07

January 23, 2024

[1]:
```
import torch
```

[2]:
```
class ConvNet(torch.nn.Module):
    class Block(torch.nn.Module):
        def __init__(self, n_input, n_output, stride=1):
            super().__init__()
            self.net = torch.nn.Sequential(
              torch.nn.Conv2d(n_input, n_output, kernel_size=3, padding=1,␣
 ↪stride=stride),
              torch.nn.ReLU(),
              torch.nn.Conv2d(n_output, n_output, kernel_size=3, padding=1),
              torch.nn.ReLU()
            )
            torch.nn.init.xavier_normal_(self.net[0].weight)
            torch.nn.init.constant_(self.net[0].bias, 0.1)

        def forward(self, x):
            return self.net(x)

    def __init__(self, layers=[32,64,128], n_input_channels=3):
        super().__init__()
        L = [torch.nn.Conv2d(n_input_channels, 32, kernel_size=7, padding=3,␣
 ↪stride=2),
             torch.nn.ReLU(),
             torch.nn.MaxPool2d(kernel_size=3, stride=2, padding=1)]
        c = 32
        for l in layers:
            L.append(self.Block(c, l, stride=2))
            c = l
        self.network = torch.nn.Sequential(*L)
        self.classifier = torch.nn.Linear(c, 1)

        # Initialize the weights
        torch.nn.init.zeros_(self.classifier.weight)
        torch.nn.init.xavier_normal_(self.network[0].weight)
        torch.nn.init.constant_(self.network[0].bias, 0.1)
```

```
    def forward(self, x):
        # Compute the features
        z = self.network(x)
        # Global average pooling
        z = z.mean(dim=[2,3])
        # Classify
        return self.classifier(z)[:,0]
```

[3]:
```
net = ConvNet()
print(net.network[0].weight, net.network[0].bias)
print()
print(net.classifier.weight, net.classifier.bias)
```

```
Parameter containing:
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containing:
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```

[ ]: