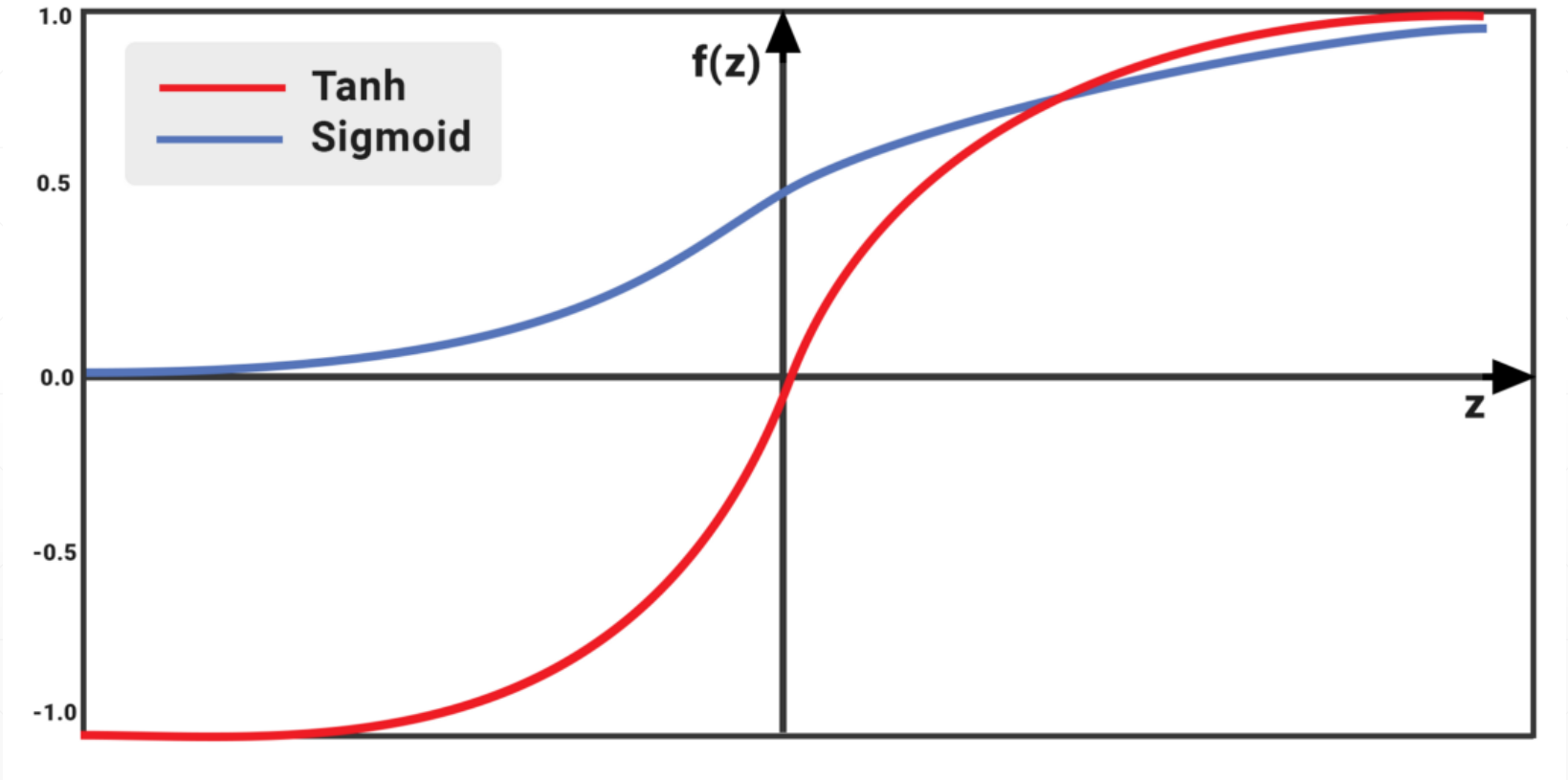
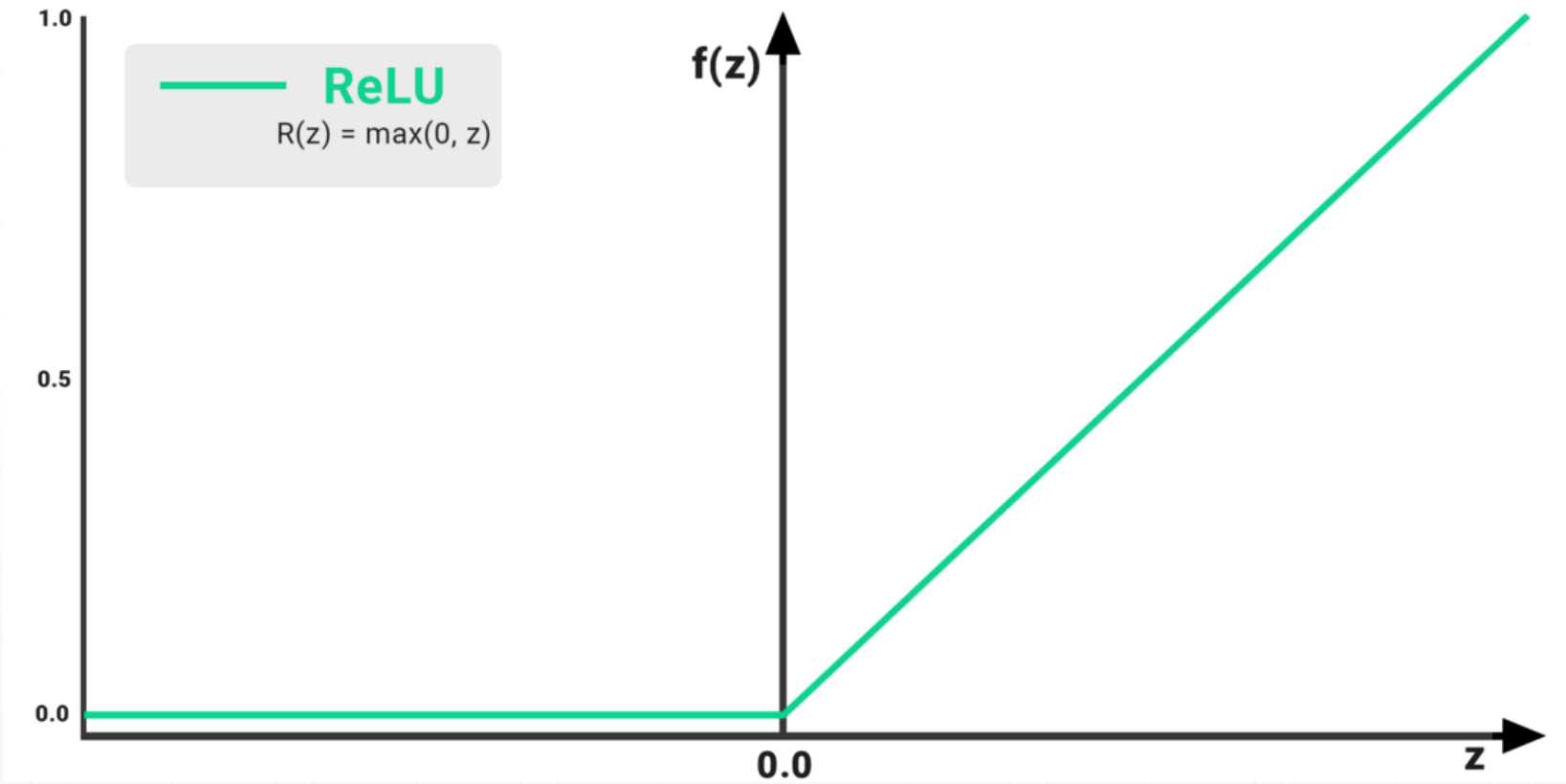
