**Title:**

**Basic:**

**Question:**

**Data:**

**Method:**

[**Evaluation**](javascript:;)**:**

**Advantage/Disadvantage:**

Advantage:

Disadvantage:

**Result:**

**Code:**

**Future Work:**

**Title:**

**AffinityNet: Semi-supervised Few-shot Learning forDisease Type Prediction**

**Basic:Biology**

[x].Ma, T., & Zhang, A. (2019). AffinityNet: Semi-Supervised Few-Shot Learning for Disease Type Prediction. *Proceedings of the AAAI Conference on Artificial Intelligence*, *33*, 1069–1076. https://doi.org/10.1609/aaai.v33i01.33011069

**Question:**

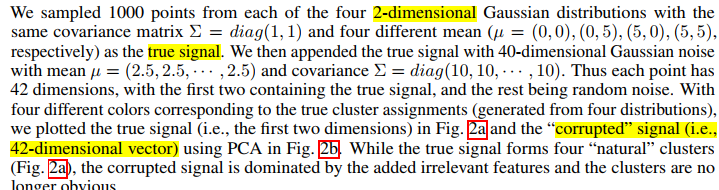
**1.癌症分类**

**2.癌症生存率估计**

**Data:**

**实验1：**

**42维特征向量=2维特征+40维高斯噪声，**

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**数据集情况：**

**4个类，4000个样本**

**实验2:**

**url:** [**https://portal.gdc.cancer.gov**](https://portal.gdc.cancer.gov)

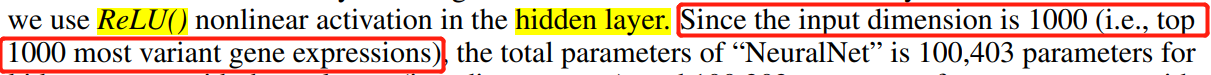
