TECHNIQUE REPORT

**Approach to AI**

referringCNN



*The meaning of life is to give life a meaning …*

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# OVERVIEW

At the beginning procedure of a training process, we fix some of the filter weights of classical CNN with classical convolution kernels such as sobel, kirch etc. After serveral fixing training phases when the net got stable, some of these fixing weights could be released free of fixing so that the network arrived at a refinement status.

Short term targets:

* 实现参考学习的轻量级平台
* 支持脚本进行网络参数匹配
* 测试平台在mnist上的训练速度和分类性能

Long range targets:

* The definition of referring learning and referring CNN
* The relationship between referring learning and transfer learning
* How to evaluating the robustness, stabling and generalization ability of a referring block

Network that can distinguish difficulty levels, easy cases will be trained lightly while difficult cases will be thoutoughly exhausted trained in the network structure.

## Current Work

未来3个月目标：

运行实例，改善实例的load流程，优化实例的输出

level-training algorithm:

* in each level the training algorithm is at different stage with different strategy
* example: dark image vs bright image lead to different next processing stage

增加模板类 头文件：hybrid\_conv\_layer.h，实现：hybrid\_conv\_layer.hpp。

### Mission today

构造 tiny testcase 调试网络的构造流程

构建一个简单的深度网络进行测试

Tiny testcase - mnist

## How to Make AI Distinguish Difficulty Levels

# PRELIMINARIES

## Terminology

### What is a referring block?

# DATA

The classical flow of machine learning including the following steps:

1. Data source gathering
2. Row data processing
3. Feature fetching
4. Data classification
5. Model training
6. Model verification
7. Model testing
8. Prediction and classification

## The Process of Data Management

### The format of training data

### Data preparation tools

# CODES IMPLEMENTATION

## The Architecture of referringCNN

### Displaying the Debuging Information

### Some Macros

## Main Working Flow

## Reusable Classes

### CInit

# GUI

## Parameters

### net config

## ini

## Message Manager

### progress bar

## Working Thread

### Job

### Job parameters

## Debug

### 

# ARTIFICIAL NEURAL NETWORK

## Toeplitz Matrix

# EXPERIMENTS

## The Architecture of Testing Flow

## Database Creating and Converting

### 将图片集生成为训练用数据库

## Testcases

### Tiny testcase

### mnist