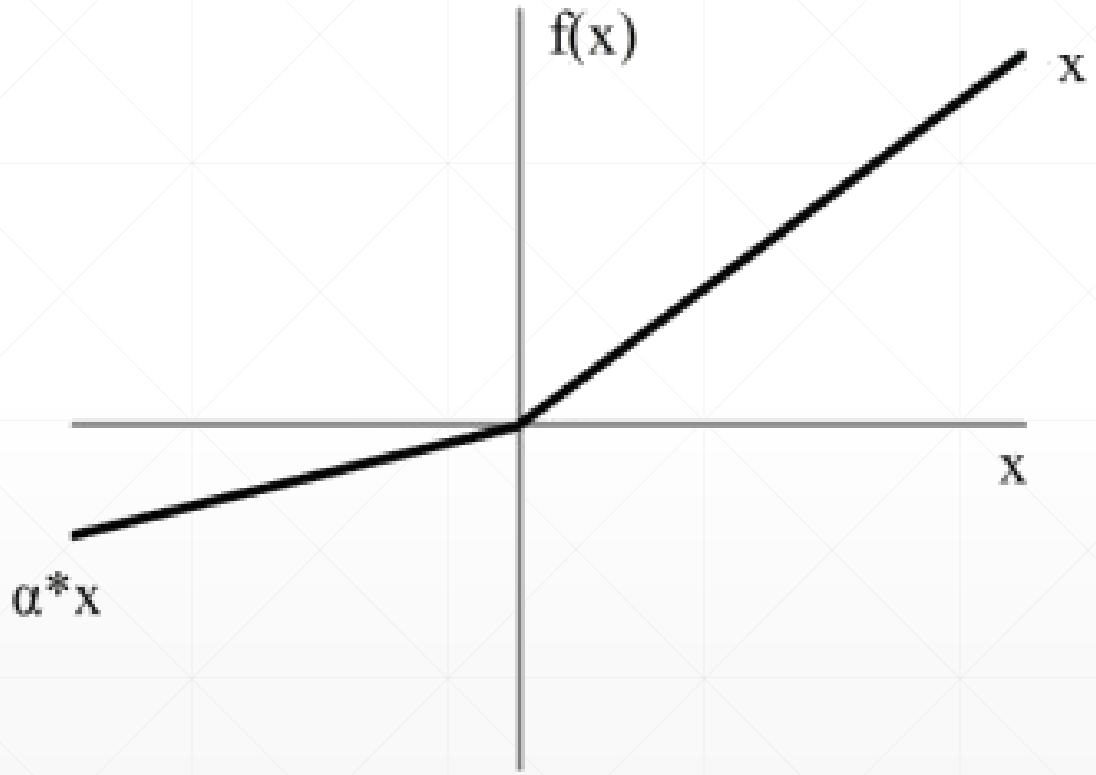
激活函数与GPU加速

