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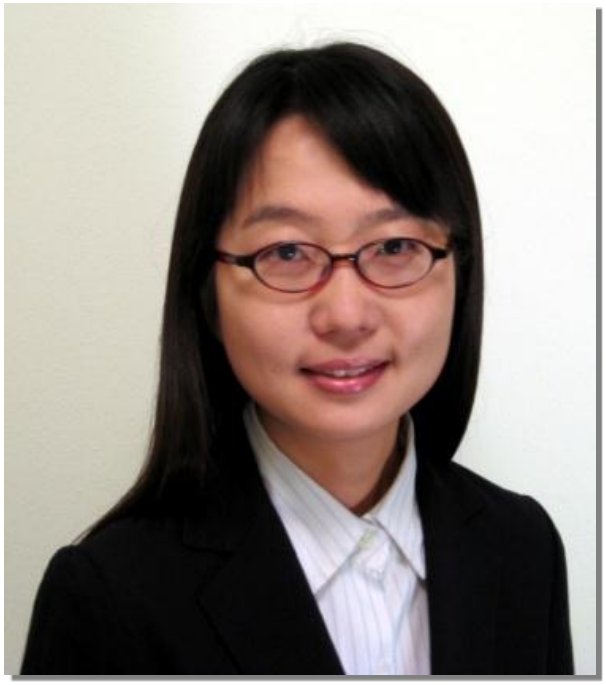
Shinae Jang



Assistant Professor
Civil and Environmental Engineering
University of Connecticut

- Education
  - B.S. CEE, KAIST
  - M.S. CEE, KAIST
  - Ph.D. CEE, UIUC
- Research Interests
  - Smart Structures
  - Bridge health monitoring
  - Wireless smart sensor network (WSSN)
  - Damage detection algorithm
  - Random vibration

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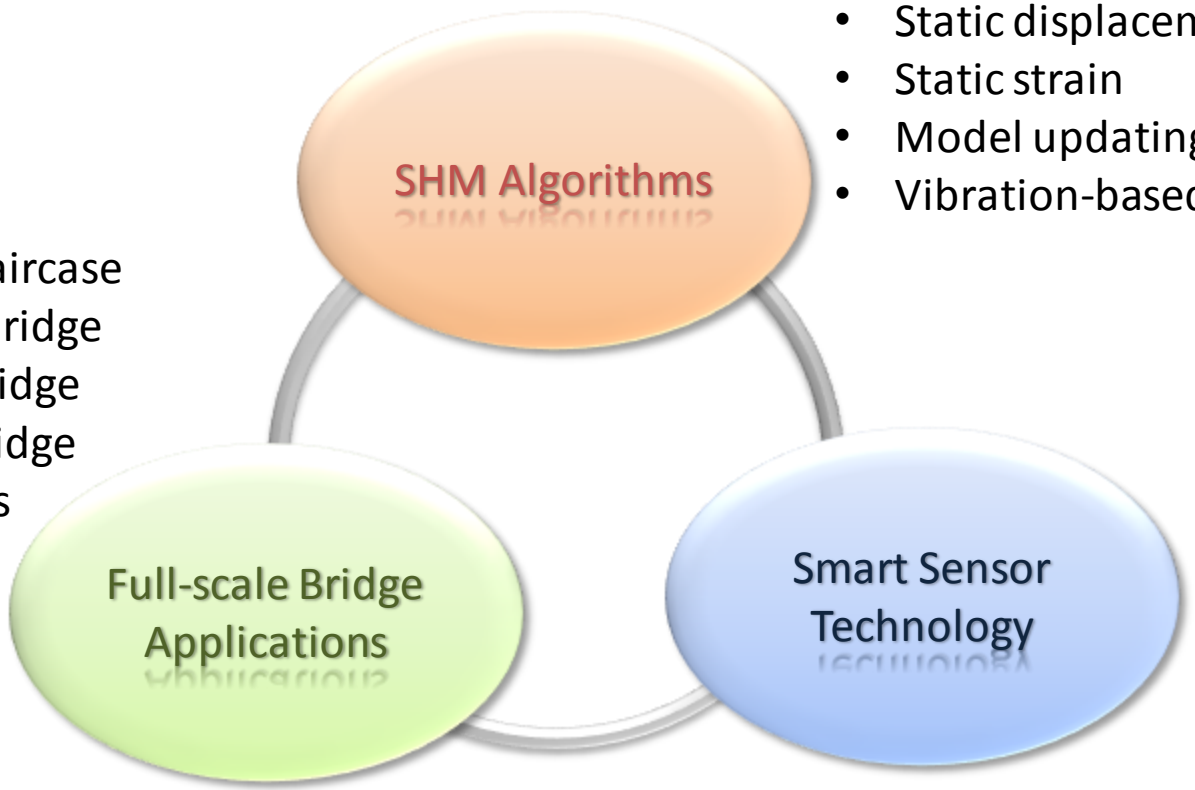
Research Interests

