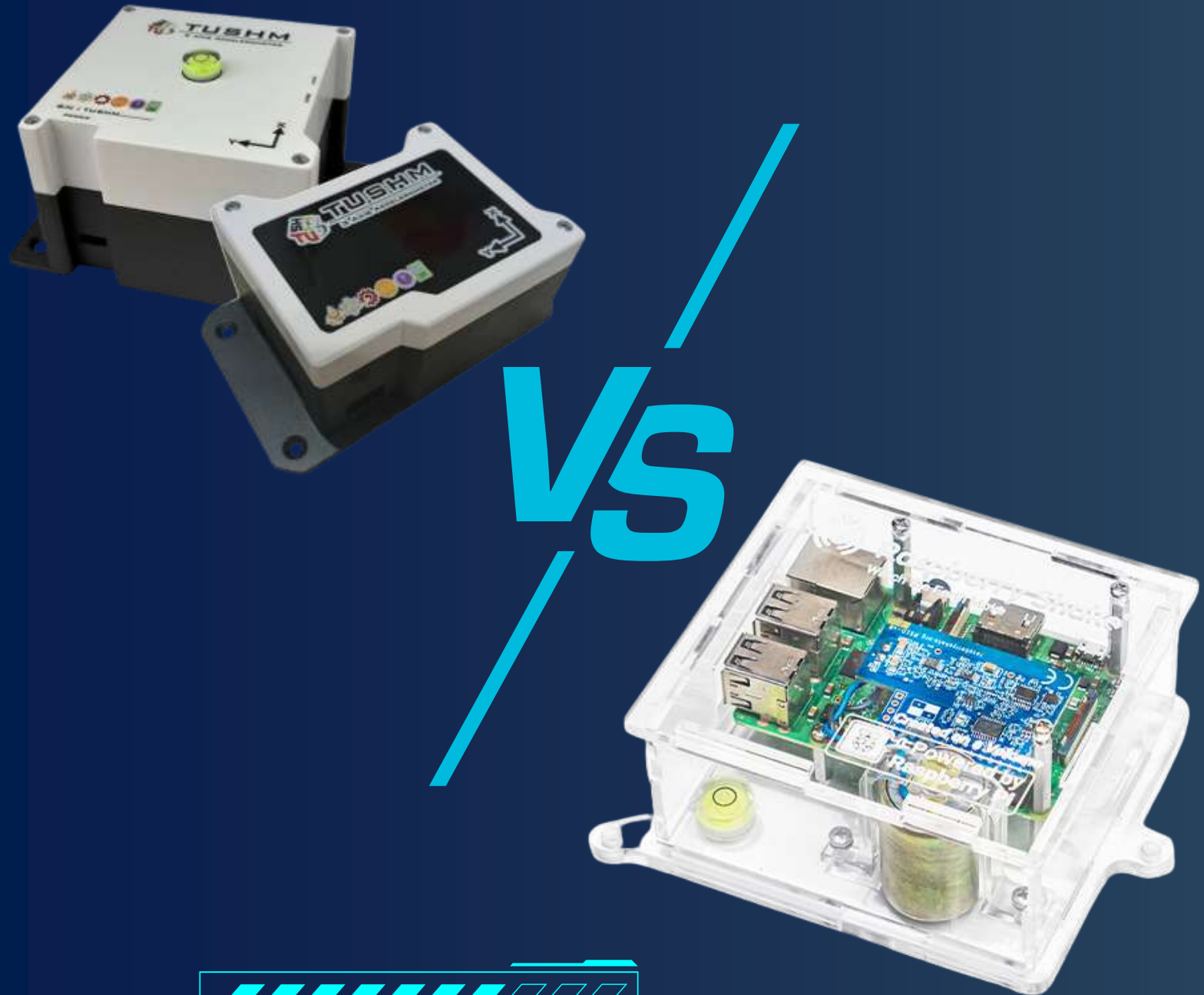


- Prof. Dr. Pennung Warnitchai
- Asian Institute of Technology
- Structural Engineering, Earthquake Engineering, Structural Health Monitoring





HIGH-PRECISION, COST-EFFECTIVE TECHNOLOGY

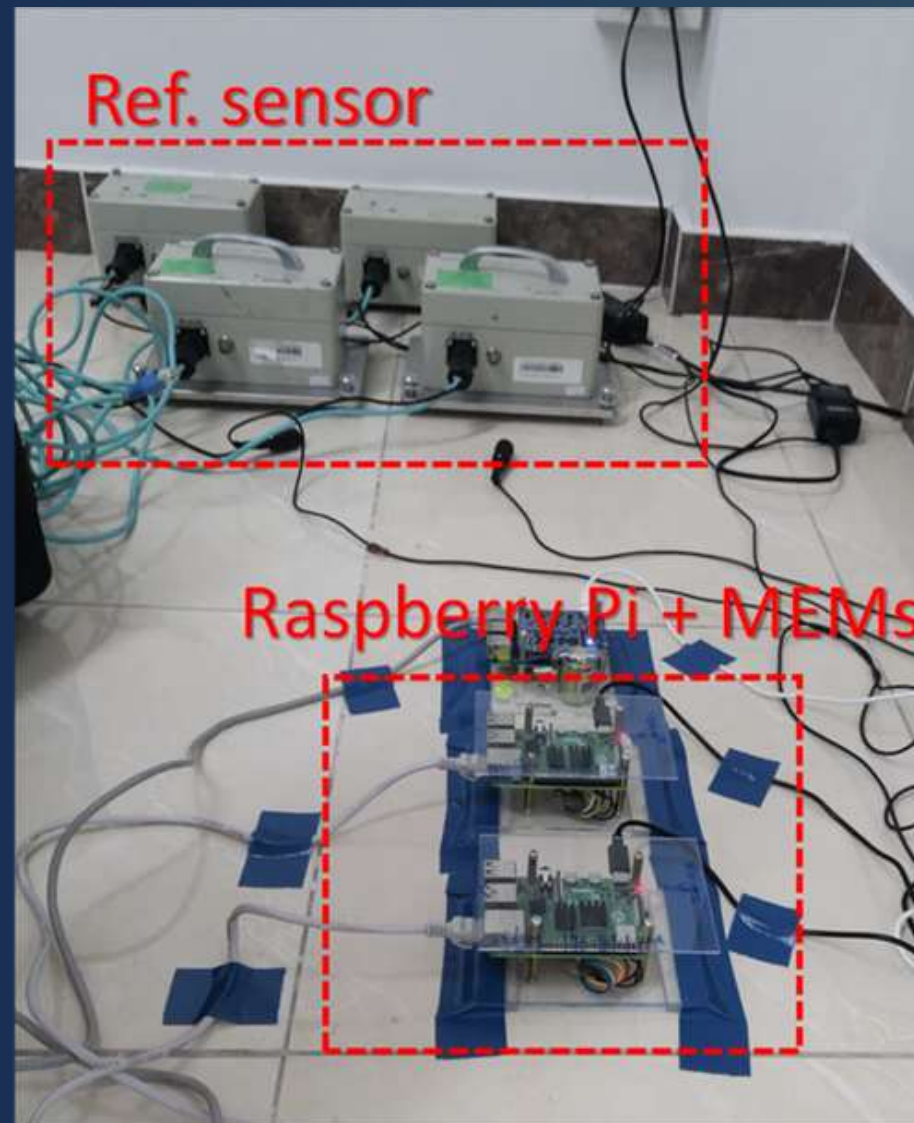
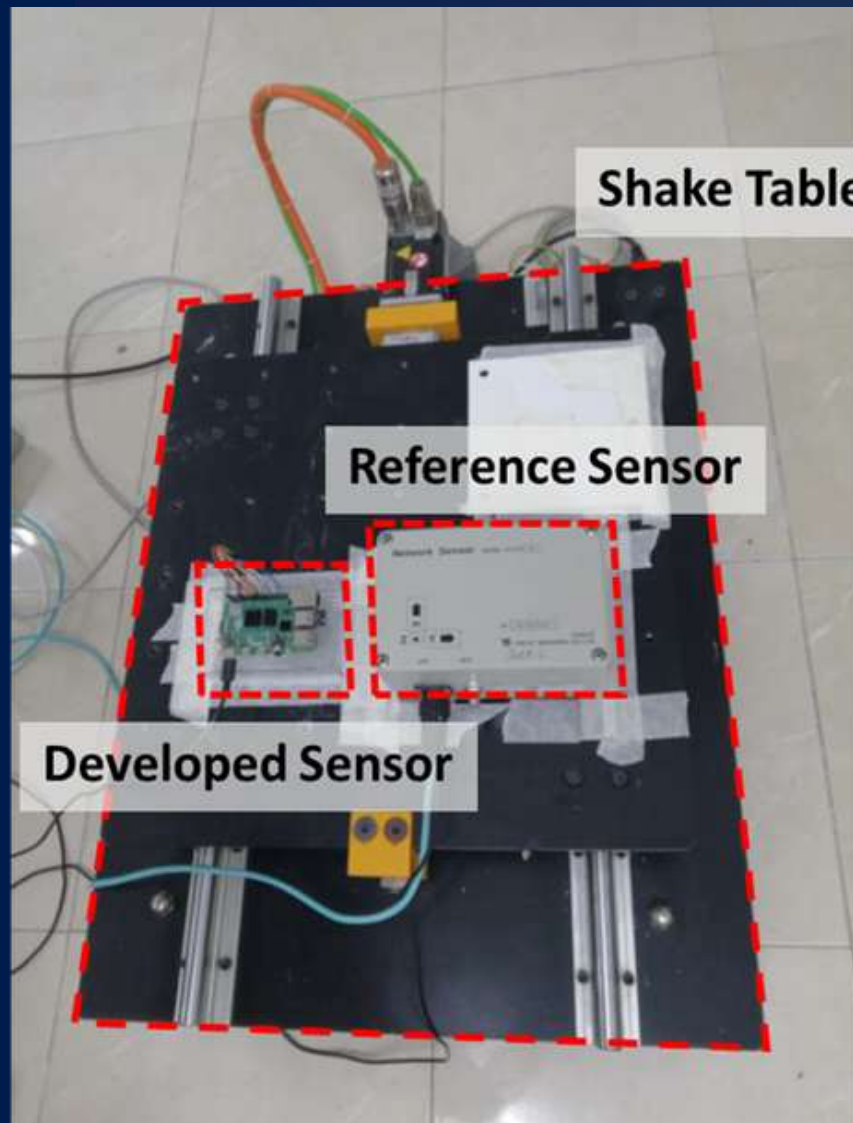


Model	TUSHM	RS4D
Component	Tri-axial	Tri-axial
Sampling Rate	100 Hz	100 Hz
Full Scale Range	±2 g	±2 g
Noise Level	0.2 milli-g	0.3 milli-g
Unit Cost	~500 USD	~800 USD





TUSHM SMART VIBRATION MONITORING SYSTEM





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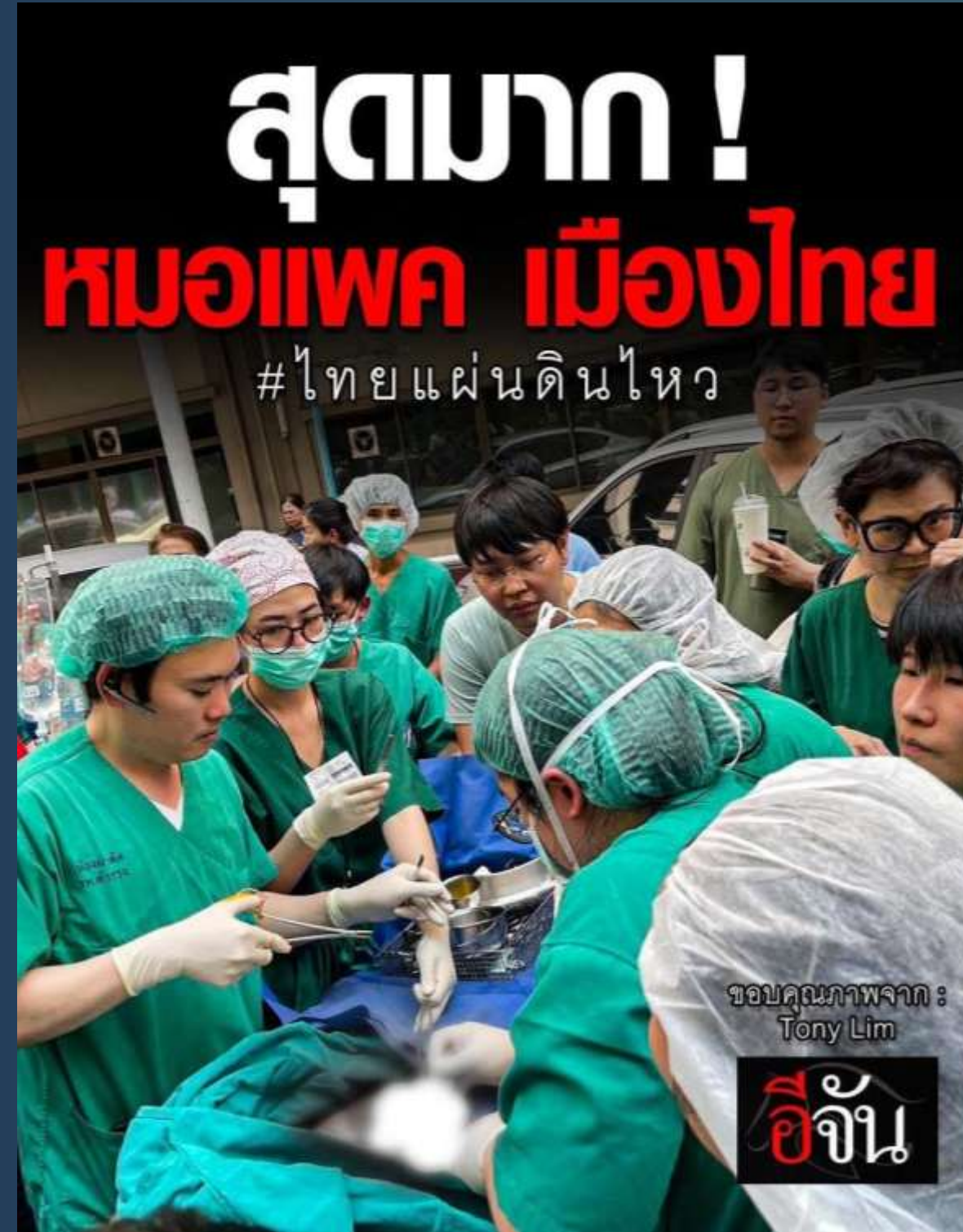


Low-Cost Smart Sensing : Application (1)

