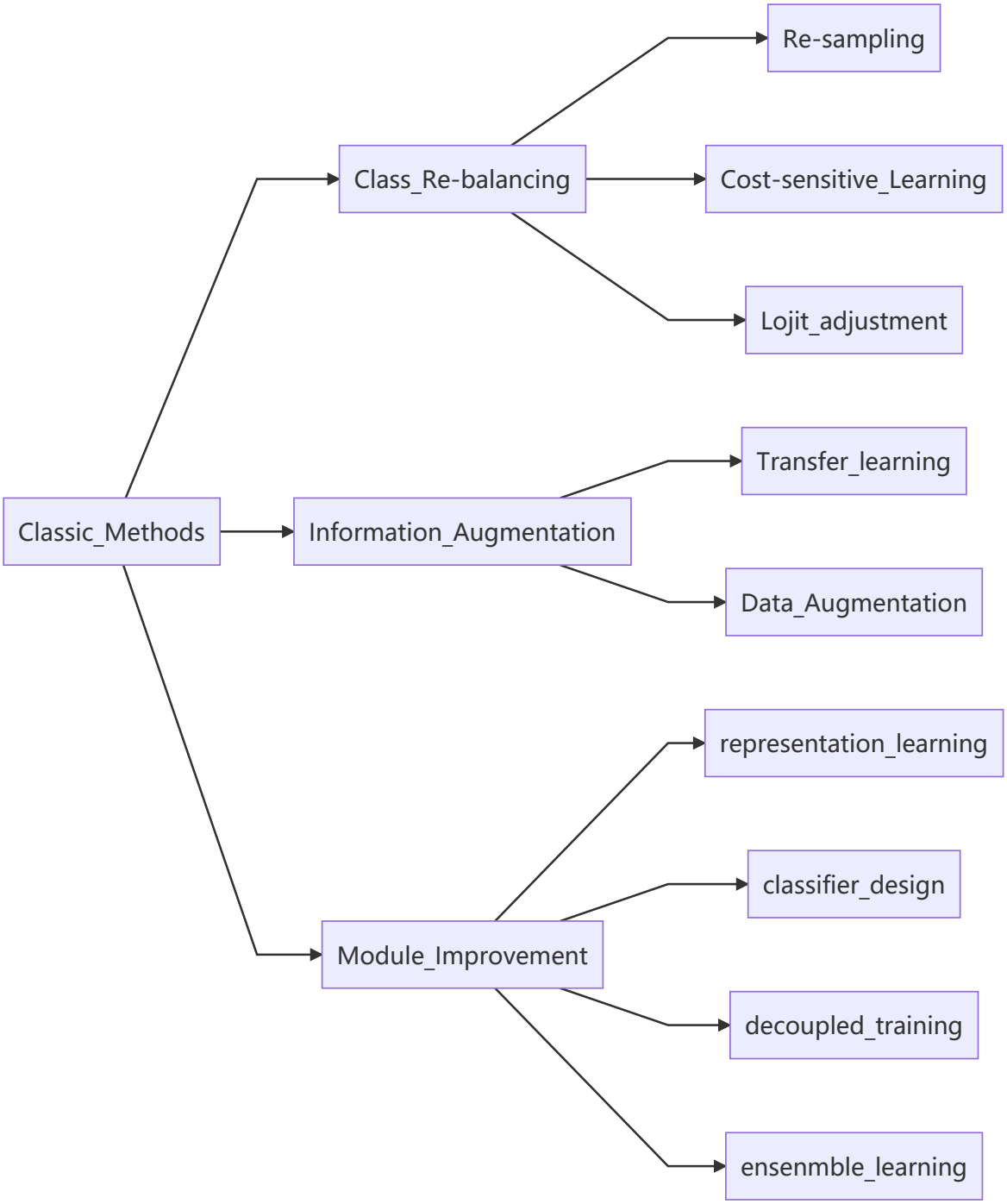
Deep Long-Tailed Learning-A Survey

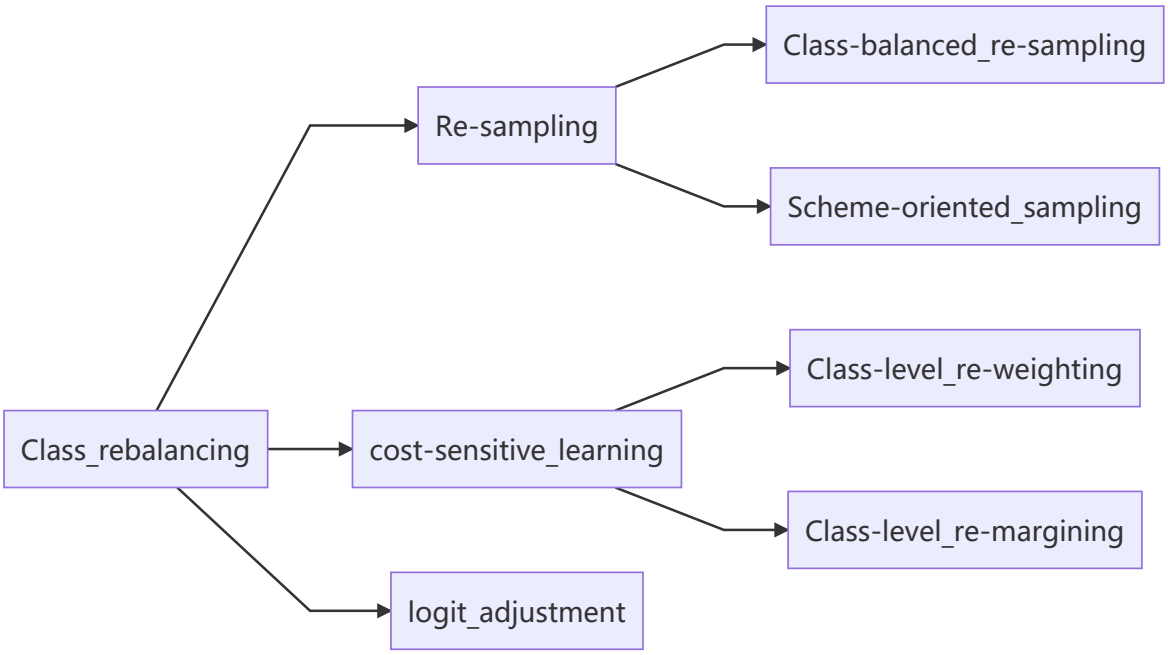
论文中提到的几类经典方法已经整理好，具体的分类见笔记的Appendix（每一个具体的方法都有一些标签，方便查阅；此外里面的论文往往用了很多种trick，所以有一篇文章在多个类下面的情况）。