主讲人：龙良曲


1.0
0.5
0.0
-0.5
-1.0
f(z)
z
Tanh
Sigmoid


ReLU
R(z) = max(0, z)
1.0
0.5
0.0
f(z)
0.0
z

Leaky ReLU



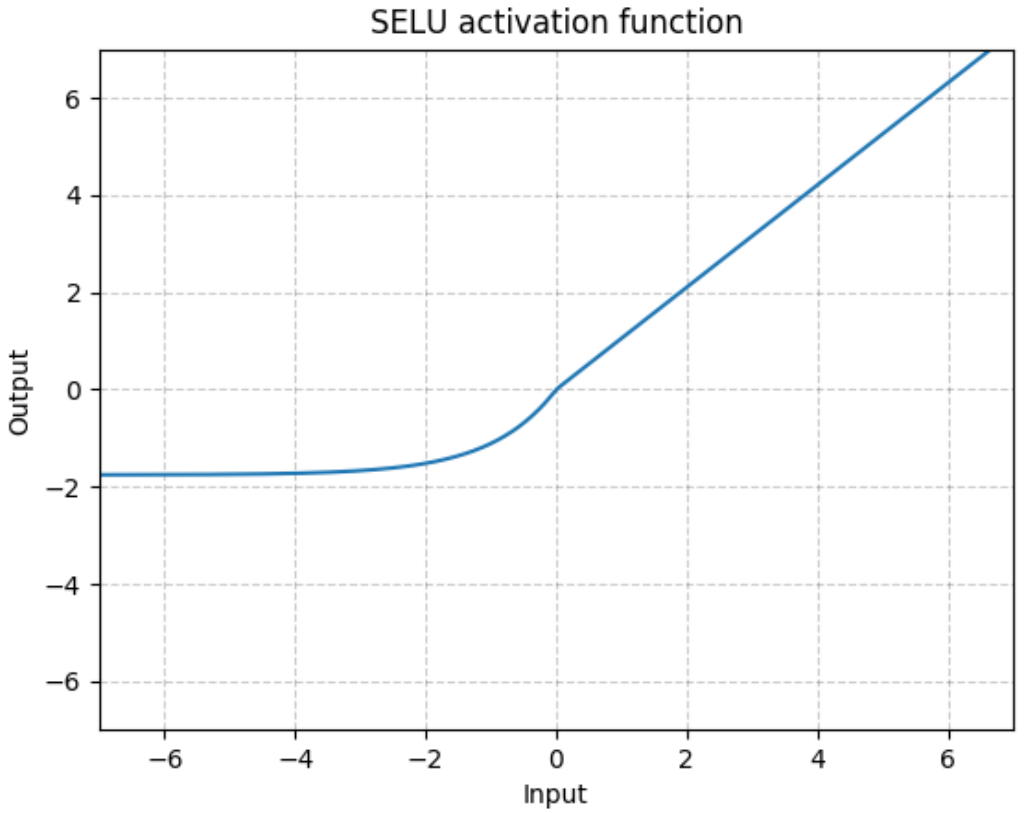
simply

```
self.model = nn.Sequential(
    nn.Linear(784, 200),
    nn.LeakyReLU(inplace=True),
    nn.Linear(200, 200),
    nn.LeakyReLU(inplace=True),
    nn.Linear(200, 10),
    nn.LeakyReLU(inplace=True),
)
```

