HSAEP: a new platform to evaluate hybrid simulation algorithms

Wei GUO, Xiaoxu DUAN, Chen ZENG, Ping SHAO

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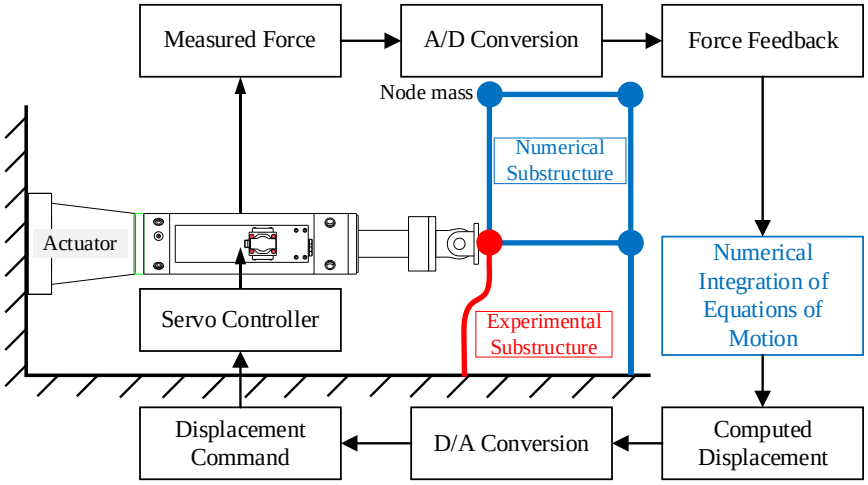
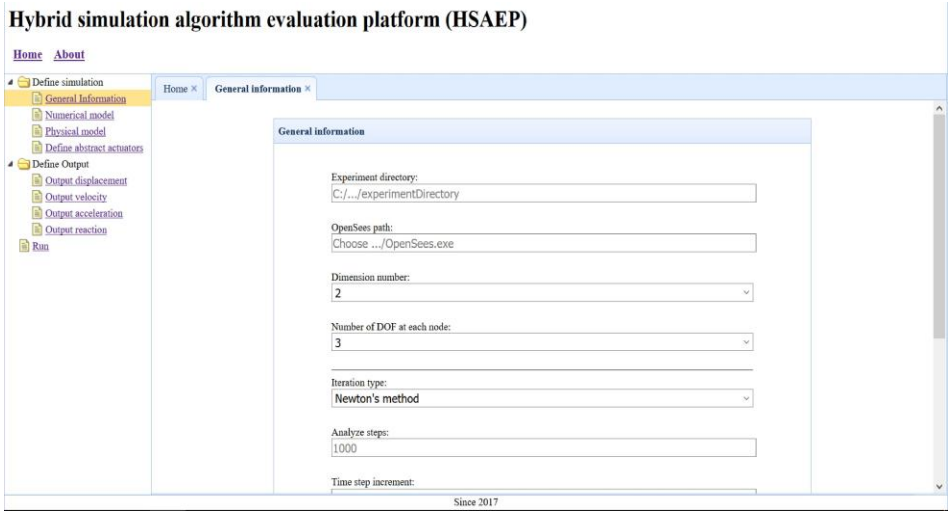
Problems & Ideas

- Problems of hybrid simulation algorithm evaluation
  - — The performance of the hybrid simulation algorithm has a great influence on the test results.
  - — There is no standard test platform for testing the performance of the algorithm.
  - — There is no standard test model to evaluate the pros and cons of the algorithm.
- Ideas: develop a hybrid simulation algorithm evaluation platform
  - — Provide tools and references for algorithm evaluation
  - — New elements and algorithms can be easily added in the model