Real-Time Structural Health Monitoring System

Start







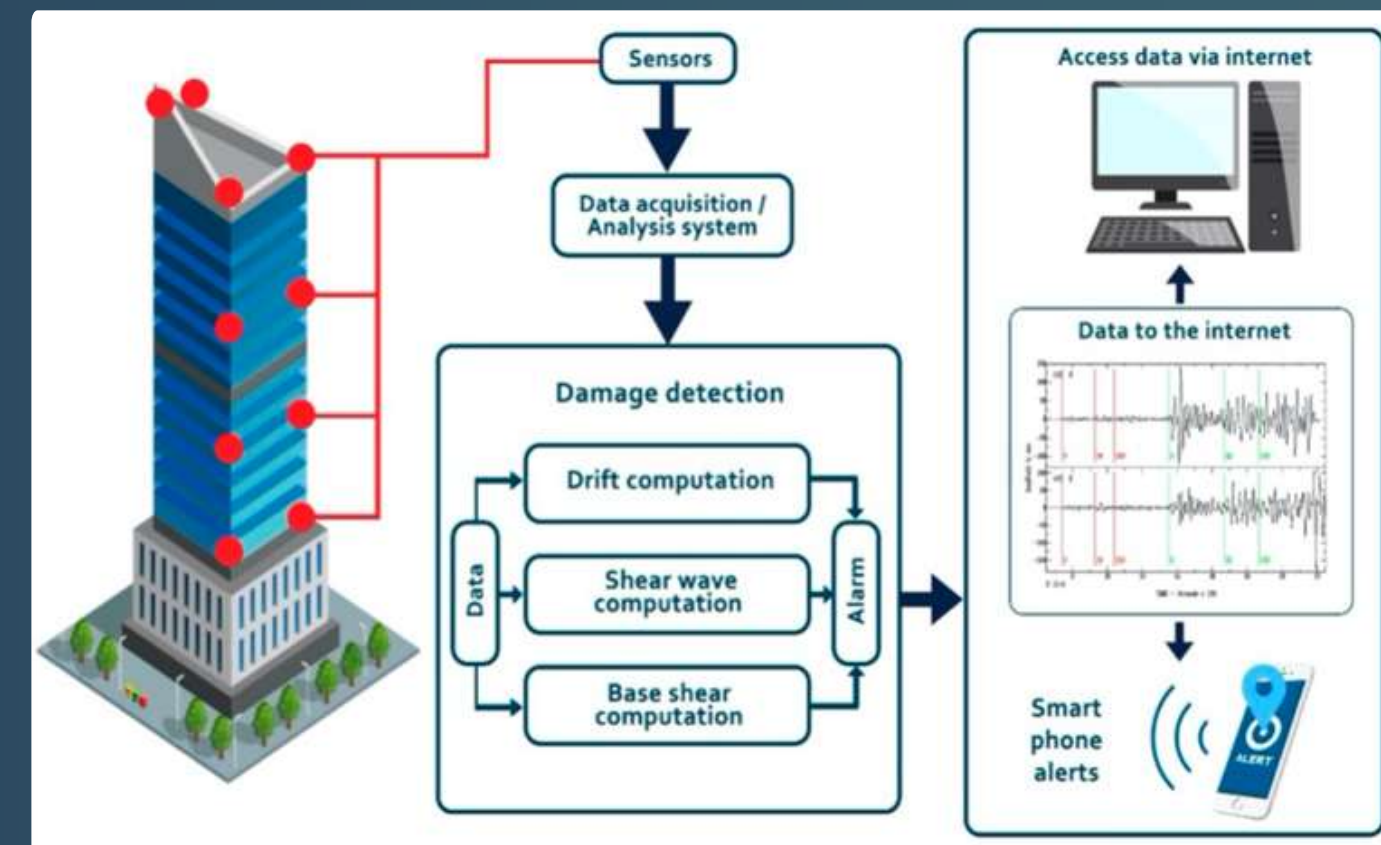
STRUCTURAL HEALTH MONITORING



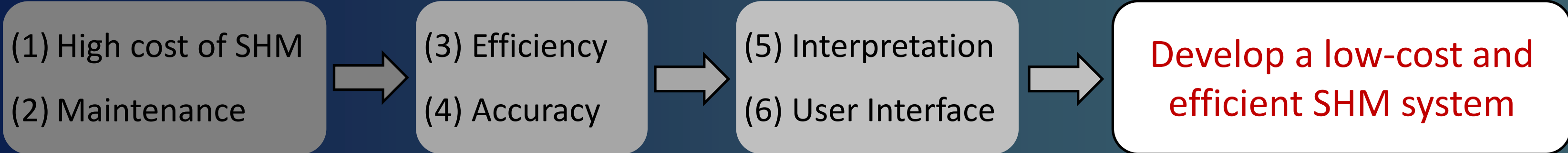
Continuous monitoring and assessing performance of the structure