SELU

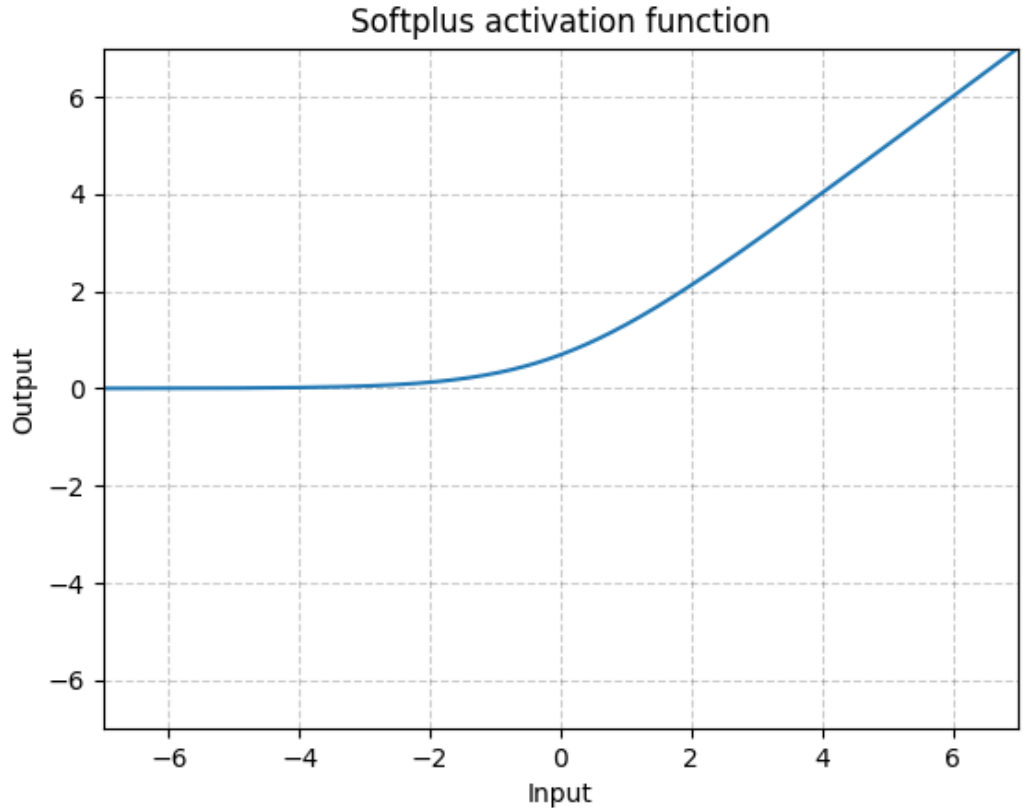
$$\mathrm{SELU}(x) = \mathrm{scale} * (\max(0, x) + \min(0, \alpha * (\exp(x) - 1)))$$

with $\alpha = 1.6732632423543772848170429916717$ and
$\mathrm{scale} = 1.0507009873554804934193349852946.$



