WEEK 1 UPDATE

CODY HILL • 5/28/26

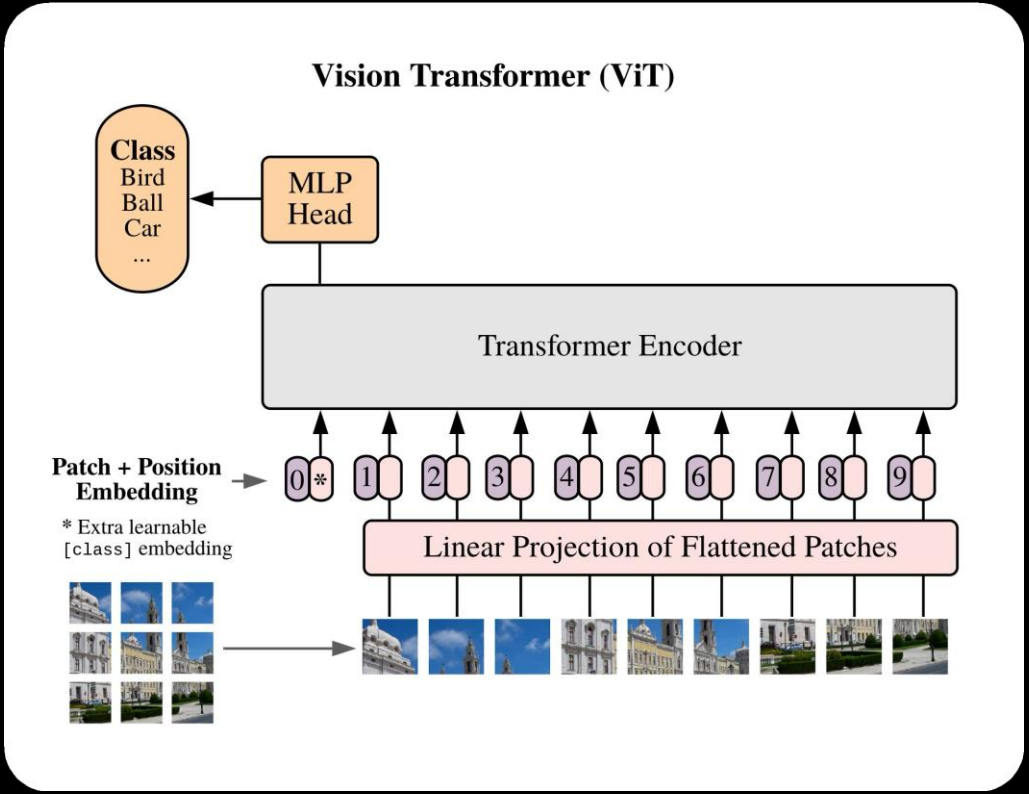
Introduction

- Mississippi State University
- Computer Science, Math, and Spanish
- Robot Swarms; Dr. Jones
- Robotics and Autonomy



(Holland, 2024)

Assignment #1



(Dosovitskiy et al., 2020)

Task

Using 10 hand-picked images, check their classification accuracy using a pre-trained vision transformer.