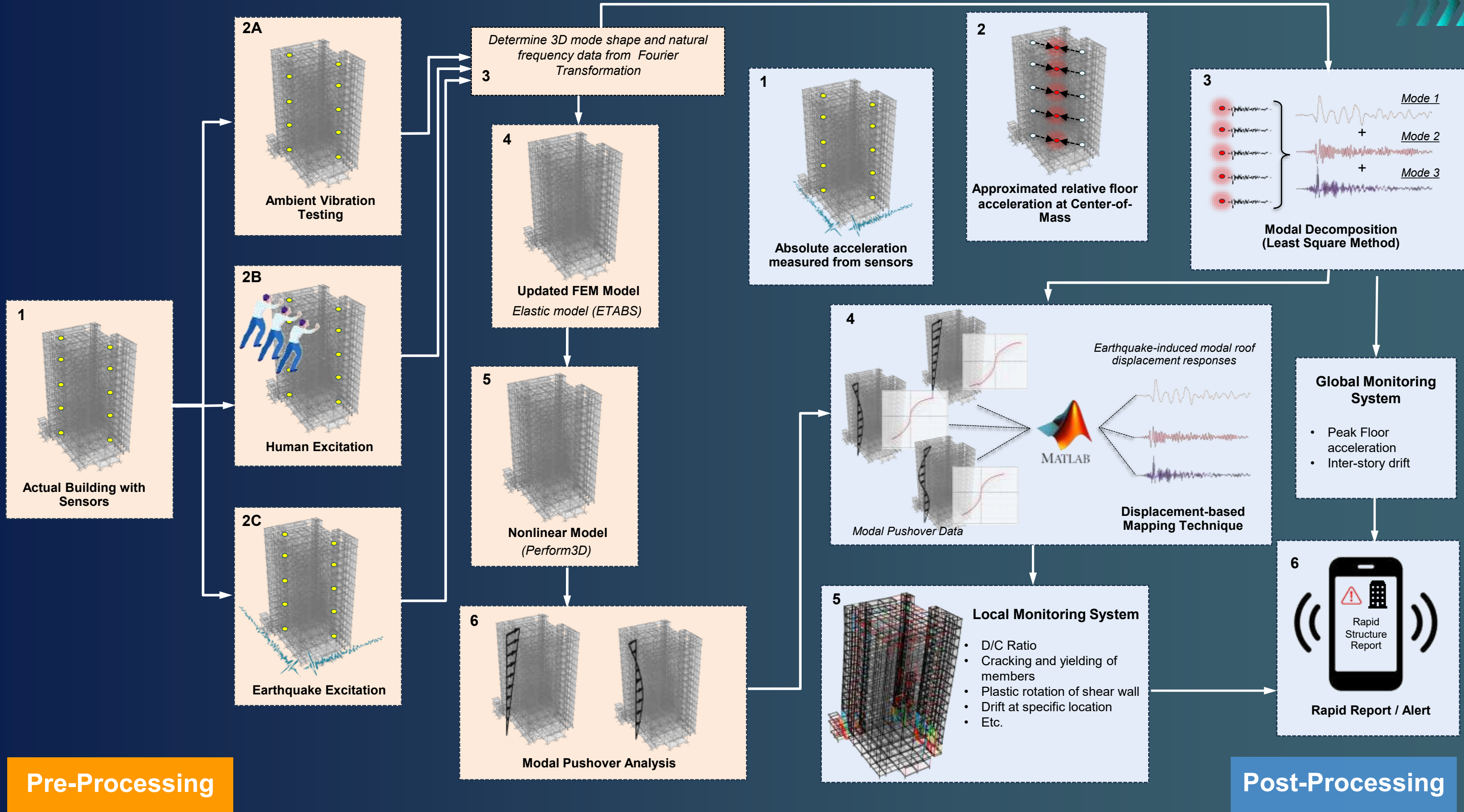


Warning in the event of strong vibration



<https://www.mdpi.com/2075-5309/11/6/263>





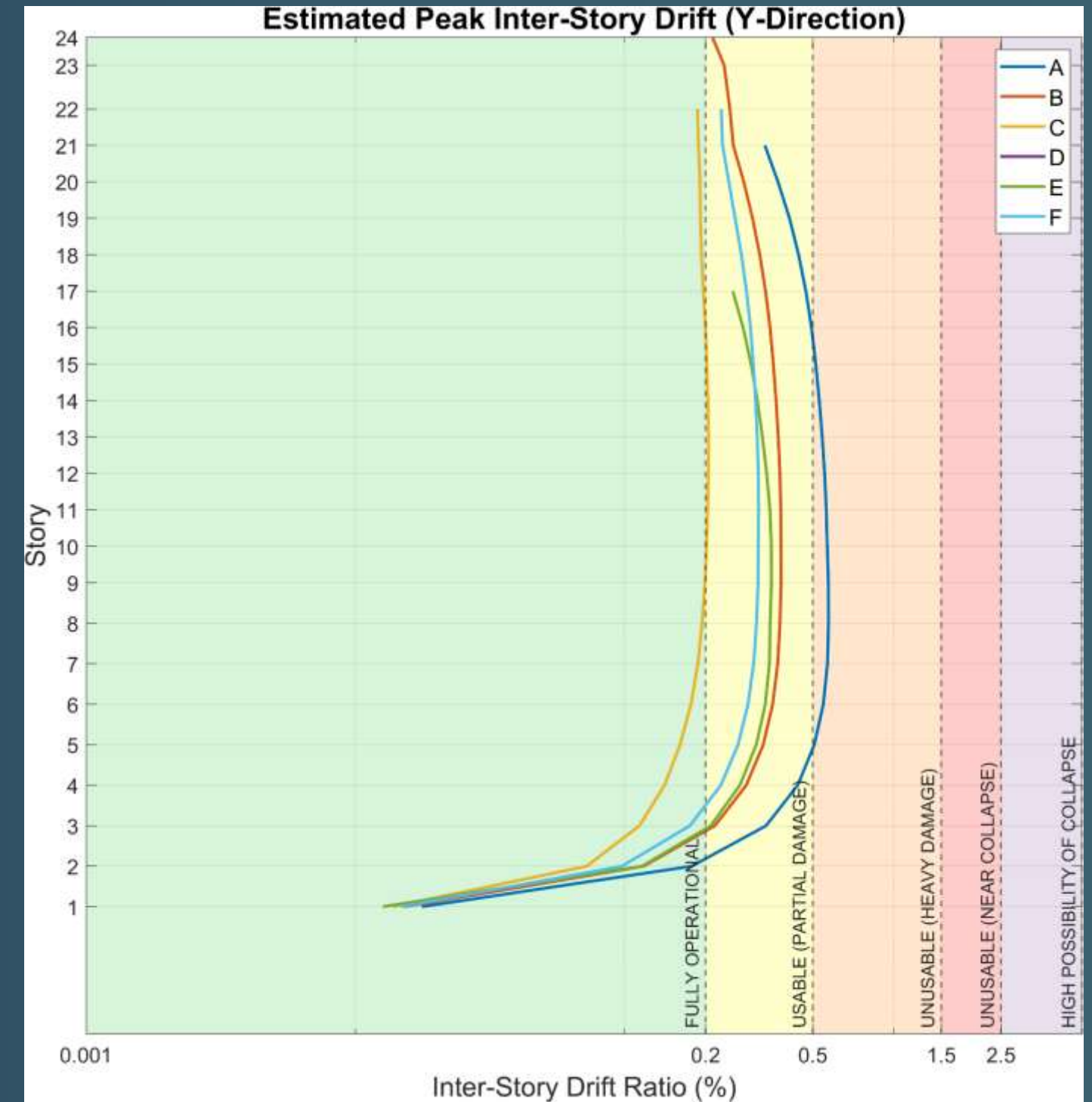
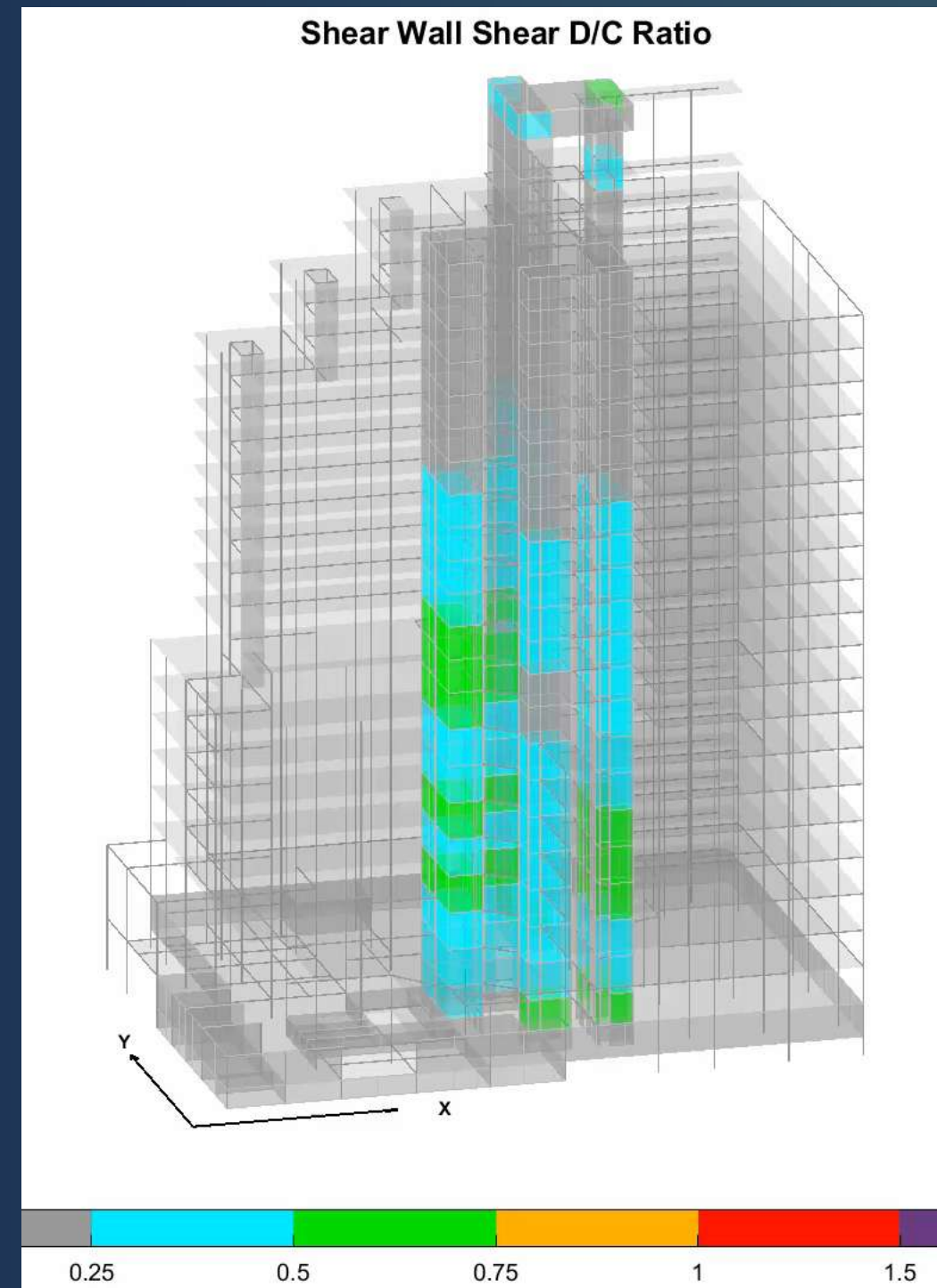
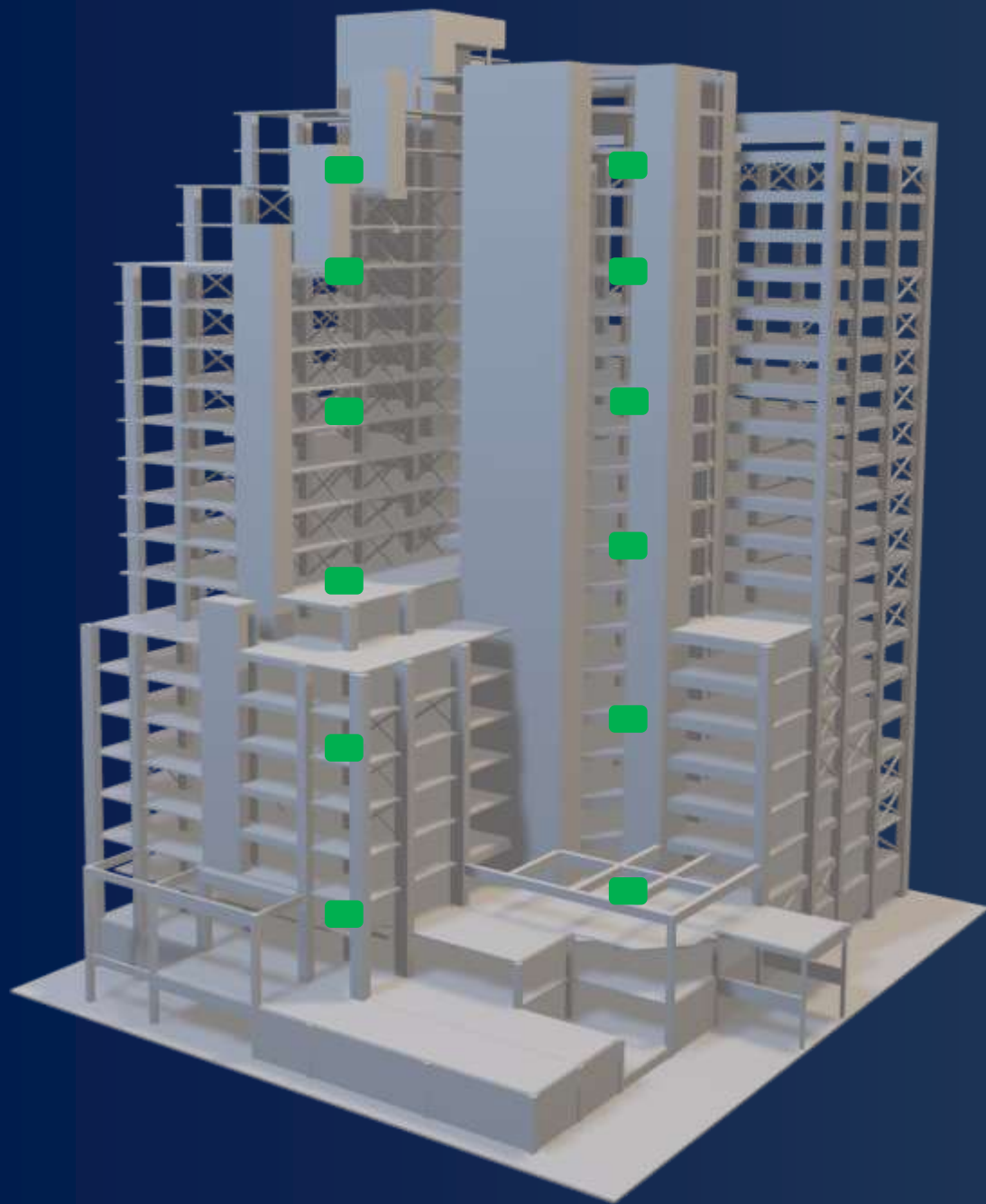
Pre-Processing

