BUILDING STRUCTURAL AND HEALTH MONITORING SYSTEM USING IOT

A PROJECT REPORT

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BONAFIDE CERTIFICATE

Certified that this project report **"BUILDING STRUCTURAL AND HEALTH MONITORING SYSTEM USING IOT"** is the bonafide work of **"HARIHARAN C, KAILESHWARAN S, PAULMOHAN M"**, carried out the project work under my supervision.

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INTERNAL EXAMINER

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ABSTRACT

Wireless sensor networks (WSNs) are being suggested at an increasing rate for structural health monitoring (SHM). The objective is to monitor complex events (e.g., damage) in structures (e.g., an BRIDGES, a high-rise building) that is usually carried out with wired-based SHM systems. However, monitoring events with a WSN deployed over large structures is challenging due to WSN constraints (high-resolution data transmission, energy) and the quality of monitoring. In this project, we attempt to design a cyber-physical system (CPS) of structural event monitoring with WSNs, and propose a model in-network decision making in the CPS, named MODEM. The formation of engineering structures, and find that a large physical structure consists of a number of substructures. We enable deployed sensors to be organized into groups in such a way that a group-wise final decision can be provided for each substructure independently so that the existence of an event (if there is any) in a specific substructure can be identified by WSNs. MODEM is fully distributed in nature, and promises to have the monitoring quality be similar to the original wired based schemes, and consumes much less energy for transmissions and computations than existing schemes do. The effectiveness of MODEM is shown via both simulations and real experiments.

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CHAPTER 7

CONCLUSION

7.1 CONCLUSION

Structural health assessment was conducive to guide the maintenance of buildings, and SHM was widely used to handle this problem. Multiple Civil factors with different data structures cooperated with each other in SHM. We proposed the end-to-end framework to learn effective representations of these factors, instead of evaluating Building health with only single bridge factor in traditional techniques. Experimental results illustrated that the proposed architecture efficiently outperformed other compared techniques on Building health assessment. Significant tests verified the significant effectiveness of the proposed model using two different test methods. It was observed that the CNN-based models in our architecture had better performance with more pairs of convolution and pooling layers. Furthermore, we also discussed the feasibility of SVM in the classification step and obtained better enforcement than other classifiers. Ultimately, we analyzed the kernel effect in SVM and found out that linear kernel function was appropriate to building monitoring data. Since our architecture provided a comprehensive solution for civil health assessment, it can be implemented in real-world cases.

7.2 FUTURE SCOPE

Acoustic emission (AE) technology is a powerful tool for researching the intrinsic essence of materials and an effective method for Non Destructive Testing and Health Monitoring. Until this time, AE technique has been applying in many fields, e.g., aircraft structure, offshore platform, pressure equipment, rock, dam, concrete, steel, etc.AE technique was applied into civil engineering later compared with other fields, but