Hyperbox

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Hyperbox

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CHAPTER

ONE

安装过程

```` # clone project git clone https://github.com/ashleve/lightning-hydra-template cd lightning-hydra-template

# [OPTIONAL] create conda environment conda env create -f conda_env_gpu.yaml -n myenv conda activate myenv

# install requirements pip install -r requirements.txt

```

CHAPTER

TWO

# QUICK START

HyperBox 是工具包, 帮助用户设计神经网络架构搜索算法，是一款轻量级库，易于使用，便于扩展。

### HyperBox 核心支持

- Pytorch Lightning

Why PyTorch Lightning? PyTorch Lightning is a lightweight PyTorch wrapper for high-performance AI research. It makes your code neatly organized and provides lots of useful features, like ability to run model on CPU, GPU, multi-GPU cluster and TPU.

- Hydra

Why Hydra? Hydra is an open-source Python framework that simplifies the development of research and other complex applications. The key feature is the ability to dynamically create a hierarchical configuration by composition and override it through config files and the command line. It allows you to conveniently manage experiments and provides many useful plugins, like Optuna Sweeper for hyperparameter search, or Ray Launcher for running jobs on a cluster.

### HyperBox 重要概念

- Mutable 所有可变对象 - Space
  - CategoricalSpace 离散的空间
  - OperationSpace 候选操作组成的离散空间
  - InputSpace 可选的输入空间，从其中挑选某个作为输入
  - ValueSpace 更加细粒度的搜索空间，可以控制内部属性，比如 Conv 中的 kernel,channel 等属性。
  - Op 所有候选操作
- Mutator 主动改变 Mutable 对象或者其内部属性

CHAPTER

THREE

# 可变模块

整体架构:

```

├── configs <- Hydra configuration files │ ├── callbacks <- Callbacks configs │ ├── datamodule <- Datamodule configs │ ├── experiment <- Experiment configs │ ├── hparams_search <- Hyperparameter search configs │ ├── hydra <- Hydra related configs │ ├── logger <- Logger configs │ ├── model <- Model configs │ ├── trainer <- Trainer configs │ │ │ └── config.yaml <- Main project configuration file │ ├── data <- Project data │ ├── logs <- Logs generated by Hydra and PyTorch Lightning loggers │ ├── notebooks <- Jupyter notebooks. Naming convention is a number (for ordering), │ the creator' s initials, and a short - delimited description, e.g. │ *1.0-jqp-initial-data-exploration.ipynb*. │ ├── tests <- Tests of any kind │ ├── smoke │ └── unit │ ├── src │ ├── callbacks <- Lightning callbacks │ ├── datamodules <- Lightning datamodules │ ├── models <- Lightning models │ ├── utils <- Utility scripts │ │ │ └── train.py <- Training pipeline │ ├── run.py <- Run any pipeline with chosen experiment configuration │ ├── .env.example <- Template of the file for storing private environment variables ├── .gitignore <- List of files/folders ignored by git ├── .pre-commit-config.yaml <- Configuration of automatic code formatting ├── conda_env_gpu.yaml <- File for installing conda environment ├── Dockerfile <- File for building docker container ├── requirements.txt <- File for installing python dependencies ├── setup.cgf <- Configurations of linters and pytest ├── LICENSE └── README.md

```

## 3.1 可变模块介绍

可变模块介绍

## 3.2 OperationSpace

这是 OperationSpace

## 3.3 InputSpace

这是 InputSpace

## 3.4 ValueSpace

这是 ValueSpace

CHAPTER

# FOUR

# 神经网络搜索算法

目前支持的神经网络搜索算法有：

## 4.1 ENAS

## 4.2 DARTS

## 4.3 Random NAS

CHAPTER

FIVE

# 关于

Hyperbox is an AutoML framework.

CHAPTER

SIX

# INDICES AND TABLES

- genindex
- modindex
- search