**Progress Report Week 1**

**Group Name: X**

**Part I: Ice core analysis:**

Exploring the data: The data was stored in NIfTI (.nii) format. The volume has the dimensions of xxx, a voxel size of xxx, and the intensities stored in a xxx bit-representation in the range from xx to xx. An example slice and histogram of the intensities are shown in Figure 1.

**Figure 1:** Provide an appropriate figure caption.

Identifying bubbles of 18O: The colormap and contrast range was adjusted to easily distinguish the various air bubble types from one another (see Figure 2).

**Figure 2:** Provide an appropriate figure caption.

Counting and measuring bubbles of 18O: Using the ruler tool of ITK-SNAP (see Figure 3) we detect the following:

* Number of 18O bubbles: X
* Approximately having the following diameters: [X , X , … ] mm.

**Figure 3:** Provide an appropriate figure caption.

Analysis: We then calculate the proportion of 18O bubbles in the ice core

The volume of core cylinder: Add description

The total volume of 18O bubbles: Add description

The density: Add the number

**Part II: MNIST Classification:**

Exploring the data:

The MNIST dataset consist of X training and X testing images of handwritten digits, each of size 28 x 28. Examples from each of the 10 classes are shown in Figure 4.

**Figure 4:** Provide an appropriate figure caption.

Testing a small MLP model for classification: First we test a relatively small fully connected MLP, consisting of X hidden layers of size X. This gives the model X trainable parameters. Describe other choices of the network (activation function, loss function, optimizer, training epochs / iterations). The training and test loss curves are shown in Figure 5. We see that describe the result (e.g. final accuracy).

**Figure 5:** Provide an appropriate figure caption.

Testing a large MLP model for classification: Train a model with approximately X trainable parameters.

The model consists of X hidden layers of size X, which gives the model X trainable parameters, but otherwise with the same settings as the small model. The training and test loss curves are shown in Figure 6. We see that describe the result (e.g. final accuracy).

**Figure 6:** Provide an appropriate figure caption.

Testing a “mid-sized” MLP model for classification: The model consists of X hidden layers of size X, which gives the model X trainable parameters, but otherwise with the same settings as the small model. The training and test loss curves are shown in Figure 7. We see that describe the result (e.g. final accuracy). Examples of misclassified test images are shown in Figure 8.

**Figure 7:** Provide an appropriate figure caption.

**Figure 8:** Provide an appropriate figure caption.