

第十周周报

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本周完成工作

- 学习图神经网络
- 阅读 A Gentle Introduction to Graph Neural Networks <https://distill.pub/2021/gnn-intro/>
- 完成GCN在Cora上的节点分类实践

The screenshot shows a code editor interface with a file tree on the left and a terminal window on the right.

File Tree:

- 直接运行文件夹 (.venv)
 - directly_train_with_wine.py
 - main.py
- Week1.md
- NeuralNetwork
 - .idea
 - .venv
 - app.py
 - words.py
- paly_2048_gym_by_RL
- Report
 - .vscode
 - Week1
 - Week2
 - Week3
 - Week4
 - Week5
 - Week6
 - Week7
 - Week9
 - Week10
- RL
- 外部库

Terminal (gnn):

```
24 model = GCN()
25 optimizer = torch.optim.Adam(model.parameters(), lr=0.01, weight_decay=5e-4)
26
27 # 训练模型
28 model.train()
29 for epoch in range(200):
30     optimizer.zero_grad()
31     out = model(data)
32     loss = F.nll_loss(out[data.train_mask], data.y[data.train_mask])
33     loss.backward()
34     optimizer.step()
35     if epoch % 20 == 0:
36         print(f"Epoch {epoch}, Loss: {loss.item():.4f}")
37
38 model.eval()
39 _, pred = model(data).max(dim=1)
40 correct = int((pred[data.test_mask] == data.y[data.test_mask]).sum())
41 acc = correct / int(data.test_mask.sum())
42 print(f'Test Accuracy: {acc:.4f}')
43 |
```

输出：

```
Epoch 40, Loss: 0.0143
Epoch 60, Loss: 0.0151
Epoch 80, Loss: 0.0178
Epoch 100, Loss: 0.0163
Epoch 120, Loss: 0.0144
Epoch 140, Loss: 0.0131
Epoch 160, Loss: 0.0121
Epoch 180, Loss: 0.0112
Test Accuracy: 0.8080
```

下周学习规划

- 结合capsule项目进一步了解图神经网络的应用，完成图神经网络的学习

学习进度

- 数据集划分
 - 交叉验证
 - 过拟合防范
 - 评估指标（如 AUC、RMSE、Rp）
- 深度学习基础

- 前向传播
- 反向传播
- 损失函数 (如交叉熵、均方误差)
- 梯度下降法
- 图神经网络
 - GNN
 - GCN
 - GAN
 - 在图数据 (如分子图) 上提取特征
- 卷积神经网络 (CNN)
 - 卷积层: 卷积操作、滤波器、步幅、填充
 - 池化层: 最大池化、平均池化
 - 激活函数: ReLU、Sigmoid 等
 - 全连接层: 特征映射到输出
 - CNN 架构: LeNet、AlexNet、VGG、ResNet