Post-Processing





STRUCTURAL HEALTH MONITORING





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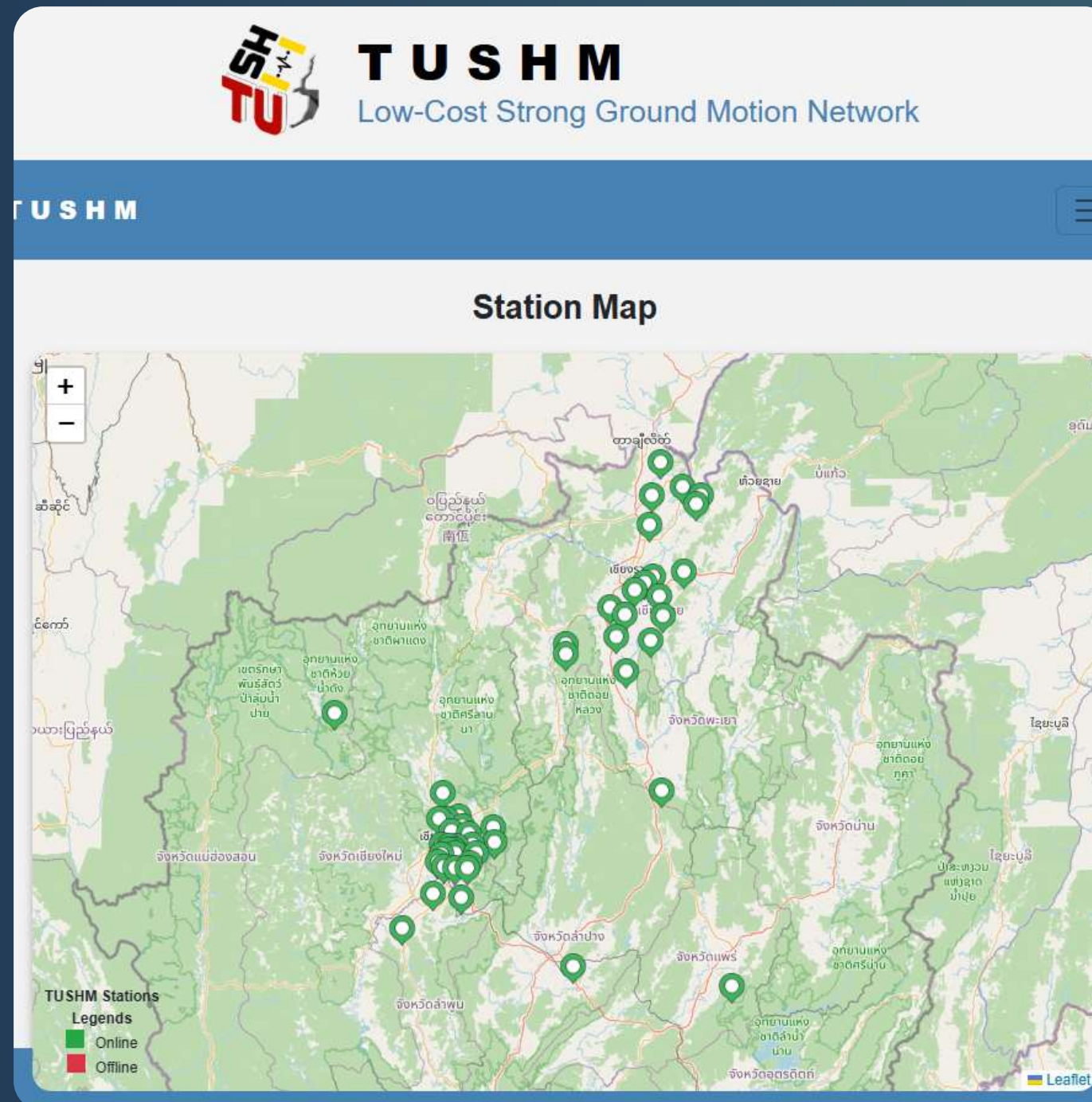
Low-Cost Smart Sensing : Application (2)

