THE GEORGE
WASHINGTON
UNIVERSITY

WASHINGTON, DC

CIFAR 100
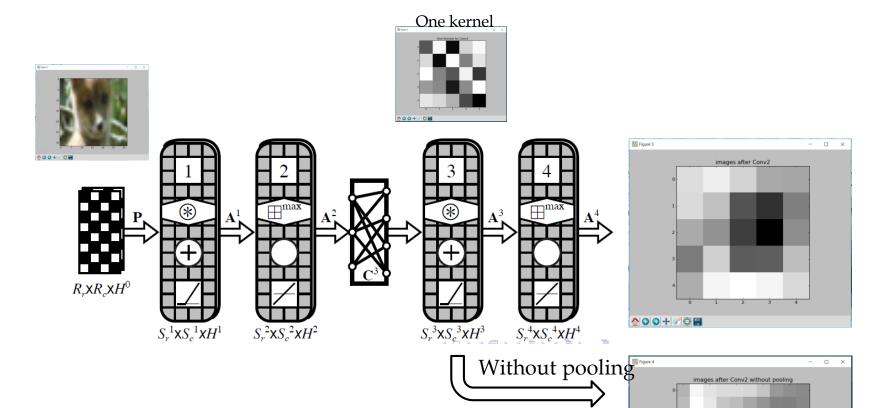
Training CNN with PyTorch on CIFAR100 dataset

CNN in Pytorch
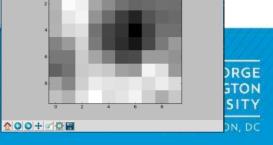
		CV_2	CV_5	CV_6
	batch size	200	200	200
	epoch	20	20	20
Conv1	nn.Conv2d(in_channels=3, out_channels=30, kernel_size=5)	v		v
	nn.Conv2d(in_channels=3, out_channels=30, kernel_size=5,stride=3)		v	
pool1	nn.MaxPool2d(kernel_size=2, stride=2)	v	v	v
Conv2	nn.Conv2d(in_channels=30, out_channels=80, kernel_size=5)	v		v
	nn.Conv2d(in_channels=30, out_channels=80, kernel_size=5,stride=1)		v	
pool2	nn.MaxPool2d(kernel_size=2, stride=2)	v		
ip	nn.Linear(**, 120)	v	v	v
	nn.Linear(**, 100)	v	v	v
	Accuracy	22%	12%	28%
	training time(s)	242	186	246

1. Changing the number of stride at convolution layer decreases with accuracy because FM did not sufficiently extract the feature of the picture.
   - The size of outputs of Conv2 down to 80x1x1
   - Suggest to increase the size of outputs of Conv2 layer by removing pool2 layer
2. Model CV_6 without pool2 layer has a better performance at accuracy

CNN in Pytorch

One kernel

R_rxR_cxH^0

S_r^1xS_c^1xH^1 S_r^2xS_c^2xH^2 S_r^3xS_c^3xH^3 S_r^4xS_c^4xH^4

P   **A^1**   **A^2**   **C^3**   **A^3**   **A^4**

images after Conv2

Without pooling

images after Conv2 without pooling

- Output after convolution2 without pooling has more information extracted from the original picture

CIFAR100 Dataset

The CIFAR-100 dataset consists of 60000 32x32 colour images in 100 classes, with 600 images per class. There are 500 training images and 100 test images.