

Collaborative Cloud Computing for Structural Health Monitoring using Jupyter Lab

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ABSTRACT

This study demonstrates advantages of Jupyter Lab as a highly efficient collaborative cloud platform for structural health monitoring applications. Structural Health Monitoring involves several steps: retrieving incoming data from sensors installed on structure, managing, and processing a large dataset (often Terra-bytes). In terms of retrieval of incoming data, it is not straightforward to place such a server in a campus or company network due to network security risk of the entire domain, but a cloud computer is a good alternative. In terms of signal processing on a large dataset, it is not straightforward to share the entire dataset as each researcher has to download the entire dataset to a local computer. However, Jupyter Lab in a cloud computer can be a promising alternative as Jupyter Lab allows the researcher to write their own signal processing code in Python in the cloud, to get it executed and the results visualised all on the cloud without downloading any data file. This study presents two examples of Jupyter Lab based structural health monitoring applications for a 319m transmission tower and an industrial chimney.

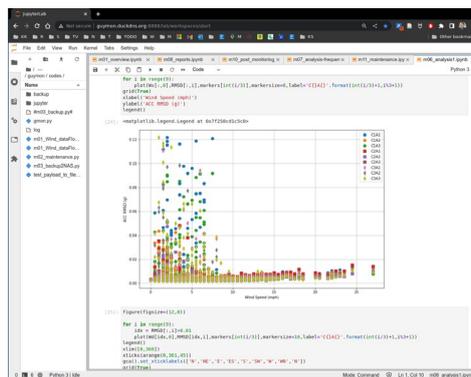


Fig. 1 Jupyter Lab web interface for writing, and executing a signal processing code together with visualization, all on a cloud computer

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