Development, Education, and Implementation of a Low-Cost Audio Sensor-based Autonomous Surveillance System for Smart and Connected Transportation Infrastructure Construction and Maintenance Dataset

Dataset available at: https://digitalcommons.lsu.edu/transet_data/73/

(This dataset supports report **Development, Education, and Implementation of a Low-Cost Audio Sensor-based Autonomous Surveillance System for Smart and Connected Transportation Infrastructure Construction and Maintenance**)

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The related final report **Development, Education, and Implementation of a Low-Cost Audio Sensor-based Autonomous Surveillance System for Smart and Connected Transportation Infrastructure Construction and Maintenance**, is available from the National Transportation Library's Digital Repository at https://rosap.ntl.bts.gov/view/dot/58712

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Abstract: Each DOT has to govern and oversee an enormous number of transportation construction and maintenance projects. However, since a transportation construction project entails several miles of a job site including numerous work tasks and equipment operations, it has been increasingly challenging for each DOT to consistently monitor progress of all projects in each State as well as efficiently evaluate work performance. In particular, with limited human resources and time, DOTs in Region 6 States have managed large-scale transportation construction and maintenance projects by a human inspection and recovered direct and indirect damages of transportation infrastructure systems caused from the recent natural disasters. In this demanding situation, DOT practitioners and project managers have long recognized the importance of automated monitoring and surveillance of transportation construction and maintenance processes that helps consistently track work progress and take immediate remedial action. As one promising supplement for site monitoring and human inspection, this project proposes a new approach for low-cost audio sensor-based autonomous site and safety surveillance of transportation construction and maintenance, which allows for faster, more convenient, and more accurate work zone monitoring. The proposed innovation using the sound-based site and safety monitoring framework possesses several competitive advantages over traditional site management and existing vision-based work monitoring methods, which not only sounds can be easily recognized and instantly analyzed by diverse sound sensors. In addition, this sound-based monitoring approach supports an unlimited range of monitoring angles and illumination levels with lightweight data processing and comparatively quick analytics. To achieve these goals, this study developed a low-cost wearable audio-sensor for automated work zone monitoring and real-time activity log generation. This new intelligent site and safety surveillance system is expected to support real-time monitoring of construction progress,

evaluation of task performance, and rapid identification of safety issues in transportation construction and maintenance projects.
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Dataset description:
This dataset contains 1 file described below.

19PPLSU12_DATA.xlsx:
The .xlsx and .xls file types are Microsoft Excel files, which can be opened with Excel, and other free available software, such as OpenRefine.

National Transportation Library (NTL) Curation Note:
As this dataset is preserved in a repository outside U.S. DOT control, as allowed by the U.S. DOT's Public Access Plan (https://ntl.bts.gov/public-access) Section 7.4.2 Data, the NTL staff has performed *NO* additional curation actions on this dataset. NTL staff last accessed this dataset at https://digitalcommons.lsu.edu/transet_data/73/ on 2022-01-10. If, in the future, you have trouble accessing this dataset at the host repository, please email NTLDataCurator@dot.gov describing your problem. NTL staff will do its best to assist you at that time.