大家可以根据自己需求修改下面的流程图，用 Typora 打开，使用的脚本语言是 mermaid , 修改每个流程图对应上的LR即可切换流程图方向（LR是从左到右，RL是从右到左，BT是从上到小，TB是从下到上）。

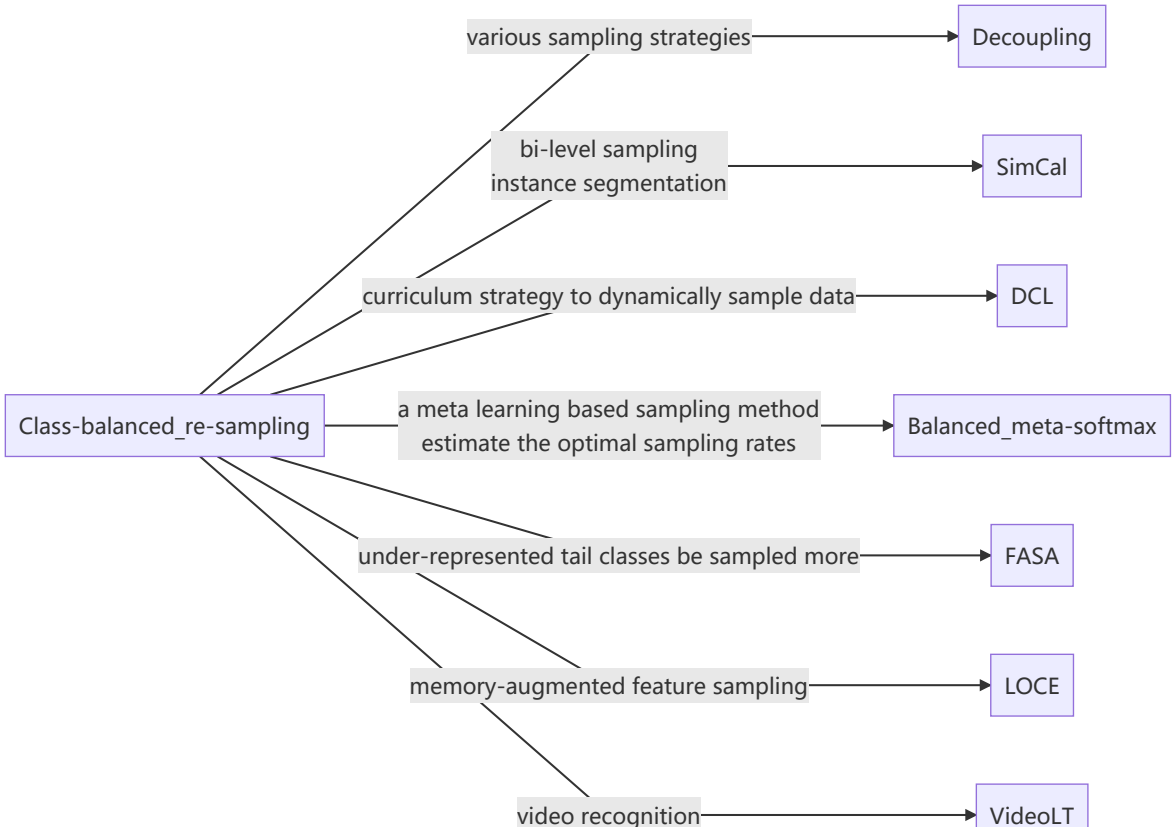
Appendix - CLASSIC METHODS

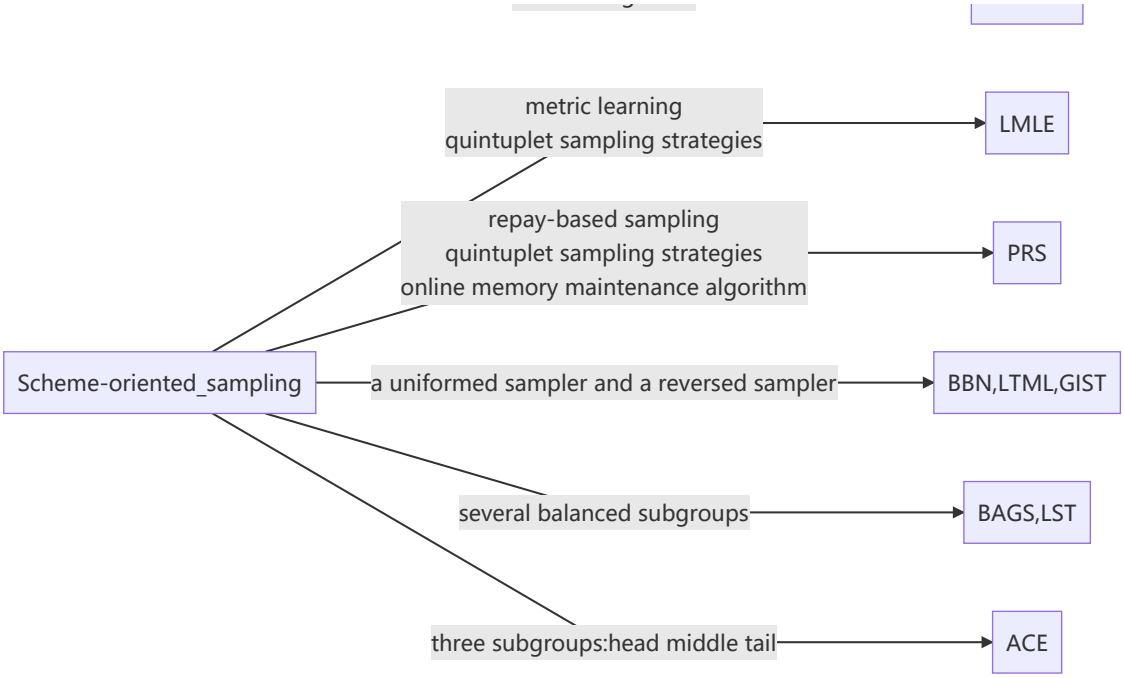


- **Class Re-balancing**

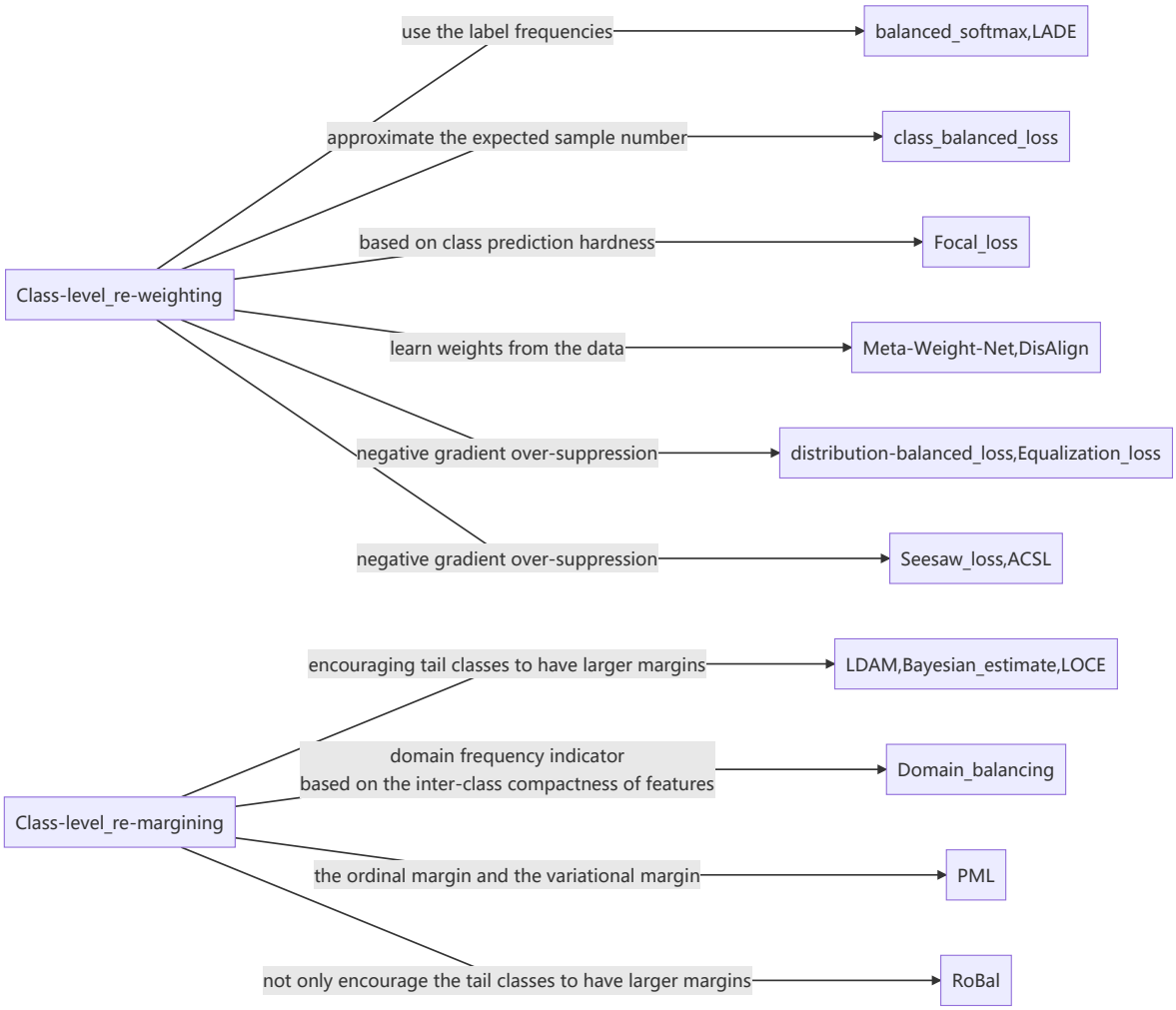

Class_rebalancing
Re-sampling
Class-balanced_re-sampling
Scheme-oriented_sampling
cost-sensitive_learning
Class-level_re-weighting
Class-level_re-margining