Regional Strong Motion Network

Start

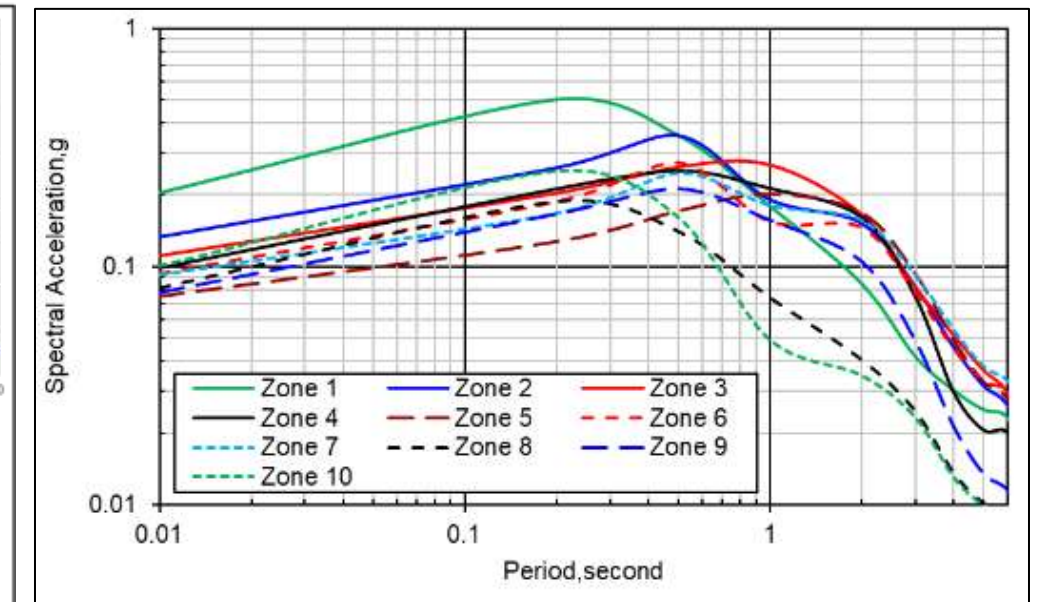
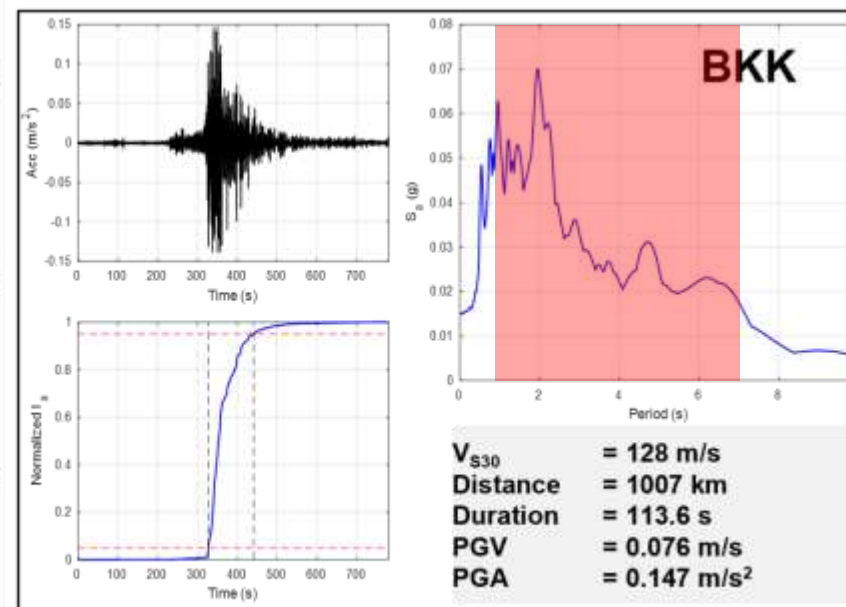
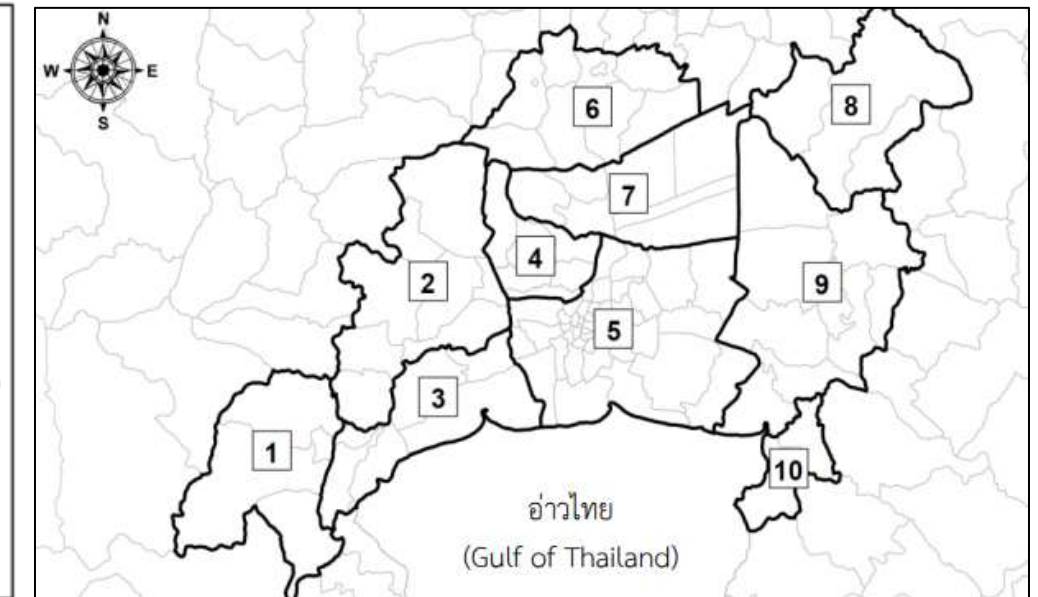
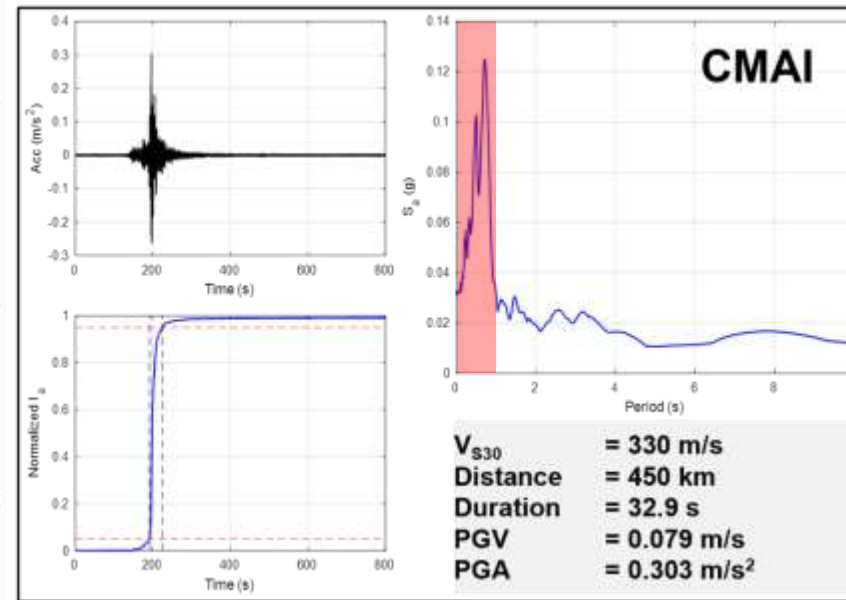
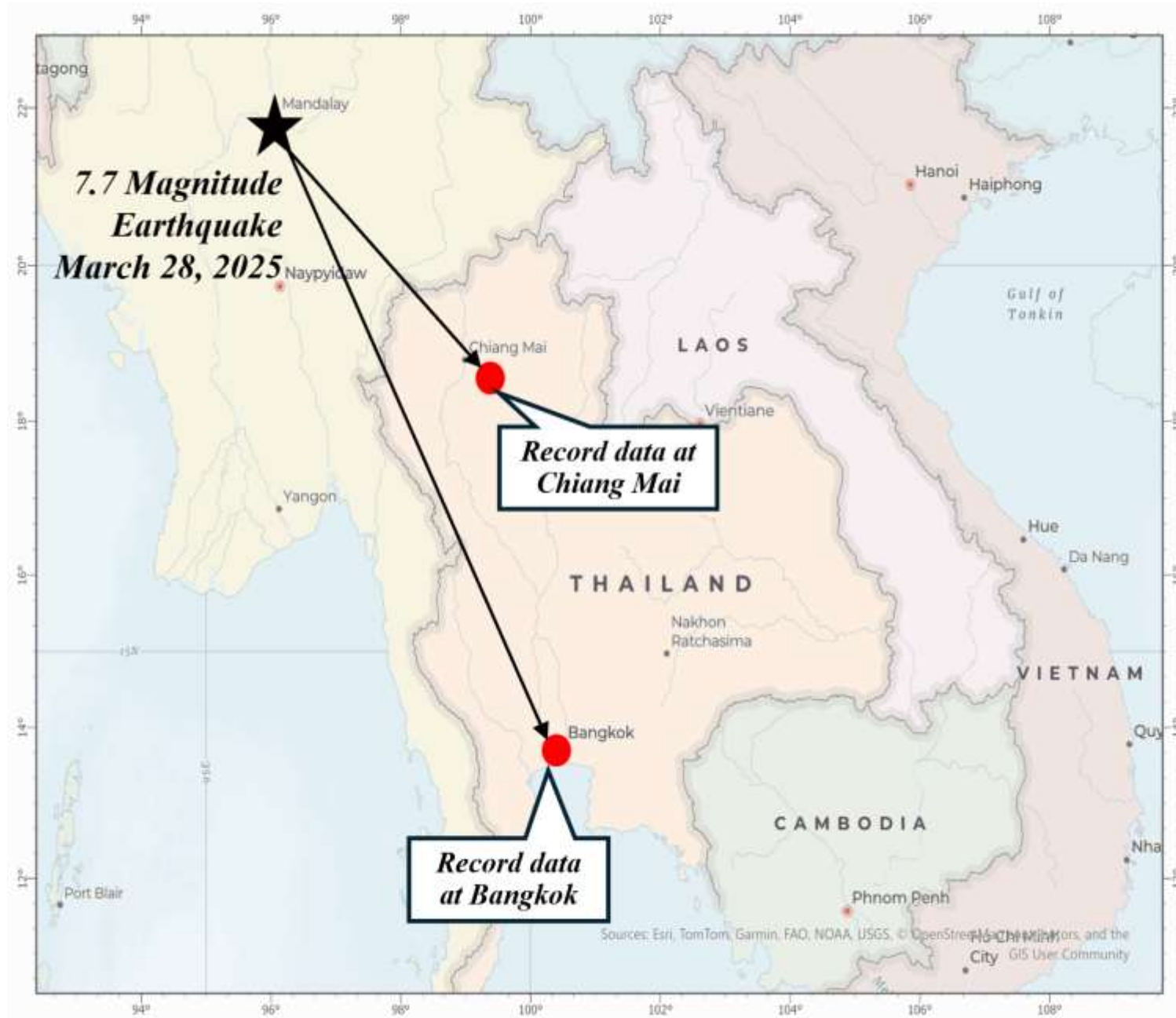


