The 13th week updates

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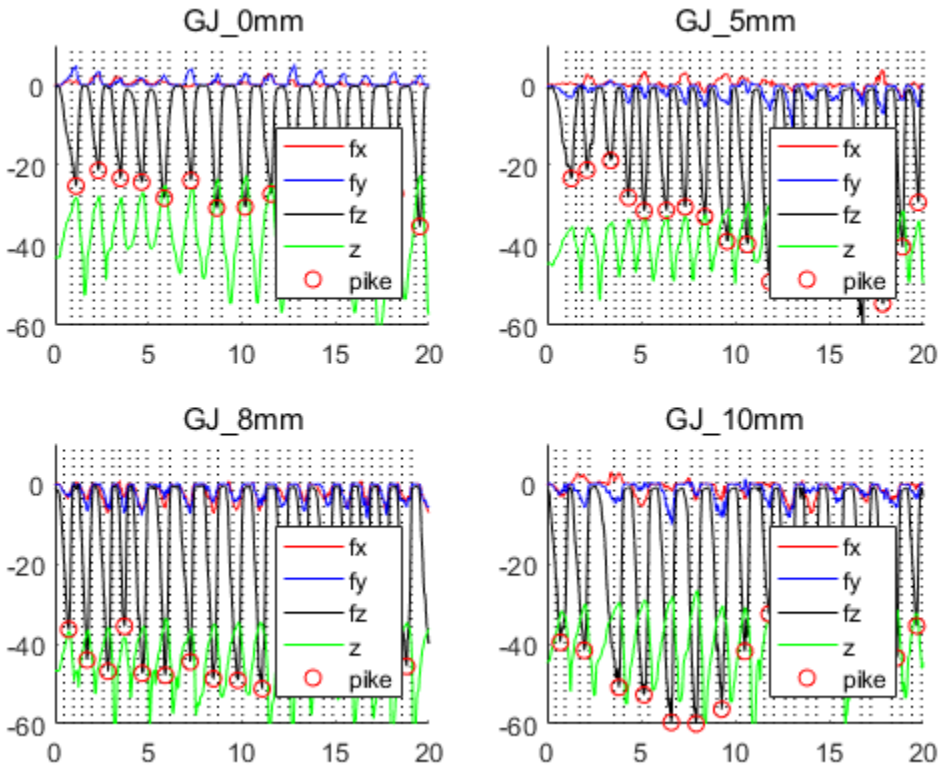
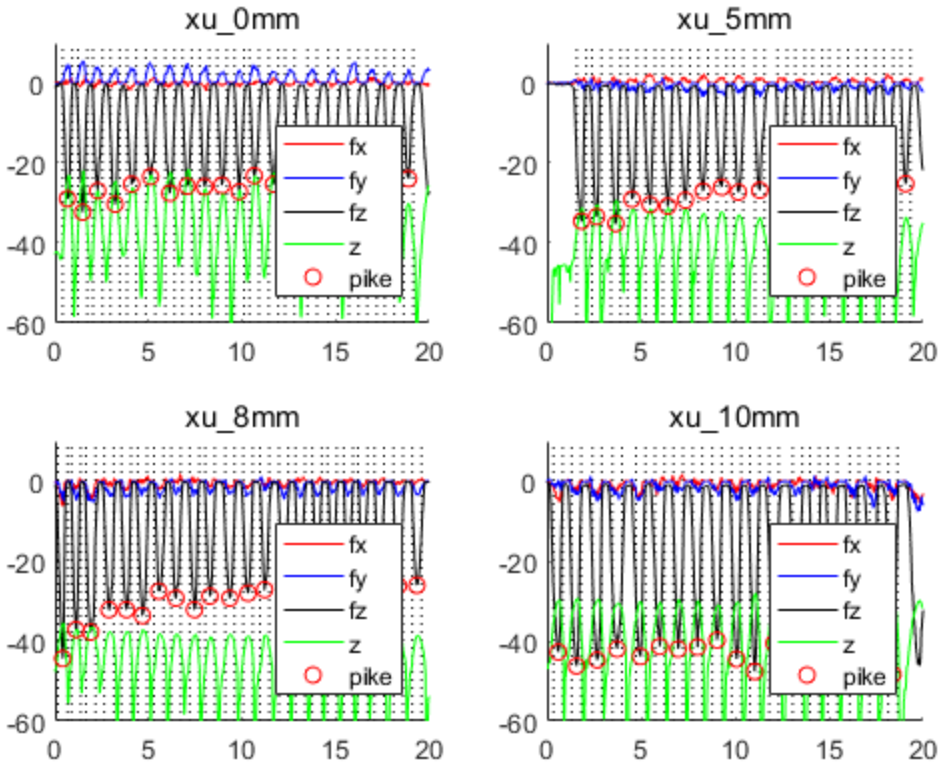
Works have been done this week:

1. It can be found that those touching process in the data, the 1st one and the last one **may not be a complete process**, so the 1st and the last one have been **removed** from dataset.





2. The **training** and **testing** data has been divided, **2/3** of the whole data are chosen as the training data (96 samples in total) and the rest **1/3** of the whole are chosen as the testing data (48 samples in total).

3. In the raw training data, the dimension is **1006** (the sampled points of fz and z in the experiment). Using the **deep learning based** feature extract method, the **stacked autoencoders** are adopted to conduct the **feature extraction**. In the stacked autoencoders, there are **two neural networks** are adopted, the first one is used to reduce the dimension from **1006 to 200**, and the second one is used to reduce the dimension from **200 to 50**, by **connecting** these 2 autoencoders, the dimension of the raw data can be reduced from **1006 to 50**, which is proper for the classification. The

structure of the stacked autoencoders can be viewed in the following figures:

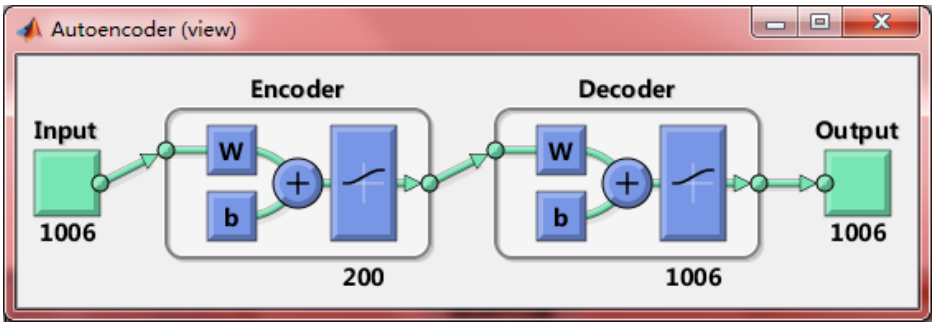


Fig. 3: Reduce the dimension of the raw data from 1006 to 200

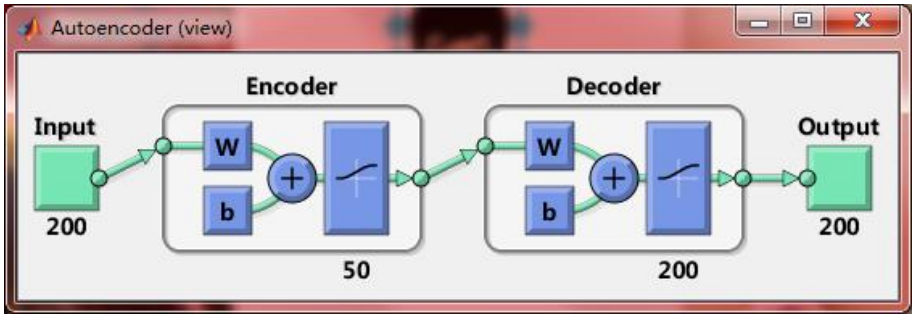


Fig. 4: Reduce the dimension of the data further from 200 to 50

4. Disused with Jing Guo on the project.
5. The paper has been gotten back from Dr. Lam, and hopefully will be ready to submit in the coming week.

Works in the coming week:

1. Based on the extracted feature of the palpation data, the classification algorithms based on neural network, support vector machine, etc. will be used to see if the classification results good enough.
2. Discuss with Wenjun Xu and Jing Guo on the results and approaches.
3. Revising the time-varying delay paper and proofread it.