logit_adjustment

- **Re-sampling**

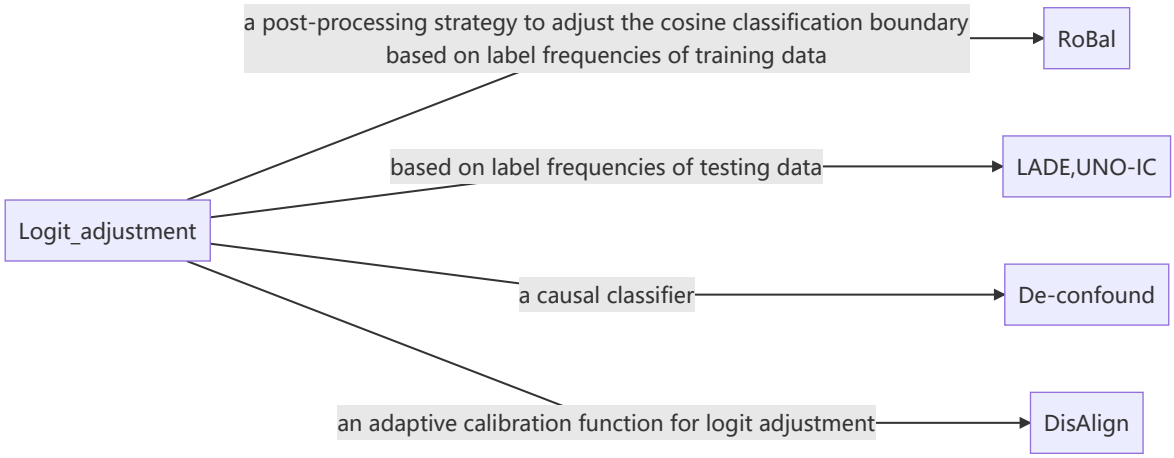

Class-balanced_re-sampling
various sampling strategies
Decoupling
bi-level sampling
instance segmentation
SimCal
curriculum strategy to dynamically sample data
DCL
a meta learning based sampling method
estimate the optimal sampling rates
Balanced_meta-softmax
under-represented tail classes be sampled more
FASA
memory-augmented feature sampling
LOCE
video recognition
VideoLT



