Practical 4: CNN-based object classification
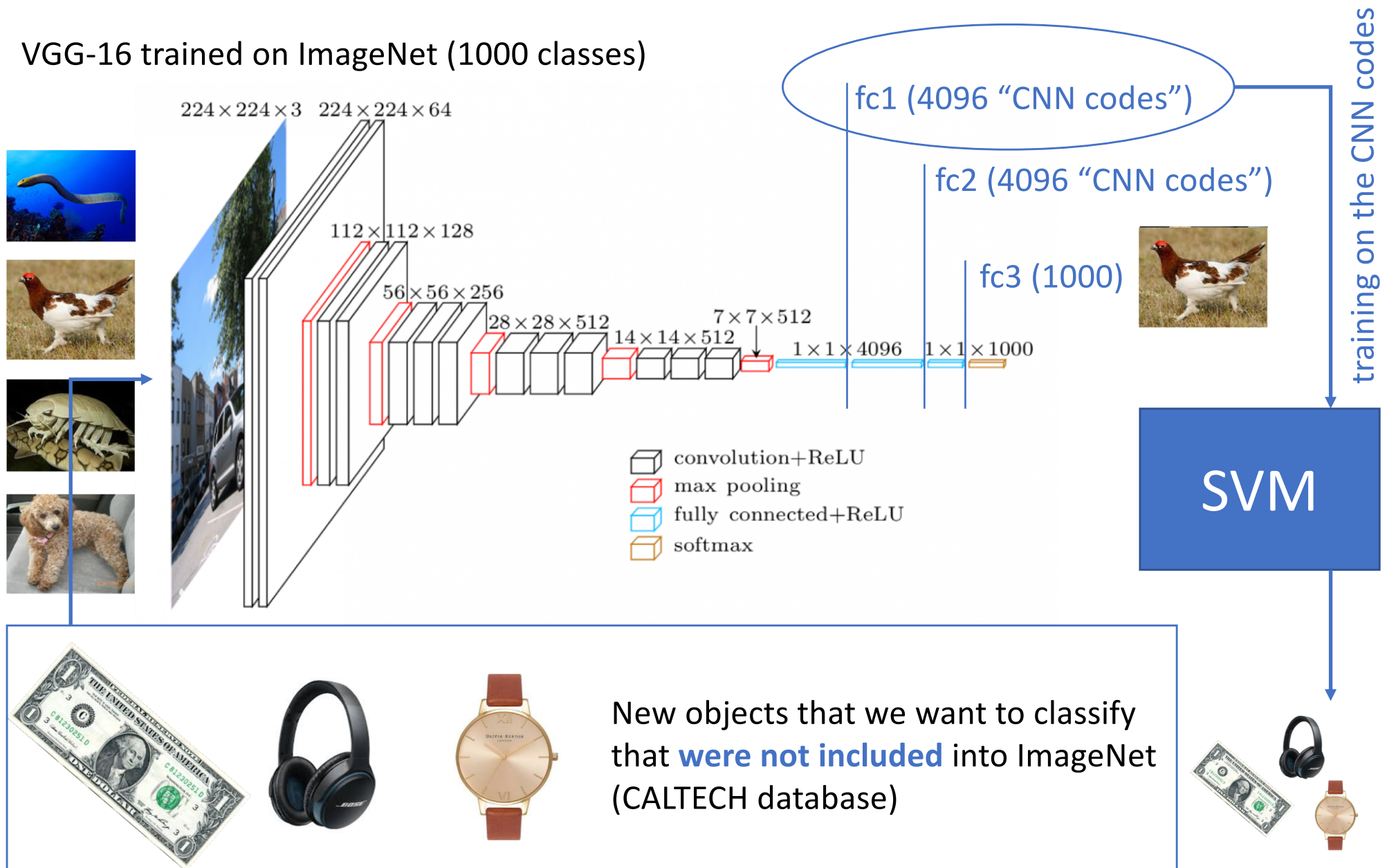## What we are doing today?

VGG-16 trained on ImageNet (1000 classes)

fc1 (4096 "CNN codes")

fc2 (4096 "CNN codes")

fc3 (1000)

training on the CNN codes

SVM

convolution+ReLU
max pooling
fully connected+ReLU
softmax

New objects that we want to classify that **were not included** into ImageNet (CALTECH database)

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Tasks

- ## Task 1 (1 point)
  - Select three classes corresponding to the objects you brought to the class
  - Train **linear SVM** using **fc1** CNN codes and try to recognize all your objects on-line **presenting them to the camera**

- ## Task 2 (2 points)
  - Experiment with the **level of the CNN codes** (fc1 vs fc2) and **SVM kernel** ('linear', 'rbf', 'poly') for these three classes
  - Which configuration is the best? How would you explain why this selected configuration works best?

- ## Task 3 (1 point)
  - For the best configuration found in task 2, train your SVM for the **extended set of CALTECH classes** (10 or more, including your 3 classes selected earlier).
  - Does your solution still perform well? What is the reason for a different performance?

Practical 5: CNN-based object classification
Deliverables

- **No need** to submit your codes to SAKAI

- Discuss your observations with the instructor in class

- If you do not accomplish all tasks in class today, send an e-mail to aczajka@nd.edu by **Tuesday, Nov. 19, 11:59pm** with 2-3 sentences per task that summarize your observations