

# Guideline for planning, performing, documenting and archiving a measurement project in structural engineering research

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## Abstract

This document gives a brief guideline on how to properly plan, perform, document and archive measurements such that the data acquired in the project can be used by yourself and others in the future.

## 1 Introduction

Master students, PhD candidates and other researchers will most likely have to conduct a measurement project at some point in their career. The objective of a measurement project is to obtain data that supports a hypothesis. There are two essential components to *the data* obtained in such a measurement project: *data points* and *metadata*.

**Data points** is the actual reading from a sensor, e.g. the acceleration from an accelerometer, the strain from a strain gage or the temperature from a thermometer. This is the first (and only?) component of data that most people think of when they hear *data*.

**Metadata** is data about data points. Type, sensitivity, position and orientation of an accelerometer that is used to obtain accelerations are all examples of metadata. This is the component of data that is most often missing when you retrieve data from a fellow researcher or from a previous measurement project stashed on an old harddrive.

In order to analyse and make sense of *the data* it is essential that both components Without

The data produced in these measurement projects are typically acquired, analyzed and reported within a relatively short timeframe in which the researcher has control (fresh memory) of the measurement set up and environment that the project was performed in, perhaps distributed on hand written notes and short files on the current working directory. The researcher then continues on to the next project while the data and metadata obtained in the previous project is left on some directory on some hard drive.

These measurement projects produce data which is invaluable to the education of structural engineers and advancement of the current state of the art. Ideally, data Typically, measurement projects performed by one researcher will produce data which the researcher subsequently analyzes and “archives”.

Experience has shown that the researcher is generally able to obtain the data points from the structure and is able to perform a preliminary analysis of the The following task must be performed in order to obtain *usable* data:

- Planning
- Equipment installation
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This may sound simple enough, and it may be simple, but experience shows that researchers at all levels fail to properly