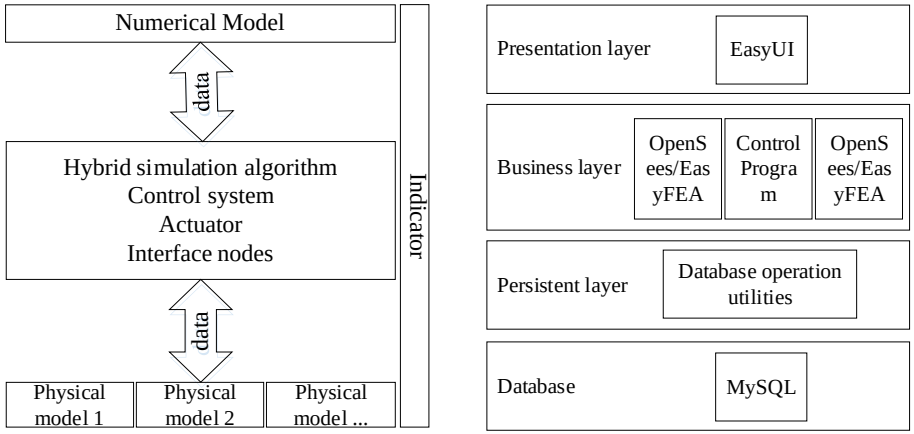
- **Schematic of hybrid simulation**



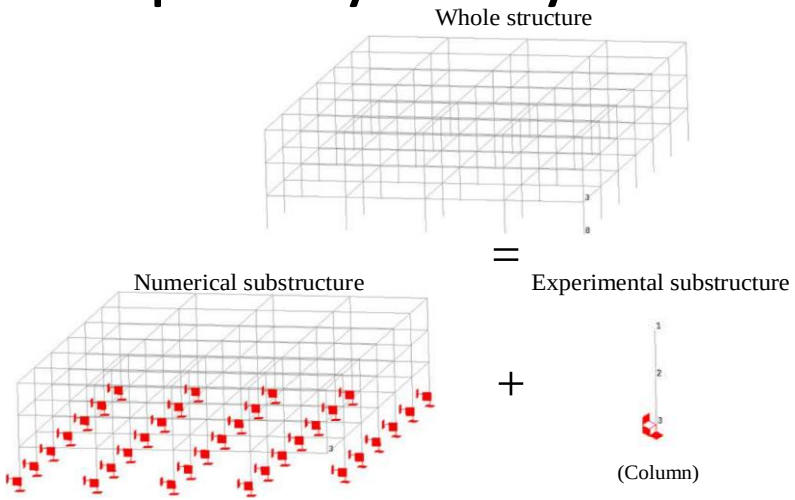
- **GUI of the platform**

Main Contributions

- **Framework and Architecture of HSAEP**

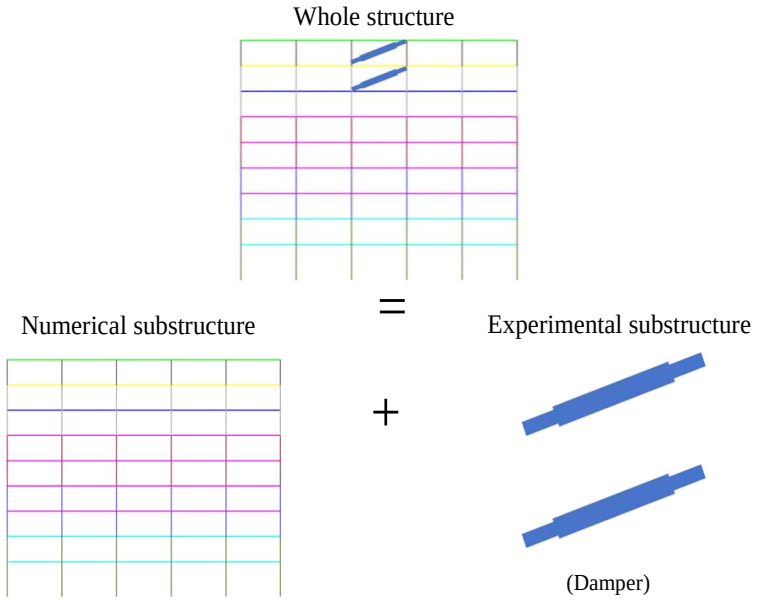


- **Case 1: pseudodynamic hybrid simulation**



Seismicwave	Method	J_1	J_2(m/s^2)	J_3(kN)
El Centro	integration	0.0075	15.4679	29177.3
	BFGS	0.0070	14.1434	27035.8
Northridge	integration	0.0187	28.9948	78949.8
	BFGS	0.0166	40.4627	66481.1

- **Case 2: real-time hybrid simulation**



- **HSEM values of Case 2**