

Using iSeismograph and the NEEScentral Data Repository for Earthquake Engineering Experiments

Case Study: Cantilever Beam Experiment to Investigate Free Vibration for the SE 180 Earthquake Engineering Course at UCSD

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I Introduction

In this experiment, a MacBook laptop with a built-in accelerometer and video camera is used to record synchronized data and video during an experiment measuring the free vibration of a cantilever beam. The MacBook laptop will also be used to upload the experimental data to the earthquake engineering research data sharing archive, NEEScentral (<https://central.nees.org>).

To maximize participation, it is recommended that the class be divided into smaller project teams. Each team may conduct 1-2 experiments in the laboratory using the MacBook laptop. The data obtained during each team's experiments should be uploaded into different sections within NEEScentral. After the experiments are completed, the data can be downloaded and used by students to investigate basic dynamic properties of the cantilever beam.

2 Creating a NEEScentral Project

To enable the students to effectively utilize NEEScentral, instructors must complete the following steps prior to conducting the experiments.

1. Register for a NEEScentral account (<https://central.nees.org/acct/>)
2. Once your account request is approved, create a new project in NEEScentral.
 - a. Log in to NEEScentral.
 - b. Click on the "My Projects" tab
 - c. Click on the "Create New Project" button (Figure 1)

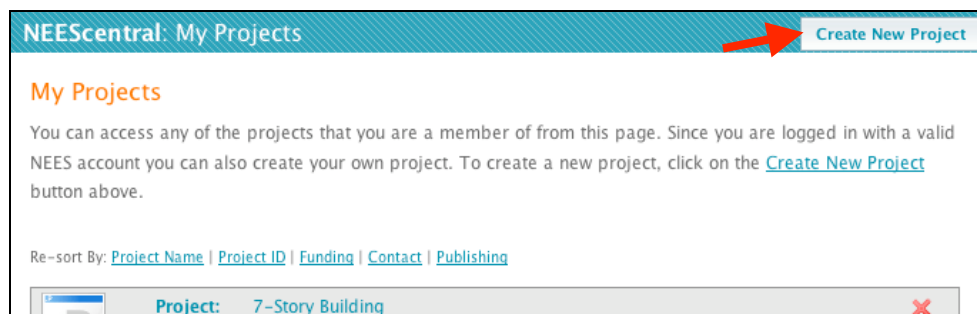


Figure 1

3. E-mail NEESit (it-support@nees.org) and provide them with the following information:
 - a. University
 - b. Class name (class number)
 - c. Instructor Name
 - d. Brief description of the class
 - e. Brief description of the experiment and data to be uploaded to NEEScentral

4. Advise students to register for individual NEEScentral accounts.
 - a. To expedite the approval of their accounts, students should include the class name or class number in the "Comments" field of the "Account Request Form".
5. Once students have received a NEEScentral accounts, add each student as a member of the class project on NEEScentral.
 - a. Select the class project from the list of projects under "My Projects"
 - b. Click on the "Members" button. A list of existing members of this project will appear (Figure 2).

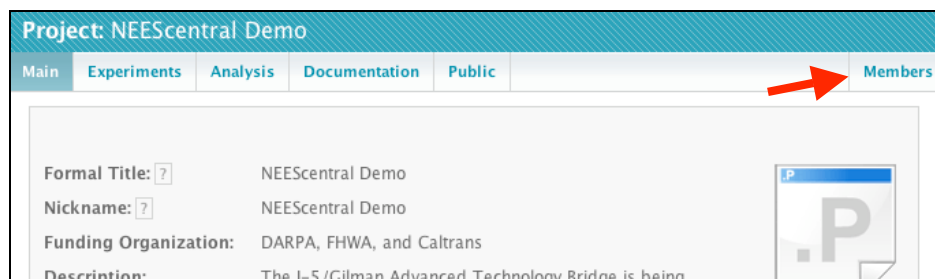


Figure 2

- c. At the bottom of the members list, choose a student's name from the drop-down menu, and click "Grant Membership"
- d. Grant "View", "Create" and "Edit" permissions to each student, so that they will be able to upload data into this project with their own account
- e. Check the box, "Check this box to grant this member the same roles and permissions on all experiments in this project" before granting membership (Figure 3).

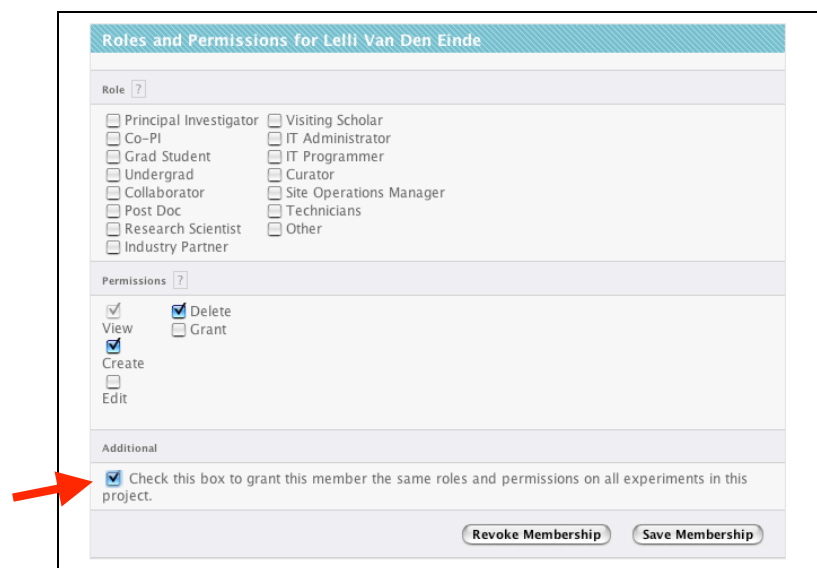


Figure 3

6. Create a new experiment in your project.
 - a. Select your project under the “My Projects” list
 - b. Click on the "Experiments" tab
 - c. Click the "Create New Experiment" button.

7. Decide how you will divide the students into teams. For each team, create a new trial under your newly created experiment.
 - a. Select appropriate experiment
 - b. Clicking on "Trials" tab
 - c. Click on the "Create New Trial" button

8. From the “Trials” page, take note of the experiment number as well as the trial number assigned to each team. Inform each student team of the experiment number and their assigned trial number. Each team will use this information later when running the experiment and uploading the data into NEEScentral.

9. As the experiment is conducted, all of the data is automatically uploaded and placed in a data folder for their specific trial. Advise each student group to look for their data in the “Unprocessed_Data” folder for “Repetition 1”.