STRONG GROUND MOTION NETWORK





STRONG GROUND MOTION NETWORK





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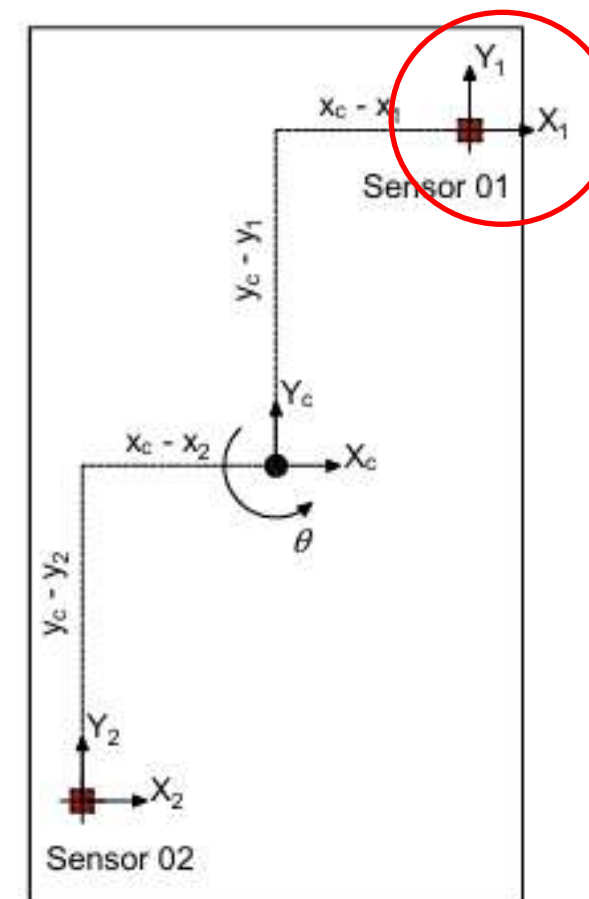
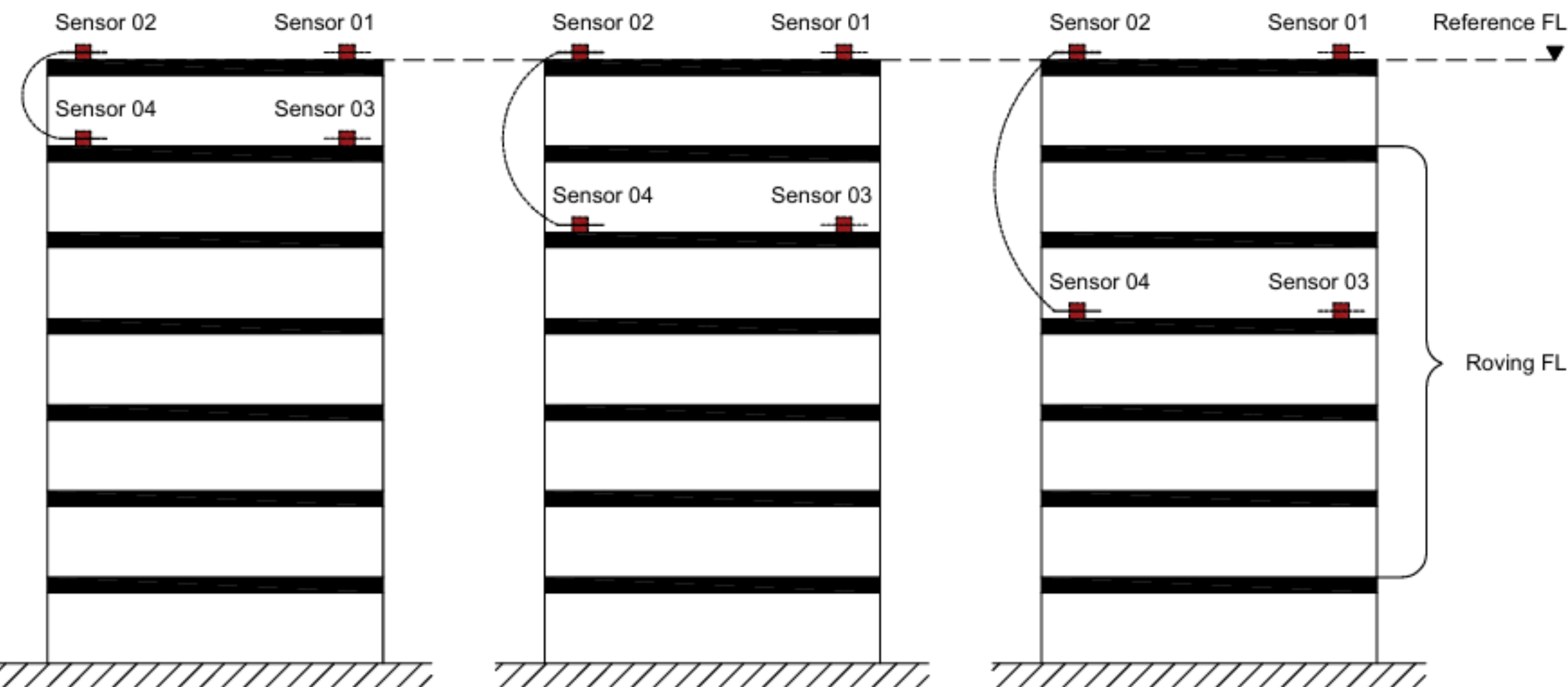
Cost-Effective Smart Sensing : Application (3)

