

Bridge Construction Monitoring using LIDAR for Quantified, Objective Quality-Control Quality-Assurance (QOQCQA) Dataset

Dataset available at: <https://doi.org/10.5281/zenodo.4273237>

(This dataset supports report **Bridge Construction Monitoring using LIDAR for Quantified, Objective Quality-Control Quality-Assurance (QOQCQA)**)

This U.S. Department of Transportation-funded dataset is preserved in the Zenodo Repository (<https://zenodo.org/>), and is available at <https://doi.org/10.5281/zenodo.4273237>

The related final report **Bridge Construction Monitoring using LIDAR for Quantified, Objective Quality-Control Quality-Assurance (QOQCQA)**, is available from the National Transportation Library's Digital Repository at <https://rosap.ntl.bts.gov/view/dot/58940>.

Metadata from the Zenodo Repository record:

Title: Bridge Construction Monitoring using LIDAR for Quantified, Objective Quality-Control Quality-Assurance (QOQCQA)

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Description: Transportation infrastructure construction quality control and quality assurance demands construction monitoring by field inspectors. Currently, these inspectors monitor infrastructure by measuring and photographing structures. These tasks allow them to assess any correction decision during construction or to inform about the quality of the construction process for the future. In order to promote and objective decisions obtained during infrastructure construction, the proposed research project developed and implemented a methodology to measure construction progress and compared it with the designed 3D shape, quantifying the difference. This proposed project includes implementation for the development of DOT standards that could be added in near future bridge construction documents. The New Mexico Department of Transportation (NMDOT) showed a strong interest in this topic. The experience of the PIs on bridge design and construction, field inspection, and LIDAR technology was integrated in order to evaluate the results with impact both in research and in industry. Specifically, the research results outline recommendations about standards for implementation of technology in specifications for NMDOT or other DOTs.

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Keywords: LIDAR, reinforced concrete, construction inspection, specifications, data acquisition

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Dataset description:

This dataset contains 1 file collection described below.

Data-20201114T023951Z-001.zip:

- Data Folder
 - 11 LIDAR scanning wingwall data collection Folder
 - 0312 Scan data Folder
 - 2020-03-12_08-17-01_100pct_0mm_time_smoothing_Rebar (1).zip
 - Adobe-Acrobat-DC-Serialization-Files.zip
 - Rebar_Segmented_100pct_0mm_time_smoothing_scan - Cloud.e
 - Rebar_largeArea_Segmented.zip
 - HORIZON-Product-Card.pdf
 - LIDAR DATA.xlsx
 - Rebar_41sec_100pct_time_smoothing_scan.e
 - Tape measurement for wingwall rebar Folder
 - 1-5.png
 - 4-7.png
 - 6-10.png
 - 8-12.png
 - 9-12.png
 - A-C.png
 - B-E.png
 - D-G.png
 - F-WALL.png
 - drawing.PNG
 - VT_Alان Folder
 - IntPoly_cs.m
 - UNM_rebar_present[85299].pptx
 - densityByLayer_example.m
 - rebar_spacing_results_alan[93597].png
 - rebar_spacing_results_alan[93600].png
 - small_rebar_4M.mat
 - WALL-3.png
 - dataprocessing.rar
 - larger site 2.jpg
 - larger site.jpg
 - thumbnail_IMG_0745.jpg
 - 18 Wing wall data processing results Folder
 - Advanced Slice_method.rar
 - projection algorithm.rar

File Type Descriptions:

- The .e file type is associated with the EiffelStudio, an integrated development environment for Microsoft Windows, Apple Mac, Linux and other platforms. The e file

stores source data for EiffelStudio, (for more information on .e files and software, please visit <https://www.file-extensions.org/e-file-extension-eiffelstudio-source-data>).

- The .pdf file format is an Adobe Acrobat Portable Document Format (PDF) file and can be opened with the Adobe Acrobat software.
- The .xlsx and .xls file types are Microsoft Excel files, which can be opened with Excel, and other free available software, such as OpenRefine.
- The file extension .png is commonly used for images in Portable Network Graphics file format. PNG is a bitmap graphics format similar to GIF, that uses image compression mainly for web purposes (for more information on .png files and software, please visit <https://www.file-extensions.org/png-file-extension>).
- The .pptx file extension is related to Microsoft PowerPoint. PowerPoint is worldwide most popular powerful tool you can use to create and edit dynamic and great-looking presentations. The pptx files are used for editable slide shows, which are very often used for presentations (for more information on .pptx files and software, please visit <https://www.file-extensions.org/pptx-file-extension>).
- File extension .m is associated with the Objective-C, a general-purpose, object-oriented programming language based on Smalltalk language developed by Apple, Inc (for more information on the .m file type and associated software, please visit <https://www.file-extensions.org/m-file-extension>).
- The .mat file extension is associated with Ox. Ox is an object-oriented statistical system. At its core is a powerful matrix language, which is complemented by a comprehensive statistical library (for more information on the .mat file type and associated software, please visit <https://www.file-extensions.org/mat-file-extension-ox-object-oriented-matrix-programming-language-matrix>).
- The .jpg file extension is associated with JPEG (Joint Photographic Experts Group) file format. JPEG is a lossy image compression algorithm that significantly reduces the file size of the original image at the cost of quality. The higher the compression ratio the lower the quality of the .jpg file (for more information on .jpg files and software, please visit <https://www.file-extensions.org/jpg-file-extension>).
- The .rar file type is best known for its use as a compressed archive format, similar to other compressed file archive formats, .rar files are data containers, that store one or several files and folders in compressed form. Compressed data can be in one single file or multiple splitted files, (for more information on .rar files and software, please visit <https://www.file-extensions.org/rar-file-extension>).

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://doi.org/10.5281/zenodo.4273237> on 2022-05-09. 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.