**Week 5 Weekly Report**

**1. What you have done for the project during the week individually?**

In week 5, There are 5 related research paper were found. The approaches in those paper are:

1. Determine the project is a performance evaluation study of software vulnerability detection based on deep learning algorithms.
2. Automatically extract features from the source code using external tools.
3. Using programming methods to parse the features into deep learning vectors for further training.
4. Apply several (5-20) deep learning algorithm to train different models.
5. Define a performance metrics for indicating the performance of the models.
6. Using test dataset to verify the models
7. Repeat for 10 times to avoid potential faults.
8. Compare the final score and investigate which approach is the best.

As I have assigned the “How do you analysis the data?” part of the proposal, I have concluded that

First step we need data pre-processing where we use “CodeSensor 1 ” to extract ASTs from source code. Then we convert parsed ASTs to vectors while preserving the structural information. And the sequence of elements in a vector matters because they partially reflect the hierarchical position of the nodes in an AST.

Second step employ different deep learning algorithms for feature learning.

For evaluating the results, there are Positives (Vulnerable functions) and Negatives (Not vulnerable functions) results. We need to evaluate the outputs is to make use of TP (true positive), FP (false positive), TN (true negative), and FN (false negative).

**2. What you plan to do for the project next week individually**

As YongZheng emphasis in the Client Meeting, we are getting a large scope of the project. It is including too many big staffs which we cannot finish in a limited time frame.

I am going to narrow down the project scope. Instead of adding too many big requirements, I need to focus more on the core functions of our product. Investigate more detailed core functional requirements for the project.

Determine the restrictions and edges of the project and confirm with our client to narrow down the scopes of the project.