- Static displacement
- Static strain
- Model updating
- Vibration-based



- Architectural staircase
- Movable truss bridge
- Historic truss bridge
- Cable-stayed bridge
- Highway bridges

- Sensor deployment
- Environmental hardening
- Parameter optimization
- Software development

US-Korea-Japan Test Bed on Smart Wireless Monitoring of the Second Jindo Bridge

(September 2008 – present)

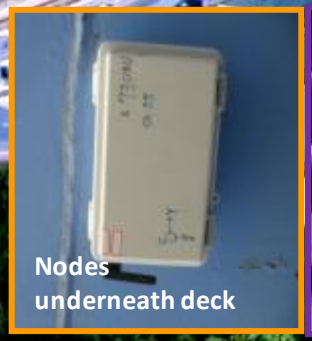
2nd Jindo Bridge

Haenam (Inland)

Jindo Island

423 sensor channels
World's largest deployment

2nd Jindo Bridge	
Type	Cable-stayed bridge
Spans	70+344+70 = 484m
Girder	Steel box (12.55m width)
Design velocity	70 km/hr
Designed by	Yooshin cooperation (2000, Korea)
Constructed by	Hyundai construction (2006, Korea)
Owner	Iksan Regional Construction and Management Administration
Special feature	Twin bridge


Nodes underneath deck

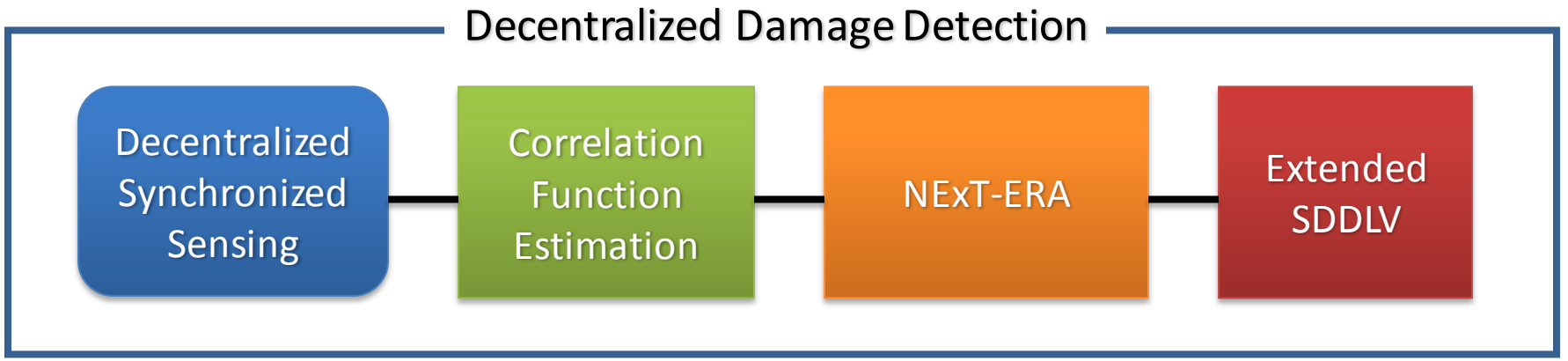

Nodes on cables (powered by solar cell)


Anemometer

Algorithm/Software Development for WSSN

- **Decentralized Damage Detection**

- On-board all-in-one application from measurement to damage detection
- DecentralizedDataAggregation (Sim, 2009), NExT-ERA, and extended SDDLV
- On-demand SHM application written in NesC/C
- Embedded in energy efficient AutoMonitor application (Rice, 2009)



Future Direction

• *Hardware*

- Energy harvesting sources
- Corrosion monitoring devices
- Practical bridge monitoring (scour, expansion joints)
- Environmental monitoring devices

• *Software*

- Environment monitoring software
- Graphical user interface
- High consequence/rare event monitoring
- Multi-hop communication






• *Analysis & Monitoring*

- Application on various infrastructure
- Life cycle analysis
- Decision making tools with SHM results
- Wireless communication study

• *Collaboration*

- Department-level collaboration
- Adaptation of state-of-the-art technology
- International collaboration for test-bed
- Web-based data repository