Assignment #1: My Images



brownies



moose



puppy_golden_retriever



rivian_car



yosemite



airplane



indoor_gym



bicycle



black_cat

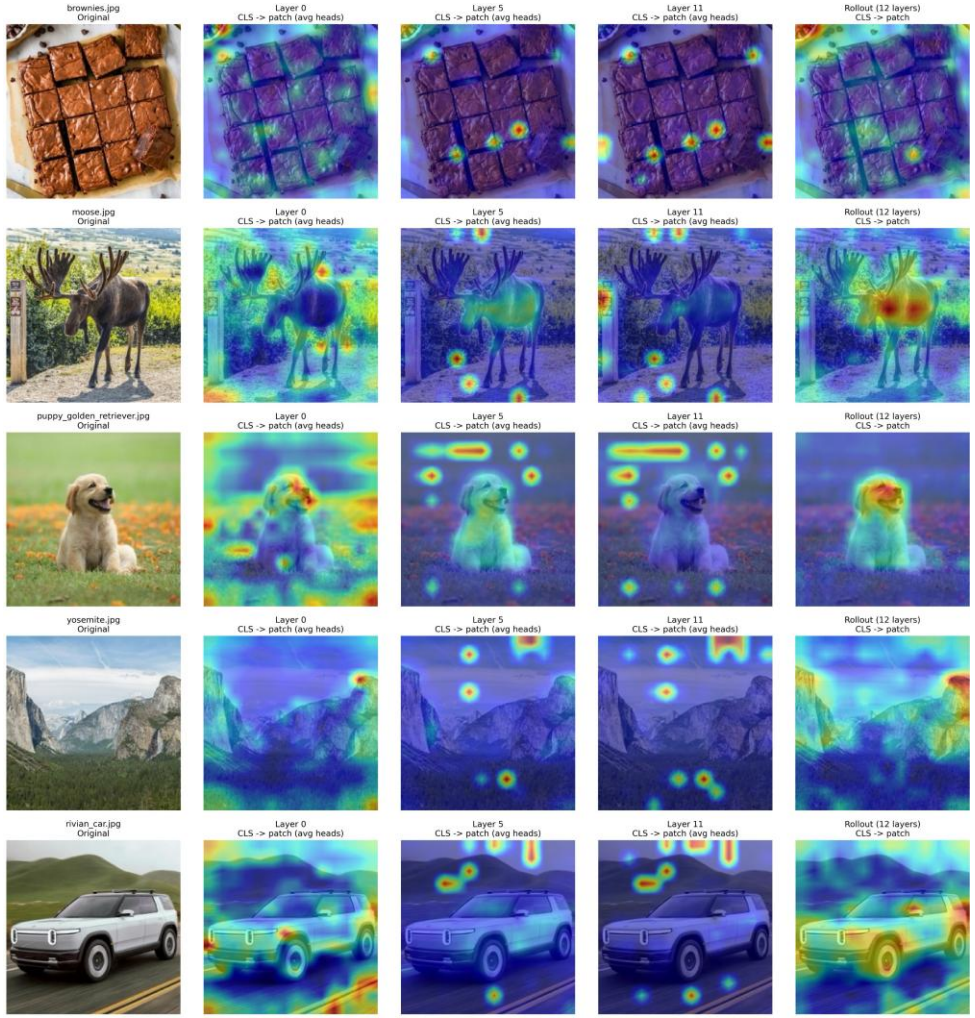


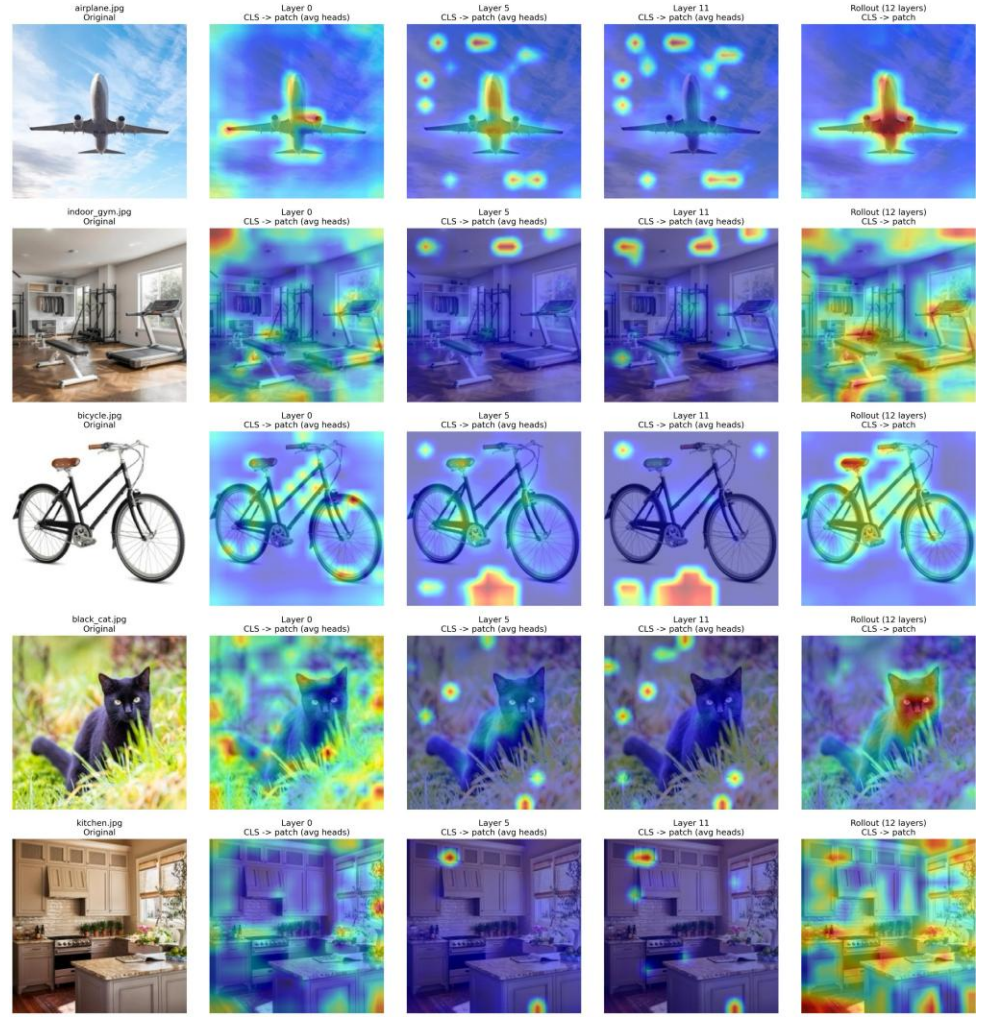
kitchen

Assignment #1: My CSV

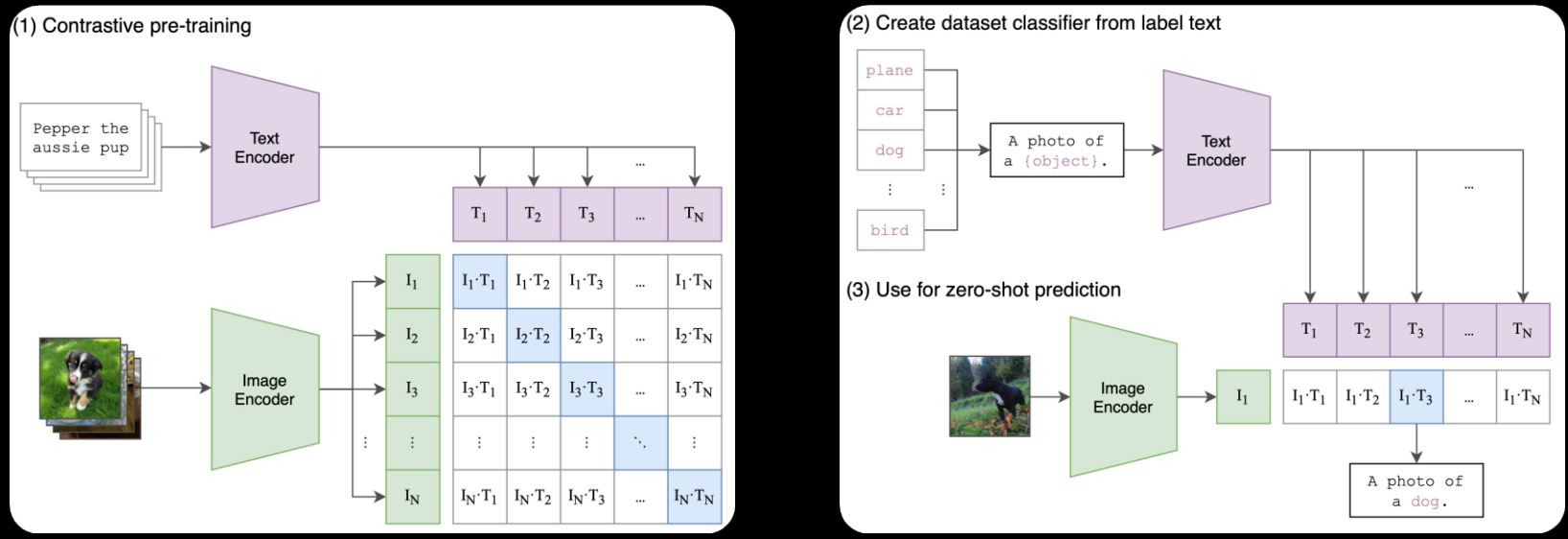
Image Classification Results				
#	**File**	**Top-1 Conf.**	**Top-2 Conf.**	**Top-3 Conf.**
1	brownies.jpg	chocolate sauce, chocolate syrup (39.29)%	plate (6.38)%	bakery, bakeshop, bakehouse (3.44)%