softplus

$$\text{Softplus}(x) = \frac{1}{\beta} * \log(1 + \exp(\beta * x))$$

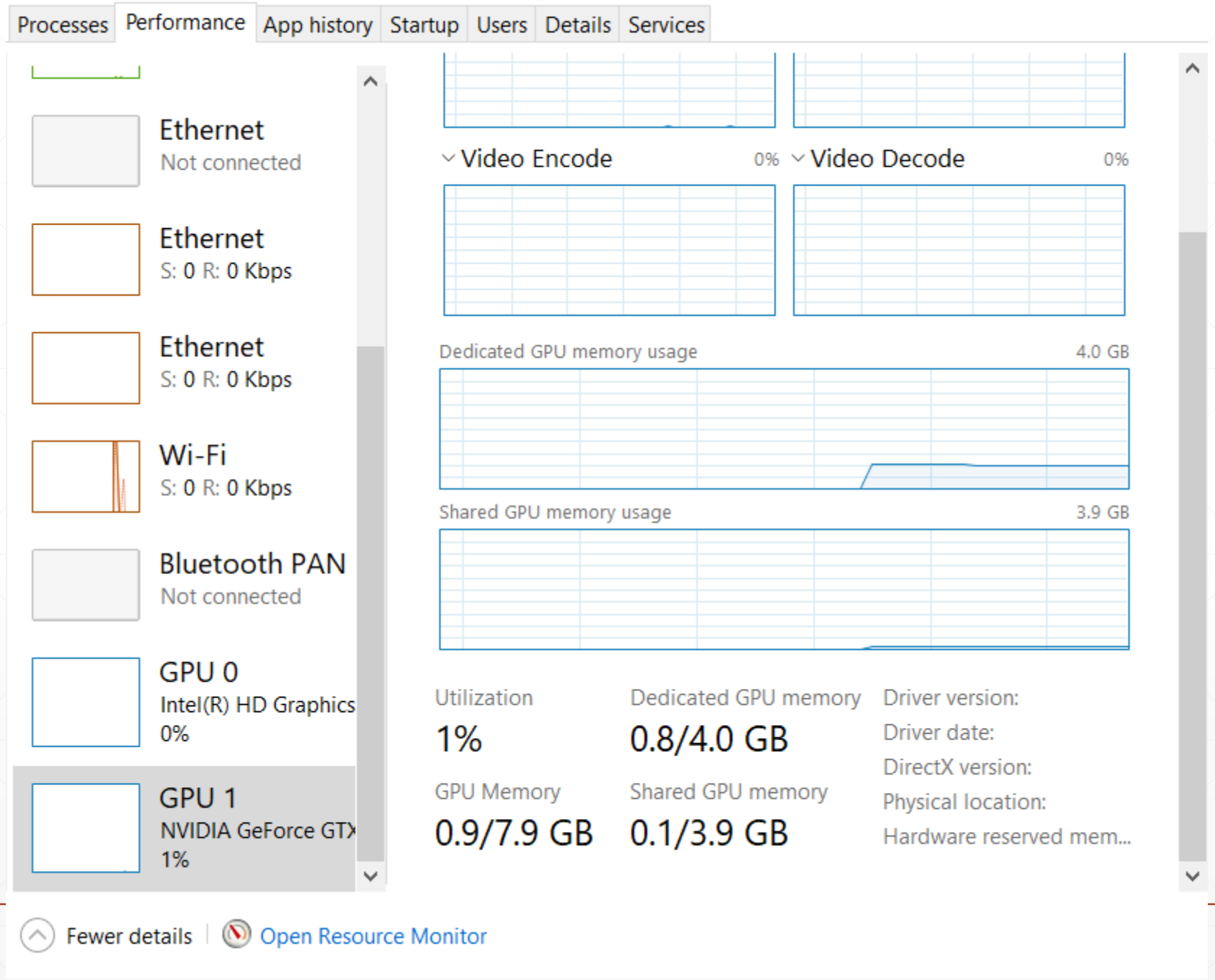


GPU accelerated

```
device = torch.device('cuda:0')
net = MLP().to(device)
optimizer = optim.SGD(net.parameters(), lr=learning_rate)
criteon = nn.CrossEntropyLoss().to(device)

for epoch in range(epochs):

    for batch_idx, (data, target) in enumerate(train_loader):
        data = data.view(-1, 28*28)
        data, target = data.to(device), target.cuda()
```


Processes
Performance
App history
Startup
Users
Details
Services
Ethernet
Not connected
Ethernet
S: 0 R: 0 Kbps
Ethernet
S: 0 R: 0 Kbps
Wi-Fi
S: 0 R: 0 Kbps
Bluetooth PAN
Not connected
GPU 0
Intel(R) HD Graphics
0%
GPU 1
NVIDIA GeForce GTX
1%
Video Encode
0%
Video Decode
0%
Dedicated GPU memory usage
4.0 GB
Shared GPU memory usage
3.9 GB
Utilization
1%
Dedicated GPU memory
0.8/4.0 GB
Driver version:
Driver date:
DirectX version:
Physical location:
Hardware reserved mem...
GPU Memory
0.9/7.9 GB
Shared GPU memory
0.1/3.9 GB
Fewer details
Open Resource Monitor

下一课时

测试

Thank You.