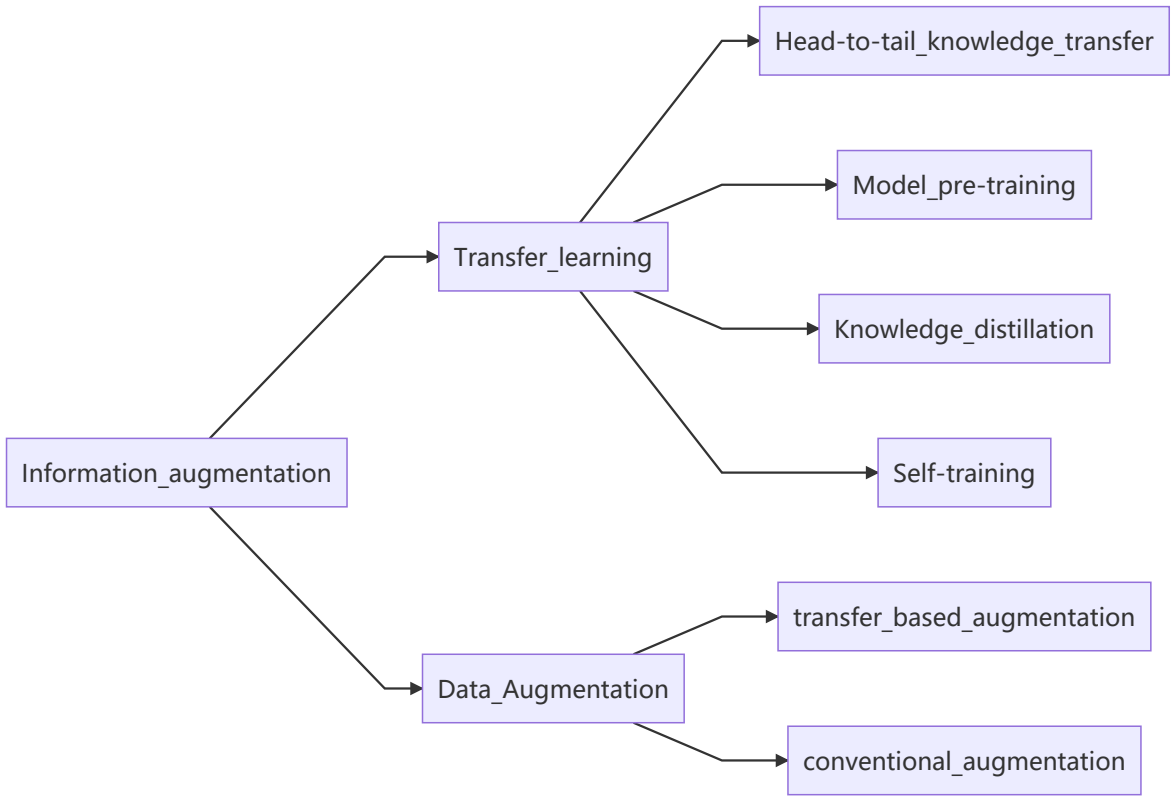
- **cost-sensitive learning**


Class-level_re-weighting
use the label frequencies
balanced_softmax,LADE
approximate the expected sample number
class_balanced_loss
based on class prediction hardness
Focal_loss
learn weights from the data
Meta-Weight-Net,DisAlign
negative gradient over-suppression
distribution-balanced_loss,Equalization_loss
negative gradient over-suppression
Seesaw_loss,ACSL
Class-level_re-margining
encouraging tail classes to have larger margins
LDAM,Bayesian_estimate,LOCE
domain frequency indicator
based on the inter-class compactness of features
Domain_balancing
the ordinal margin and the variational margin
PML
not only encourage the tail classes to have larger margins
RoBal