****

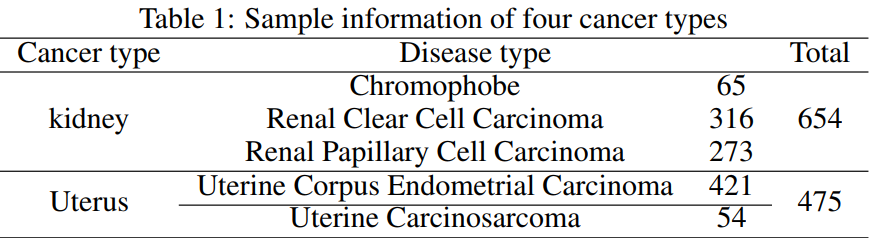
**数据集相关文献**

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**数据集情况：**

**每个样本1000维**



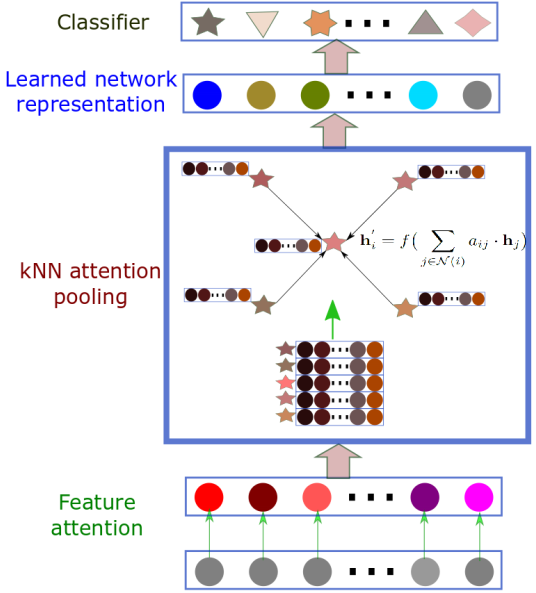


**实验3：**

**使用实验2中kindey数据集**

**Method:**

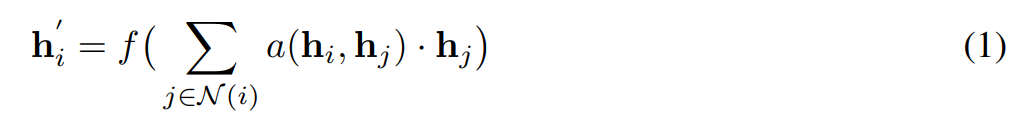
**模型架构:**



**1.Similarity graph 构造**

**2.KNN attention pooling layer**

**(1).节点表达：**

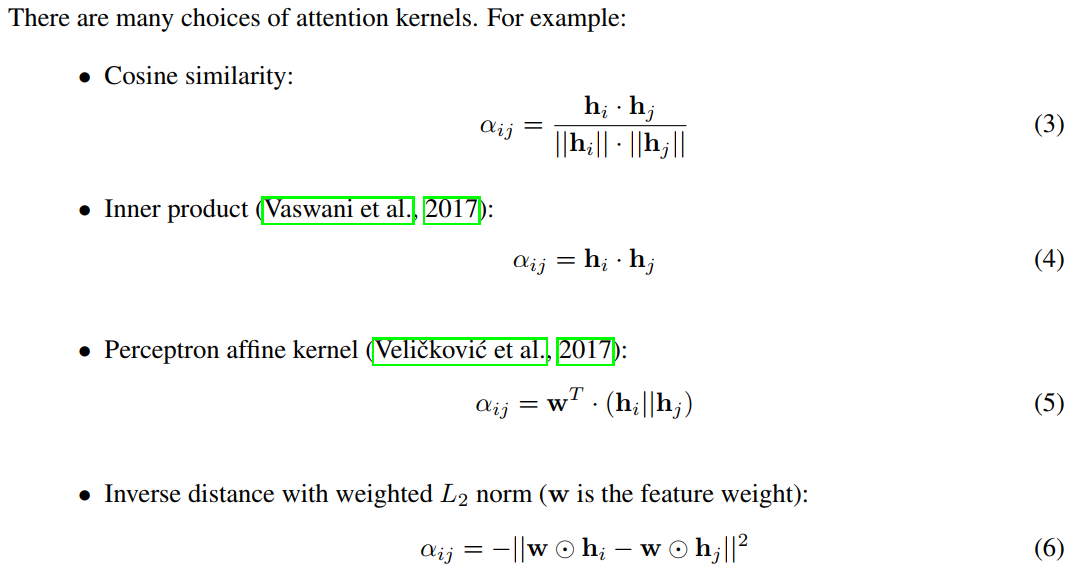


**(2).注意力机制：**



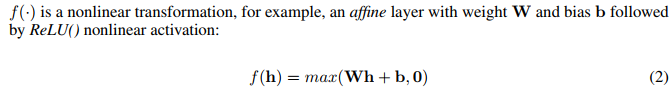








**(3).Relu激活函数：**



**(4).KNN Pooling操作：**

**对图规模大且节点具有高度的邻居节点选择，基于KNN思想，选择中心节点相似度最高的k个邻居节点聚合。**



**pooling在图像特征提取中的作用：**

**1.增加平移不变性**

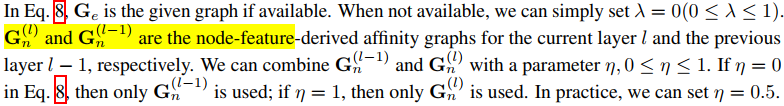
**2.保留主要特征/减少模型训练参数**

**本文pooling操作体现在基于attention kernel计算central node 与 neighbor nodes的similarity ,并以similarity来选择 k 个neighbor nodes起到减少central node聚合neighbor nodes数量的以达到类似图像pooling中第二个作用。**