2	moose.jpg	ibex, Capra ibex (14.25)%	gazelle (9.05)%	bighorn, bighorn sheep, cimarron, Rocky Mountain bighorn, Rocky Mountain sheep, Ovis canadensis (7.49)%
3	puppy_golden_retriever.jpg	golden retriever (88.88)%	Labrador retriever (8.97)%	Sussex spaniel (0.31)%
4	rivian_car.jpg	jeep, landrover (78.97)%	beach wagon, station wagon, wagon, estate car, beach waggon, station waggon, waggon (7.78)%	pickup, pickup truck (6.27)%
5	yosemite.jpg	alp (44.26)%	valley, vale (27.82)%	cliff, drop, drop-off (25.70)%
6	airplane.jpg	airliner (97.60)%	wing (1.31)%	warplane, military plane (0.55)%
7	indoor_gym.jpg	dumbbell (50.14)%	barbell (33.37)%	parallel bars, bars (1.56)%
8	bicycle.jpg	bicycle-built-for-two, tandem bicycle, tandem (84.92)%	mountain bike, all-terrain bike, off-roader (10.66)%	tricycle, trike, velocipede (0.68)%
9	black_cat.jpg	Egyptian cat (89.71)%	tiger cat (1.48)%	tabby, tabby cat (1.16)%
10	kitchen.jpg	plate rack (55.39)%	microwave, microwave oven (15.79)%	window shade (6.61)%

Assignment #1: My Heatmap





Assignment #2



(Radford et al., 2021)