Identification of Dynamic Properties of Buildings

Start



Identification of dynamic properties



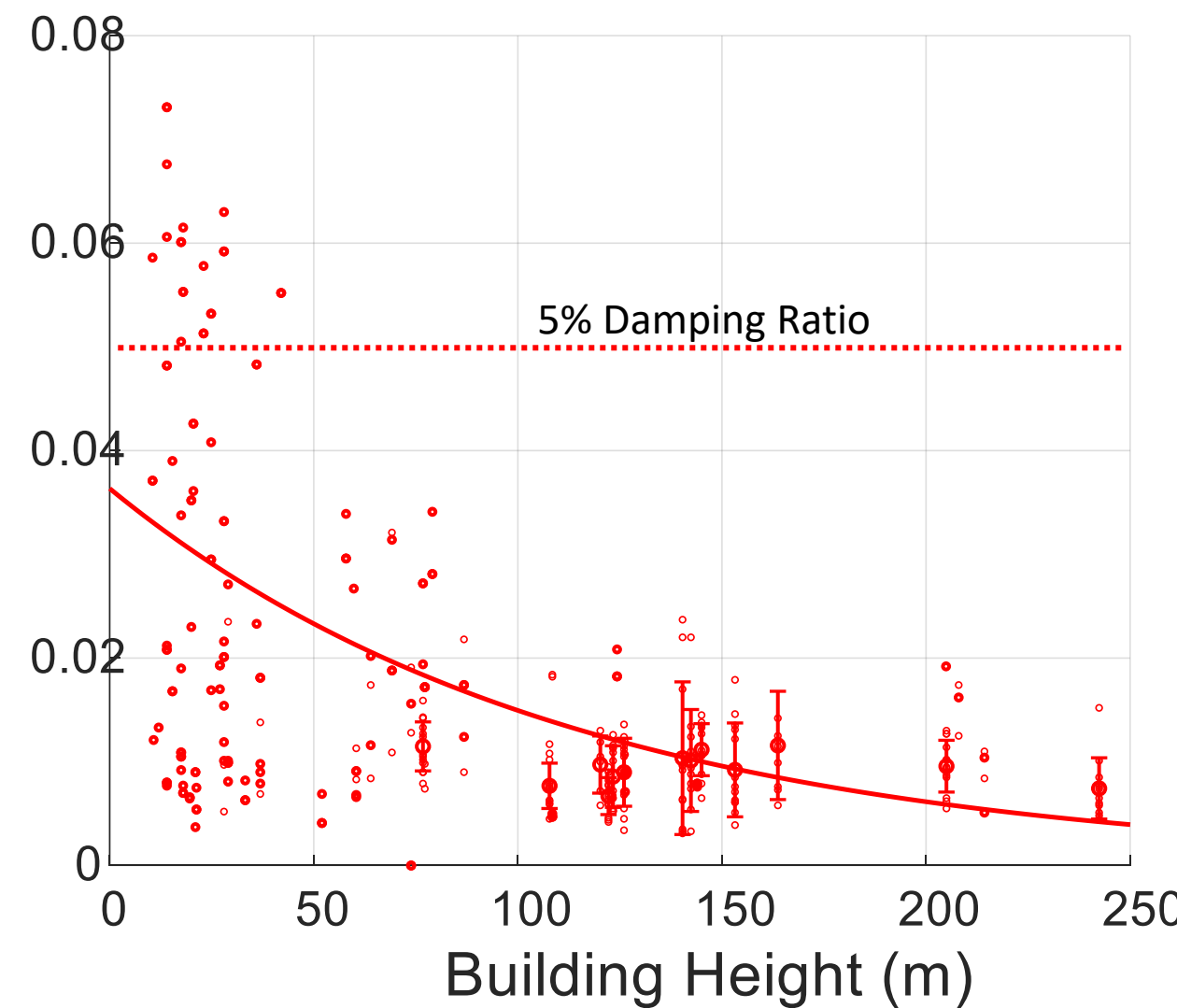
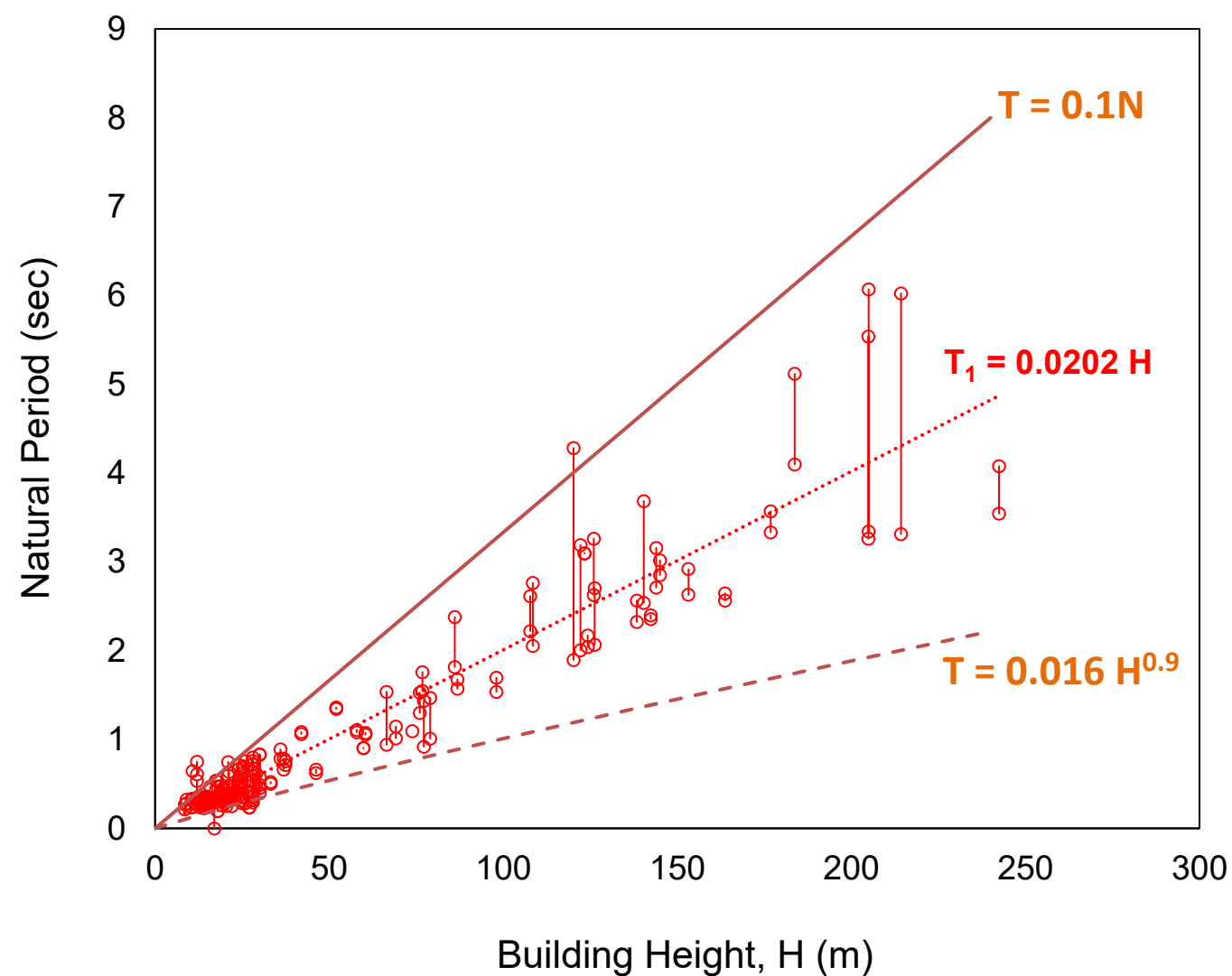
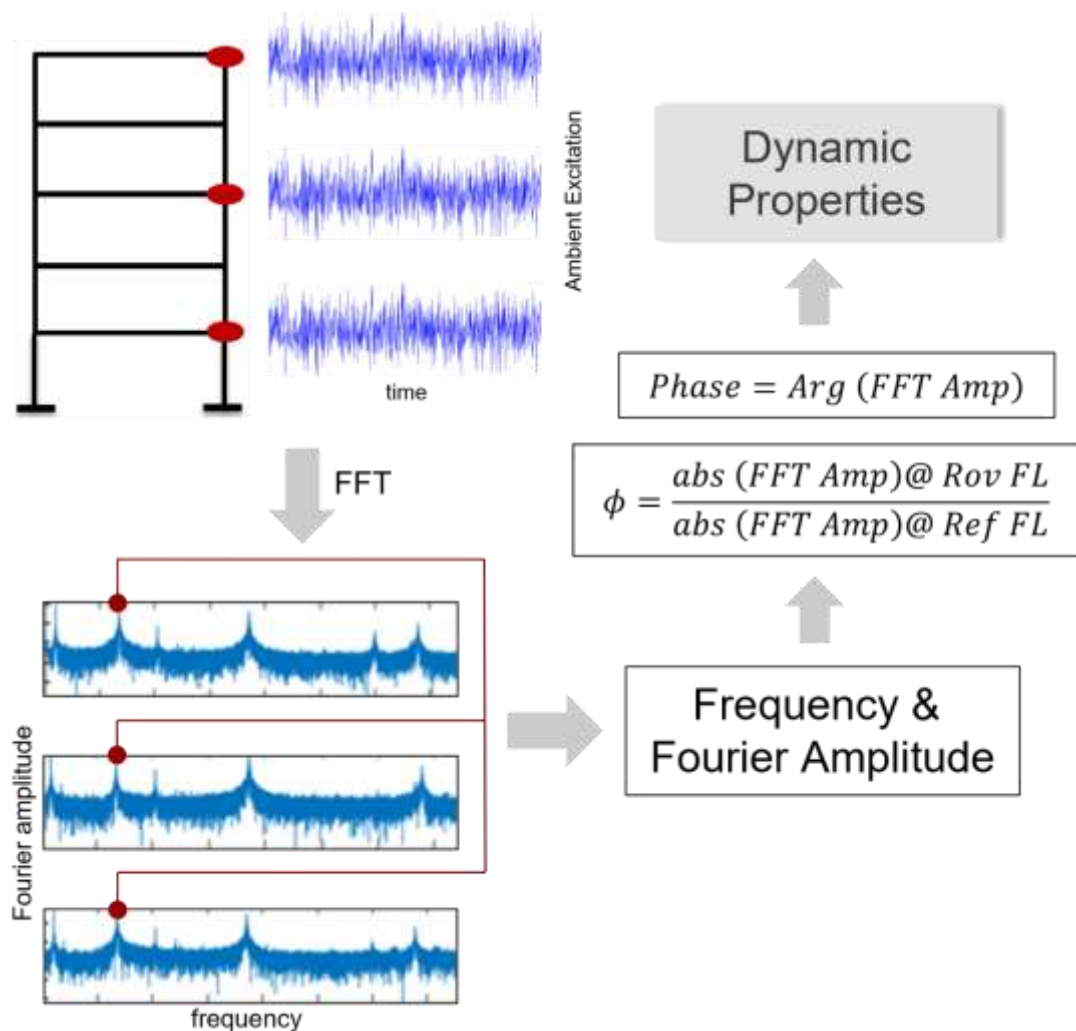
RS3D

Reference-Roving Sensor Set-up in Elevation and Plan





Identification of dynamic properties





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THANK YOU!

Let's collaborate to build a safer, smarter future together