**(5).Dynamic affinity graph操作：**

**每层图节点表示考了原始图节点表示，上一层图节点表示**





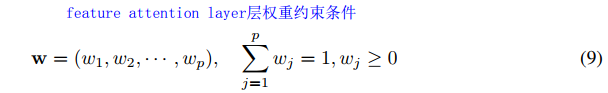
**4.Feature Attention Layer**

**通过有监督信号，对样本特征进行筛选**

**(1).节点表达**



**(2).权重约束**

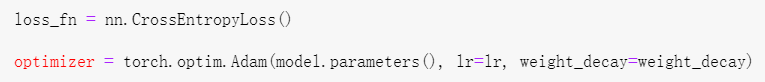


**5.Semi-supervised few-shot learning机制**

**6.损失函数与优化函数**

**损失函数交叉熵损失**

**优化函数：Adam**



[**Evaluation**](javascript:;)**:**

**实验1：**

**1.training loss值**

**2.AUC**

**3.feature attention layer特征选择评估**

**实验2：**

**AMI评估**

**(https://www.jianshu.com/p/b9528df2f57a)**

**实验3：**

**1.Concordance index: 主要用于计算生存分析中的COX模型预测值与真实之间的区分度(https://www.jianshu.com/p/5e648f0f49ed)**

**2.基于Wilcoxon signed rank test的P值检验**

**3.Kaplan-Meier生存估计(https://zhuanlan.zhihu.com/p/97645982)**

**Advantage/Disadvantage:**

Advantage:

**1.数据组织：将独立非图结构数据依据相似度构图思想以图的形式进行组织并使用GAT对图数据进行融合表示；**

**2.卷积域选择：使用KNN思想选择卷积域范围并可实现每层卷积动态选择卷积域内邻居节点；**

**3.提出一种卷积层图表示融合的机制，增强卷积过程中图表示的平滑度；**

**4.加入单个样本特征选择机制并融入训练中学习选择权重；**

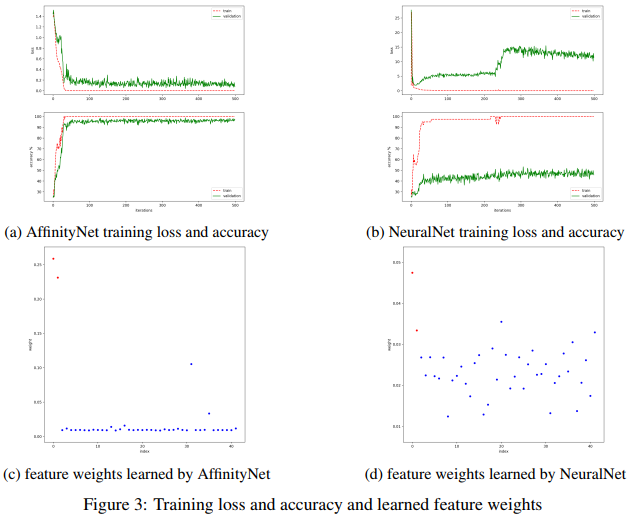
**5.基于训练好的特征选择器，定义聚类/分类计算中的相似度计算**

Disadvantage:

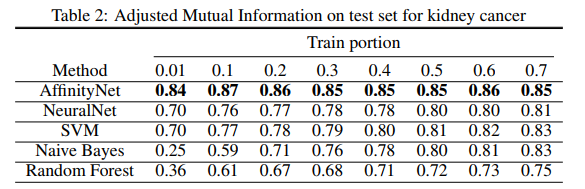
**1.对图结构数据挖掘没有特别优势**

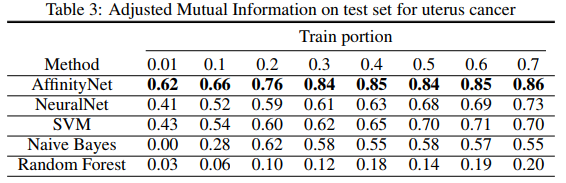
**Result:**

**实验1：**

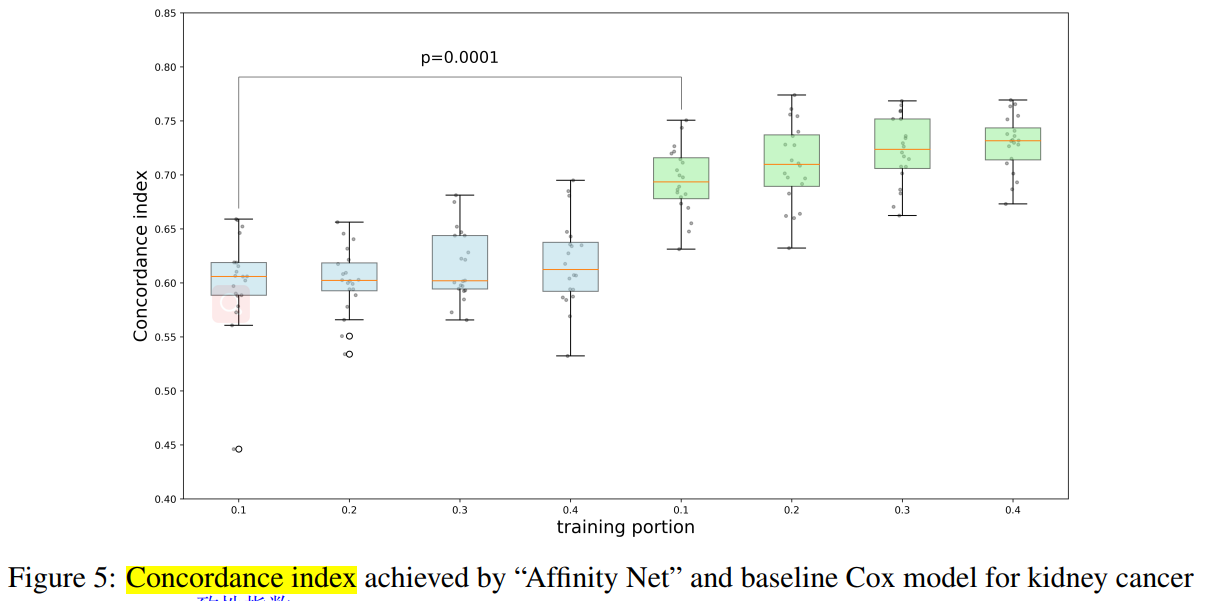


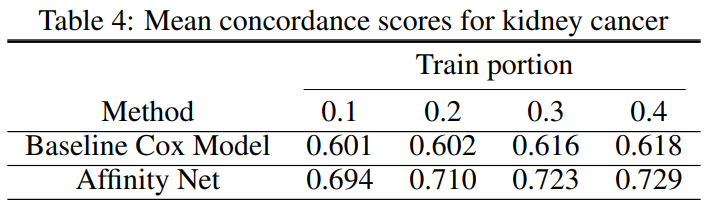
**实验2：**

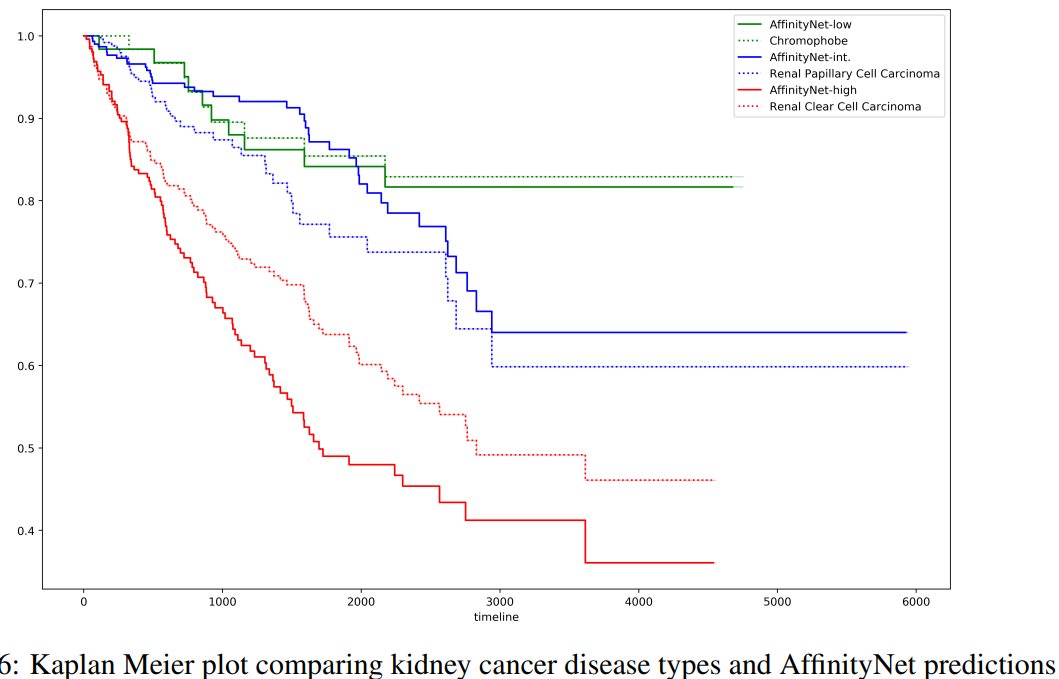




**试验3：**







**Code:可运行**

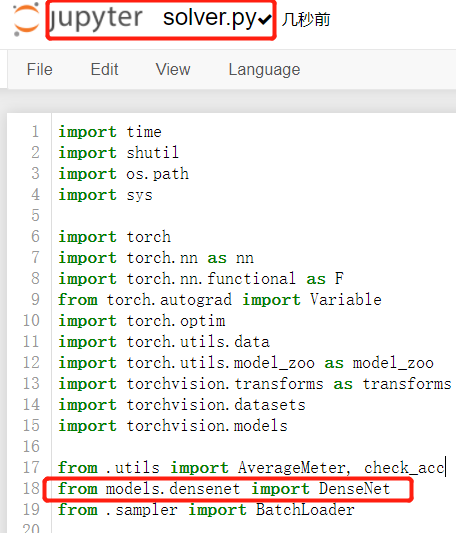
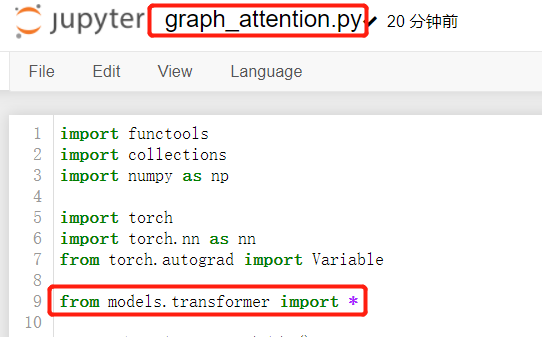
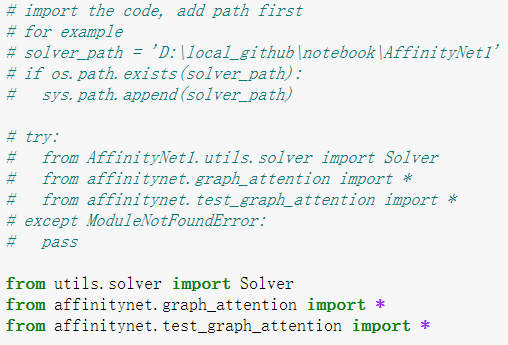
**url：https://github.com/BeautyOfWeb/AffinityNet.**

**复现实验1：**

**对比在不同比例训练情况下模型AUC与样本特征选择器效果**

****

**原始脚本修改：**



**Future Work:**

**Title:**

**GraphNAS: Graph Neural Architecture Search with Reinforcement Learning**

**Basic: Reinforcement Learning**

[x].Gao, Y., Yang, H., Zhang, P., Zhou, C., & Hu, Y. (2019). *GraphNAS: Graph Neural Architecture Search with Reinforcement Learning*. *April*. http://arxiv.org/abs/1904.09981

**Question:**

**Data:**

**Method:**

[**Evaluation**](javascript:;)**:**

**Advantage/Disadvantage:**

Advantage:

Disadvantage:

**Result:**

**Code:**

**Future Work:**