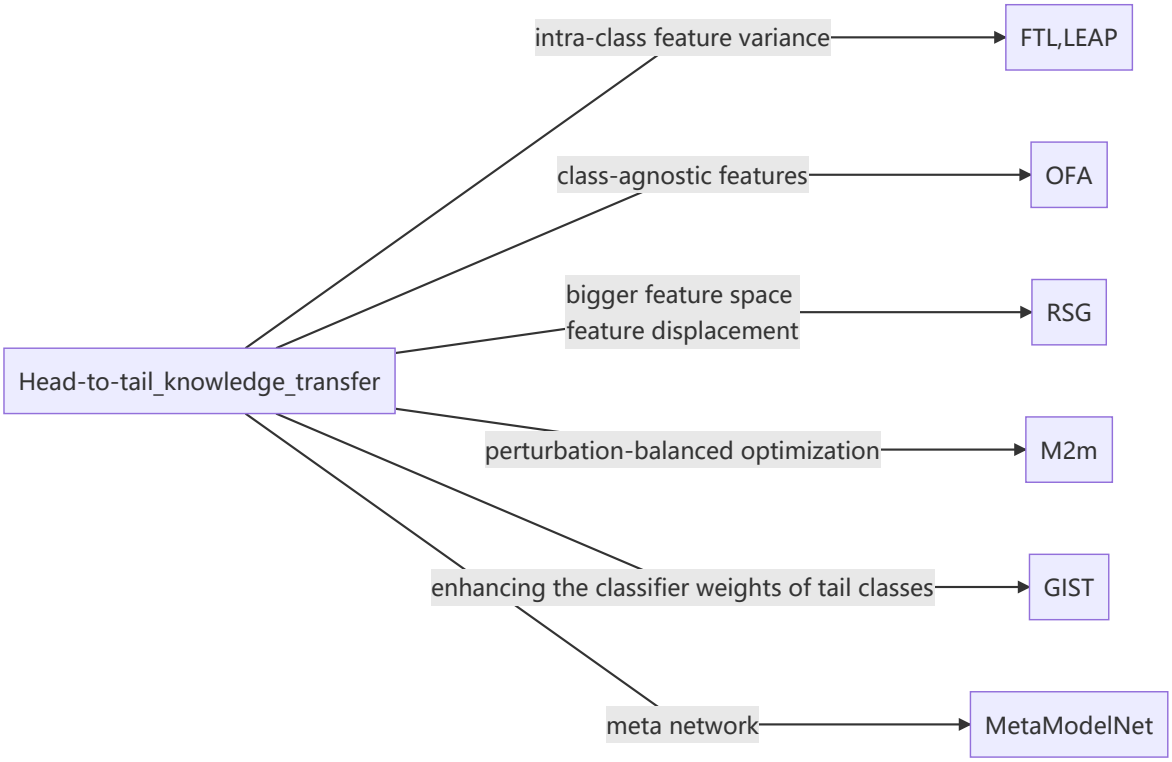
- **Logit adjustment**

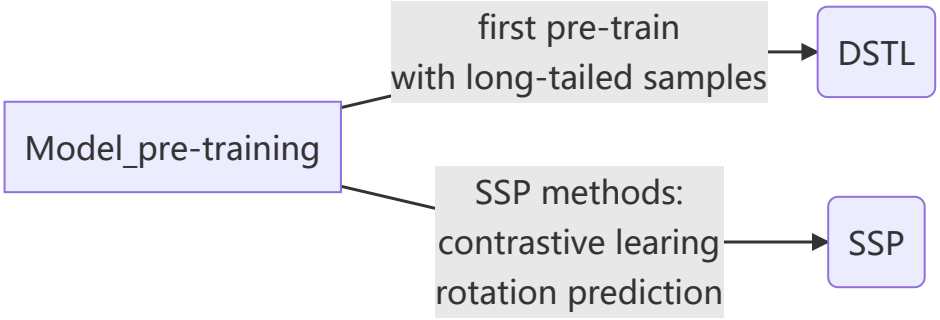


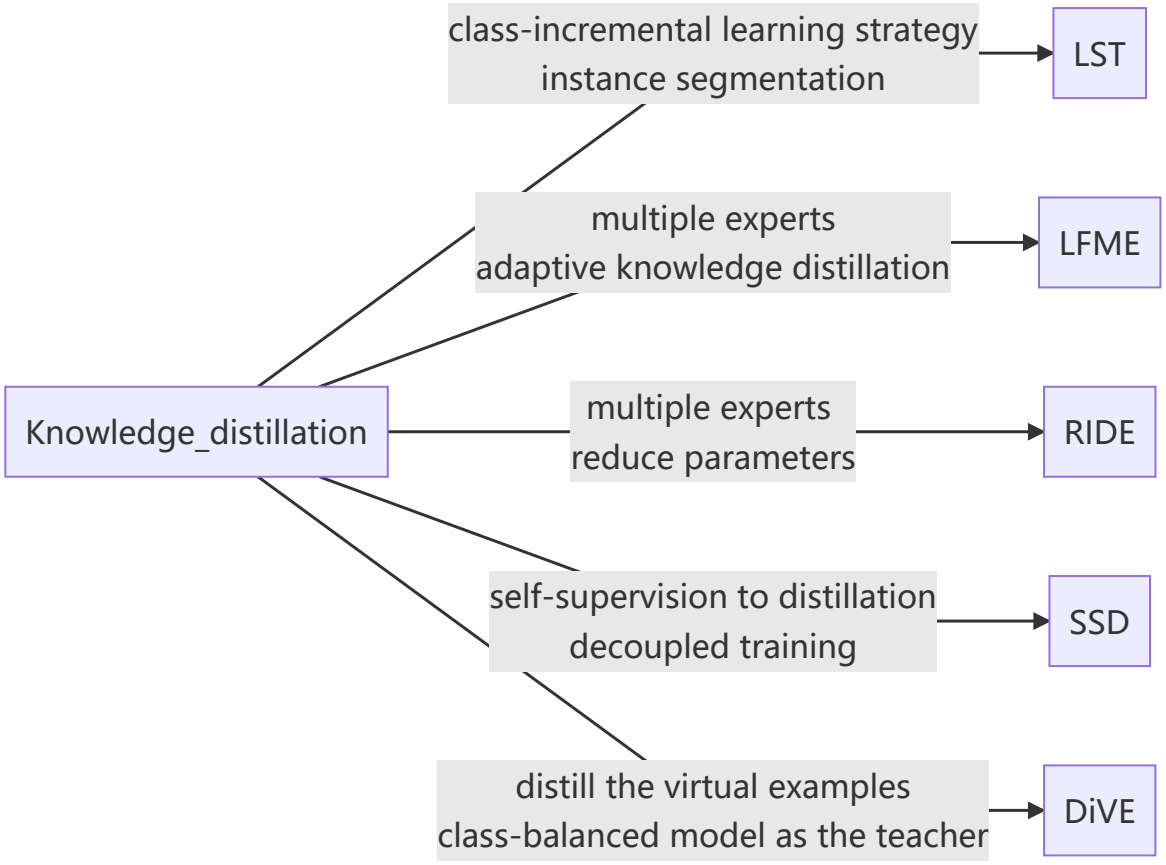
- **Information augmentation**

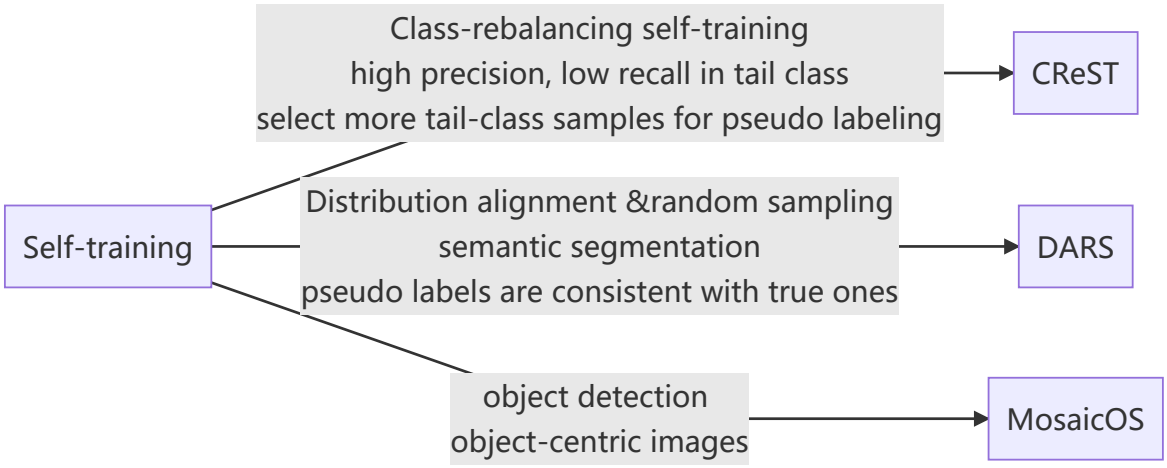


- **Transfer Learning**

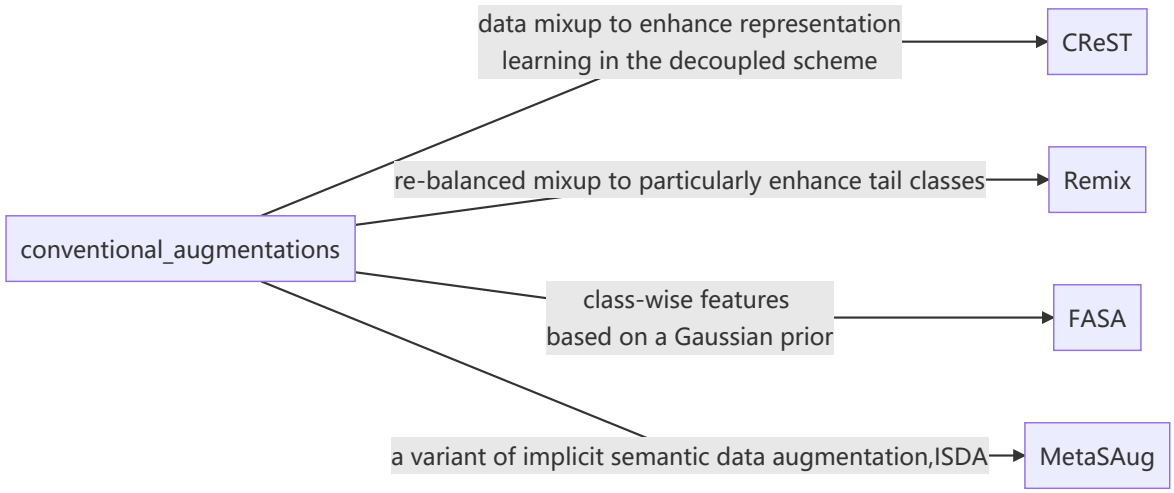




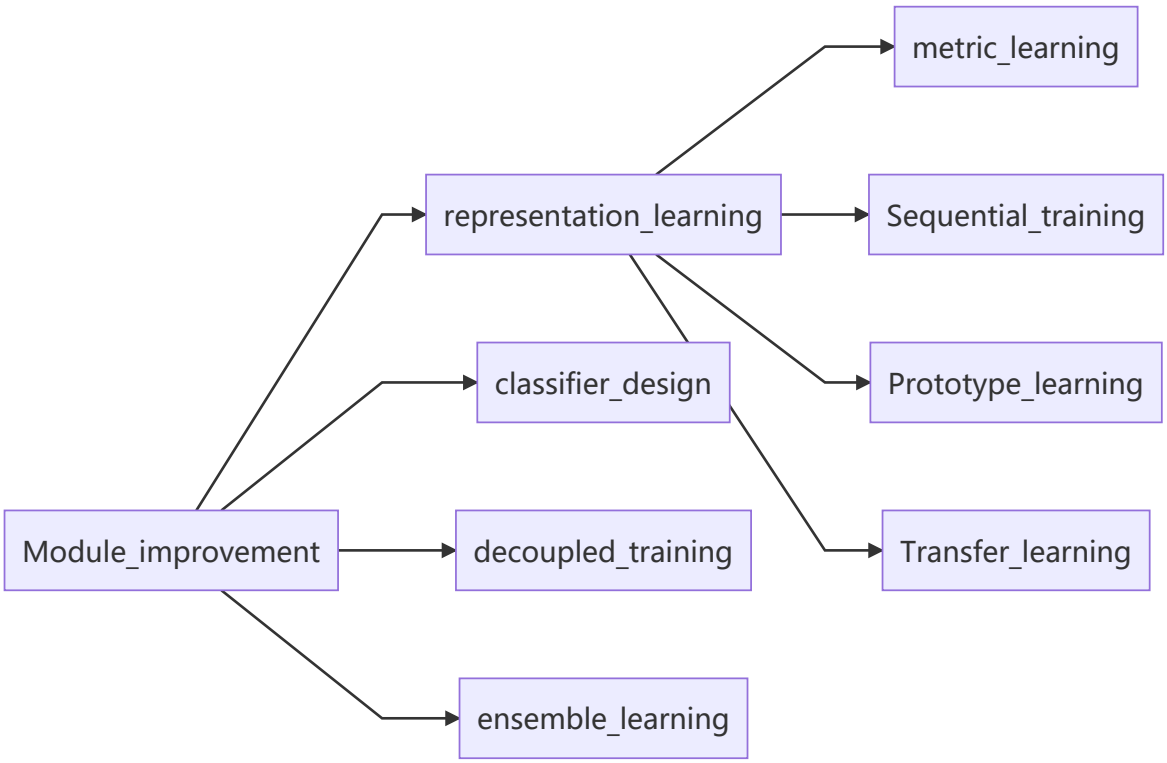




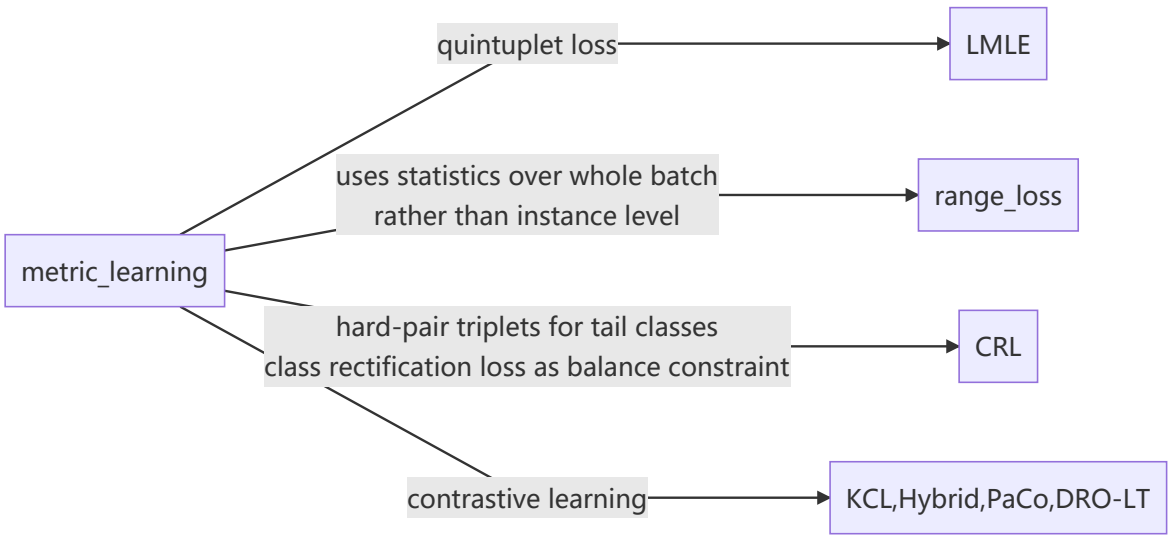
- **Data Augmentation**

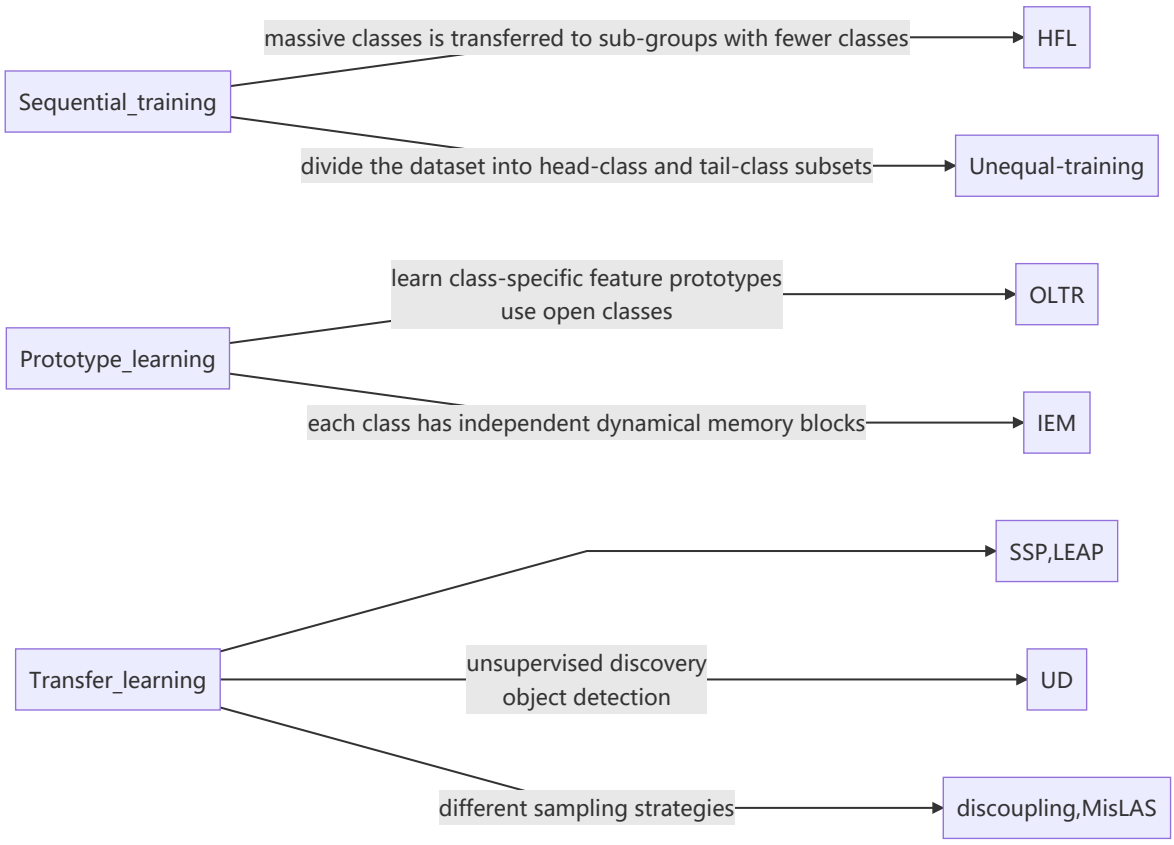


- **Module improvement**

