

## 1 Progress

- Foundations in Machine Learning (Clustering, Optimization Method, Neural Network) and relevant basic mathematical principles.

## 2 Research Direction Exploration

Regarding Medical Pattern Recognition

1. Optimization in Target-oriented Network Architecture (Hyperparameters)  
*e.g. Lung Pattern Classification for Interstitial Lung Diseases Using a Deep Convolutional Neural Network:*  
Shrink kernel size as texture size is relatively small, omit pooling layer to prevent information loss. Grow kernel number by receptive field size ( $k = L^2$ )
2. Disease Quantification and Differential Diagnosis of new Pathology

**Problem: Criterion for Direction Evaluation**