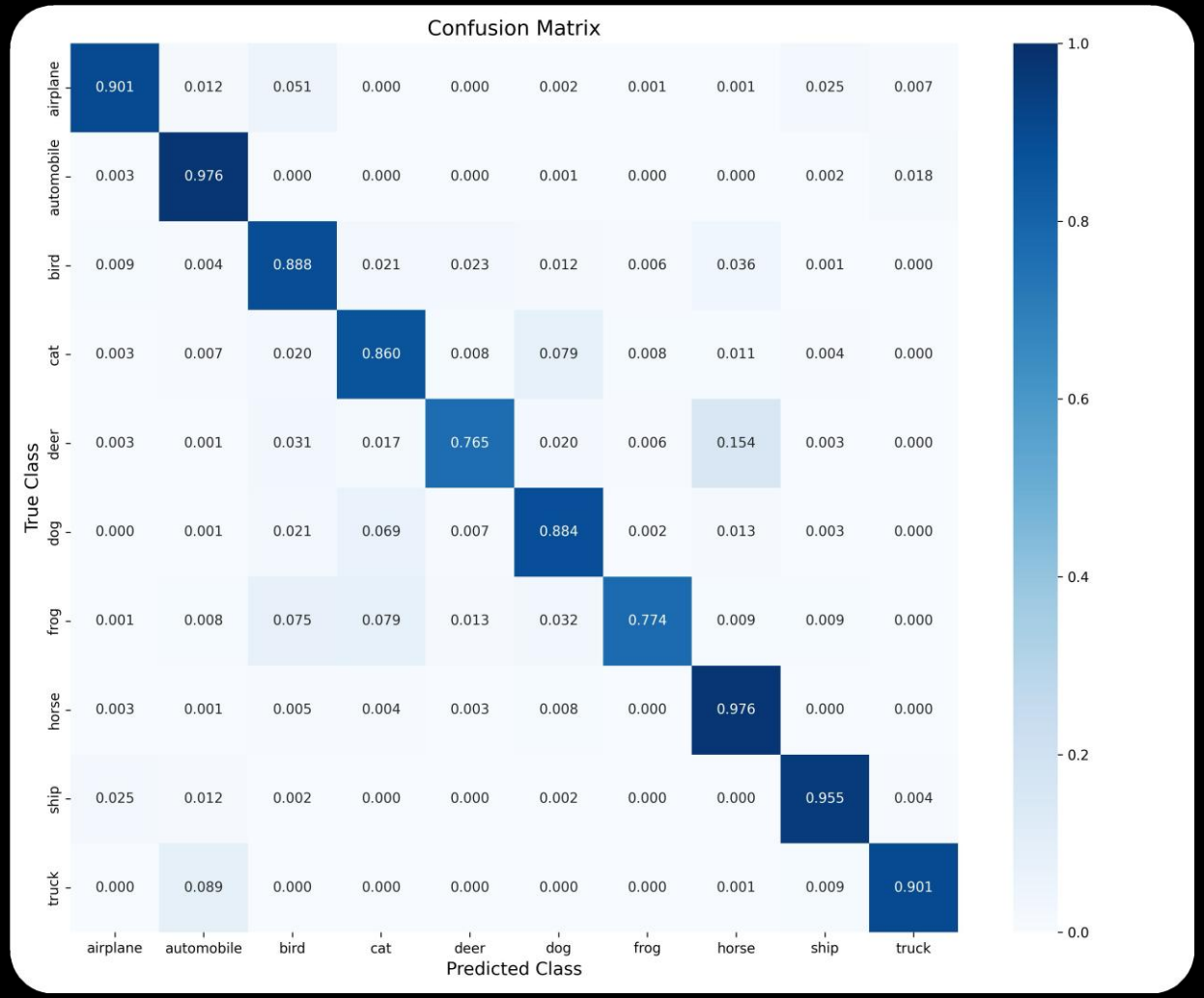
Task

Use CIFAR-10 test data for zero-shot classification with CLIP

Assignment #2: Similarity Scores

CLIP CIFAR-10 Inference Results	
Caption	**Similarity Score**
a photo of a airplane	95.04%
a photo of a automobile	87.85%
a photo of a bird	81.24%
a photo of a cat	81.90%
a photo of a deer	93.41%
a photo of a dog	85.00%
a photo of a frog	97.11%
a photo of a horse	81.27%
a photo of a ship	94.46%
a photo of a truck	96.88%

Assignment #1: Confusion Matrix



Maps classified pairs and their rate of occurrence; only correct pairs along diagonal

Assignment #2: Failed Images

Is a: Frog



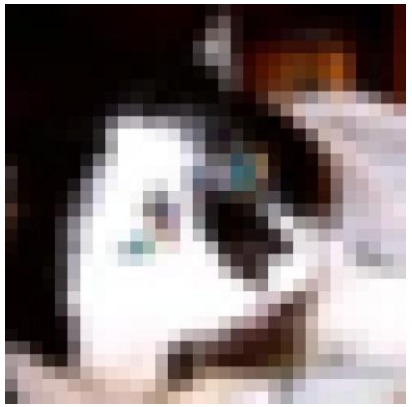
Pred: Dog

Is a: Deer



Pred: Horse

Is a: Cat



Pred: Dog

Is a: Dog



Pred: Cat

Is a: Truck



Pred: Auto.

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