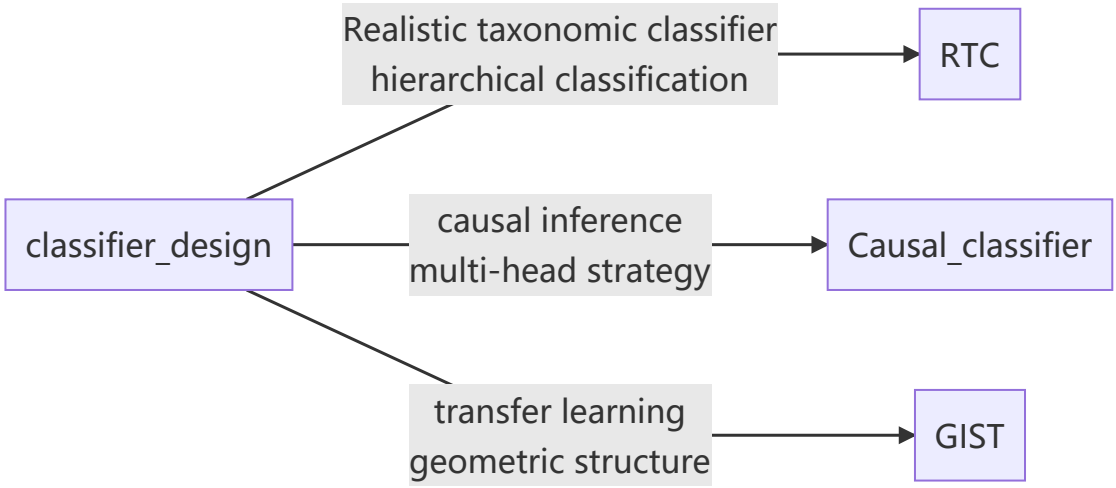


- **representation learning improves the feature extractor**

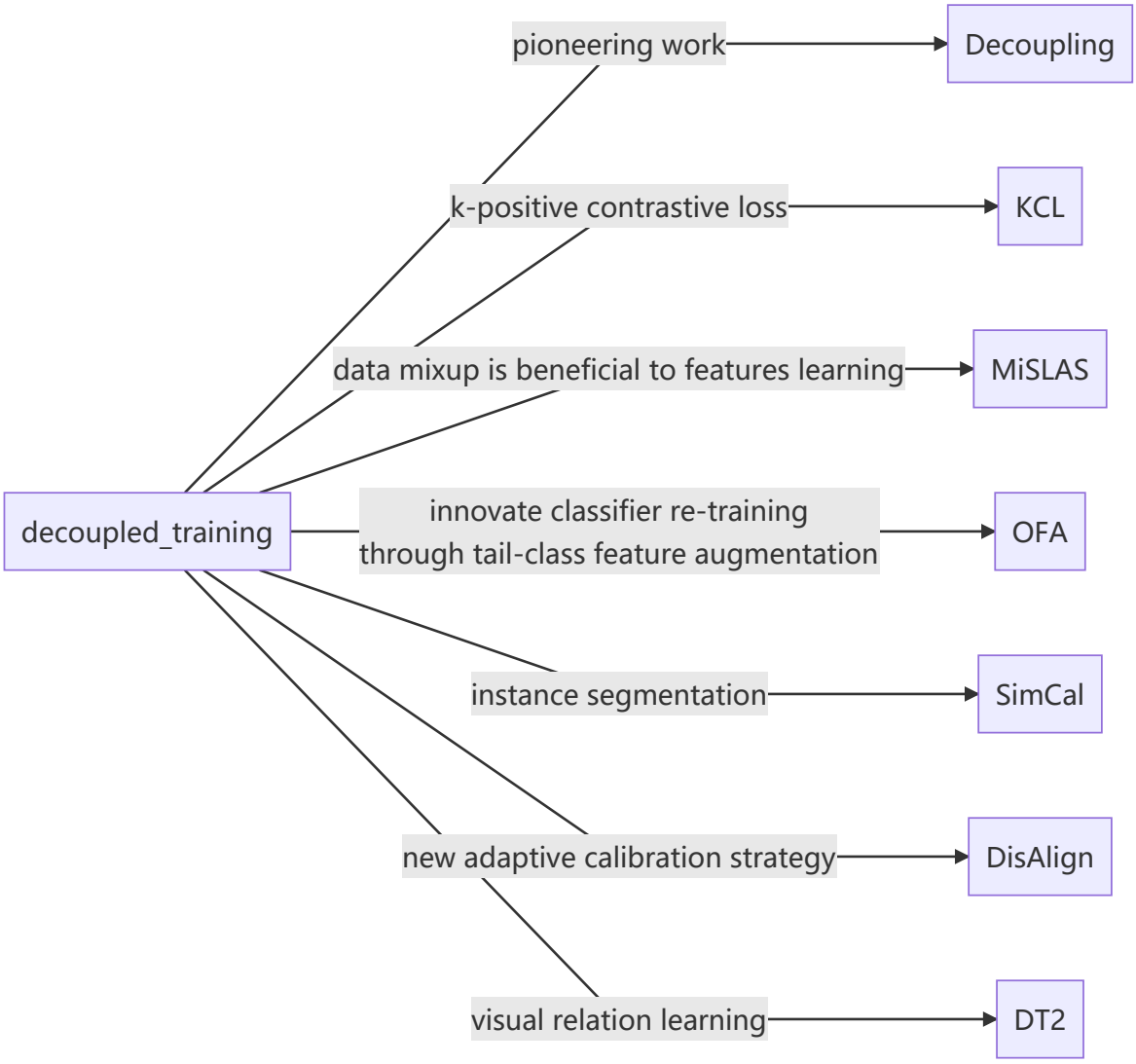

metric_learning
quintuplet loss
LMLE
uses statistics over whole batch
rather than instance level
range_loss
hard-pair triplets for tail classes
class rectification loss as balance constraint
CRL
contrastive learning
KCL,Hybrid,PaCo,DRO-LT


Sequential_training
massive classes is transferred to sub-groups with fewer classes
HFL
divide the dataset into head-class and tail-class subsets
