

Discussion about the result of CS-Net Ablation Exp

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当前存在的问题描述

- 消融实验已经完成，确认 Baseline+CCM 的结果没有问题。确实是 Baseline+CCM 效果全面优于 Baseline+CCM+SAE
- 我们对 SAE 模块作出修改（类似于残差链接，原来相当于 x 经过 SAE 的结果是 $f(x)$ ，现在我们让它变成 $f(x) + x$ 。效果确有提升，但还是比不上 Baseline+CCM
- 如果去掉 SAE，我们的创新性是否容易在 Rebuttal 阶段被质疑？

关于 SAE 模块效果差的讨论

- SAE 模块可能会干扰 CCM 模块强制执行的一致性和相关性
- SAE 模块的 Attention 机制虽然可以关注到局部细节，但是可能会破坏 CCM 模块追求的全局一致性

新 SAE Module 架构示意图

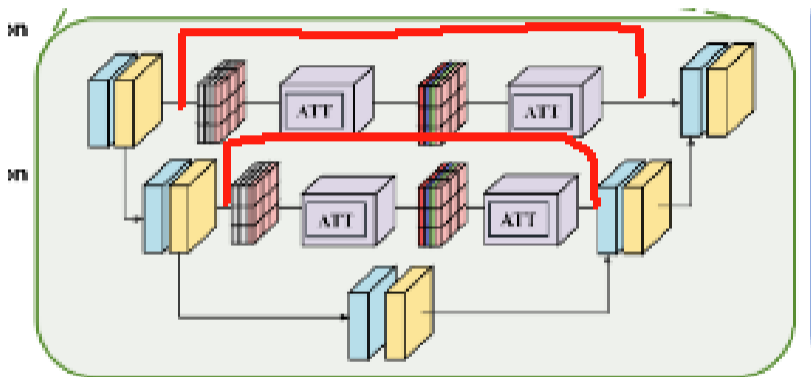


图: 新 SAE 架构示意图

CAML MICCAI 审稿意见问题总结: 与 CCM Module 相关

- Previous work on semi-supervised learning used memory banks [1]. The authors should highlight how their method differs from theirs
- How is the memory bank updated? Is it updated through exponential moving average? It is not provided in the manuscript.
- The formulations of your consistency regularization are also very similar to that of [1], which heavily limits the novelty of this paper. The authors should discuss [1] in the revision and highlight the difference.

CAML MICCAI 审稿意见问题总结: 与 CCM Module 相关

- 以上三个问题鉴于我们的 CCM Module 采用了新的 CORAL Constancy 计算方法, 不存在 Novelty 的问题
- Formulation 和 Memory Bank (Dynamic Feature Pool) 的更新方法我们也有创新, 并且在 Method 有详细描述

CAML MICCAI 审稿意见问题总结: 与 SAE Module 相关

- The justification for only applying CMA in the auxiliary model, and not applying CMA to both the vanilla and auxiliary model is not provided. Or the ablation study should be conducted for that.
- Compared to the detailed explanation of OCC, the formulation and definition of CMA were not provided clearly
- Do you require spatial alignment for the CMA? Does the inter-sample self-attention only work under the assumption that the data have the exact same field of view and are anatomically aligned? If so, it should be included as a limitation in the conclusion.

原作者意见

- 为什么只在 Auxiliary Model 应用 CMA Module:
 - The insertion of the CMA module requires a batch size of large than 1 to model the attention among samples within a mini-batch. For model inference, we still need a vanilla V-Net to inference each sample independently (batchsize=1).
 - We model the vanilla and the auxiliary branch with different architectures to increase the architecture heterogeneous for better performance in a mutual learning framework.
- 为什么没清晰地给出 CMA 的计算公式和定义?
 - 在 Sec 2.2 给出详细介绍
 - 已经提供模型架构图和代码
- 为什么没有空间对齐?
 - The CMA module does not require spatial alignment.

CAML MICCAI 审稿意见问题总结：与整体架构相关

- My biggest concern is that the main idea is very similar to [1]. [1] is the first to utilize the reliable information of labeled images to guide the learning of unlabeled images. However, it is not discussed in this paper. And the formulations of your consistency regularization are also very similar to that of [1], which heavily limits the novelty of this paper. The authors should discuss [1] in the revision and highlight the difference.
- The implementation is based on CPS [2]. But the results of CPS are not presented in the experiments. I think CPS can be easily employed to this task, is it right?

相关文章

- ① Querying Labeled for Unlabeled: CrossImage Semantic Consistency Guided Semi-Supervised Semantic Segmentation. (TPAMI 2022) [1]
- ② Semi-Supervised Semantic Segmentation with Cross Pseudo Supervision (CVPR 2021) [2]

原作者意见

- 与 [1] 的关系：
 - CAML adopts a cross pseudo-supervision (CPS) framework, which is an end-to-end approach, whereas CISC-R follows a multi-stage self-training framework.
 - Instead of directly revising the embedded features of unlabeled data, the OCC module in CAML constrains the omni-correlation matrix of each sub-model to ensure consistency throughout the framework.
- 与 CPS 的关系：
 - 他们是在 MC-Net 上进行比较的。MC-Net 是基于 CPS 的，但是进行了有效的改动。所以没有必要与 CPS 进行比较。

- Ablation Exp: VNet, VNet+DFP, VNet+CC, VNet+CCM
- 行文上就着重考虑为什么 CCM 是个更合理的结构

一些细节

- VNet + CC 这一组怎么做?
- 伍导的一种方案：随机 Vector 替代原本从 DFP 中选取的 Vector