Unequal-training
Prototype_learning
learn class-specific feature prototypes
use open classes
OLTR
each class has independent dynamical memory blocks
IEM
Transfer_learning
SSP,LEAP
unsupervised discovery
object detection
UD
different sampling strategies
discoupling,MisLAS

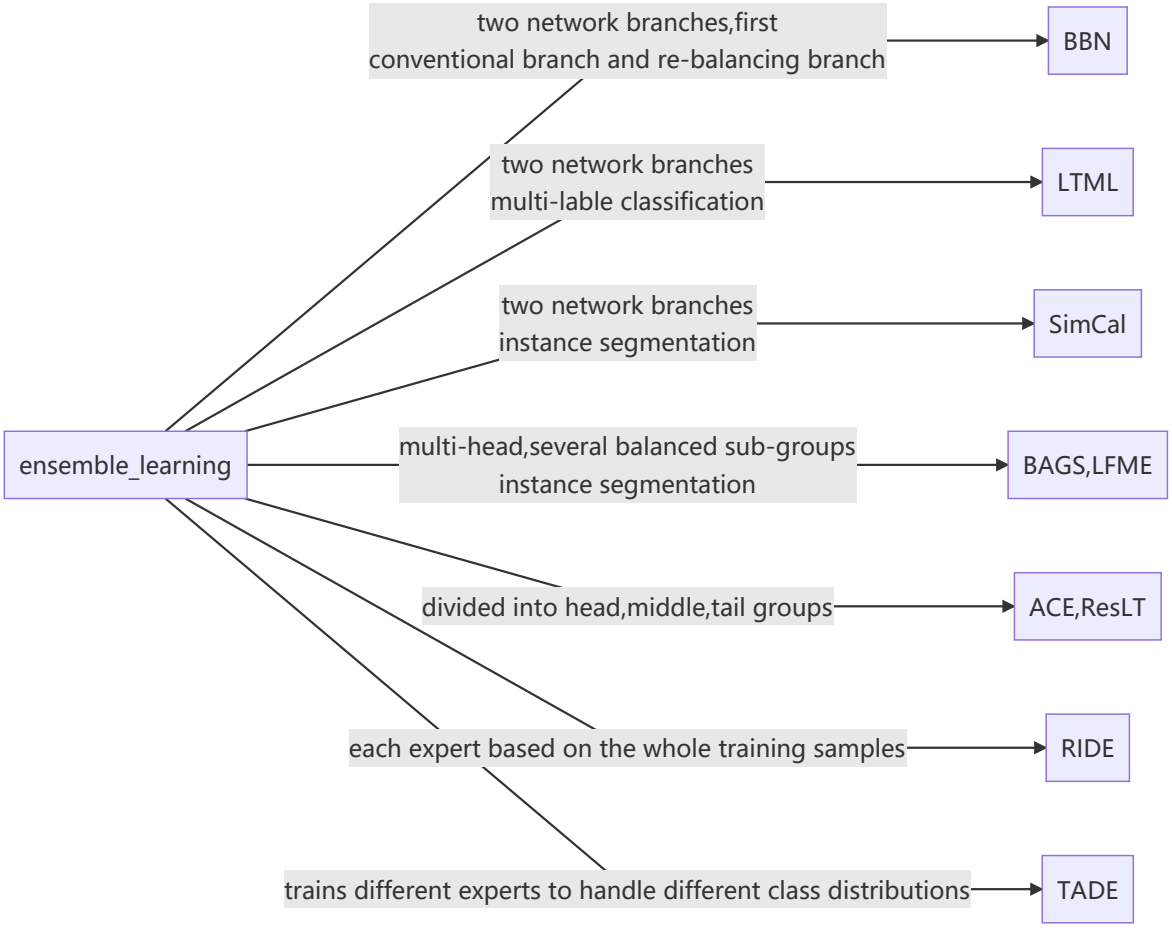
- **classifier design enhances the model classifier**



- **decoupled training boosts the learning of both the feature extractor and the classifier**



- **ensemble learning improves the whole architecture**


ensemble_learning
two network branches,first conventional branch and re-balancing branch
BBN
two network branches multi-lable classification
LTML
two network branches instance segmentation
SimCal
multi-head,several balanced sub-groups instance segmentation
BAGS,LFME
divided into head,middle,tail groups
ACE,ResLT
each expert based on the whole training samples
RIDE
trains different experts to handle different class distributions
TADE