

# *Domain Generalization*

## **Team : Applied AI**

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# *Domain Generalization:*



The key idea of domain generalization is to combine multiple source domains into a single model.



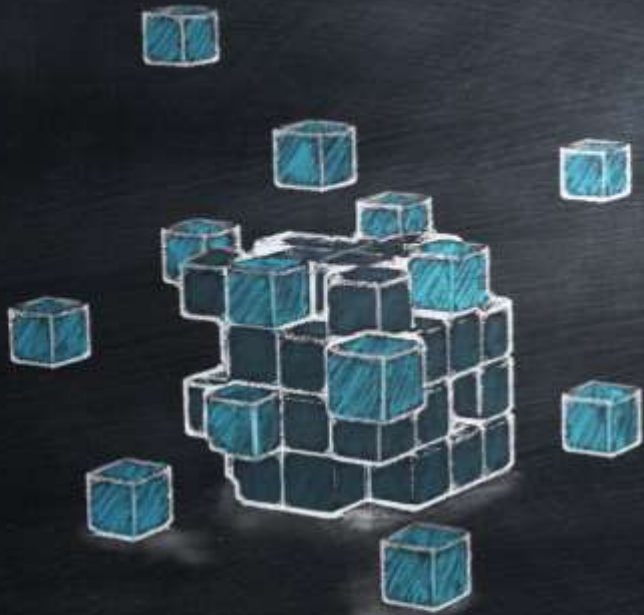
The combined model should be able to work well with the unseen target domain.



Consider A,B,C,D are different domains. If model is trained on A,B and C then, model should perform well on domain D also.



In domain generalization model does not have access to test domain.



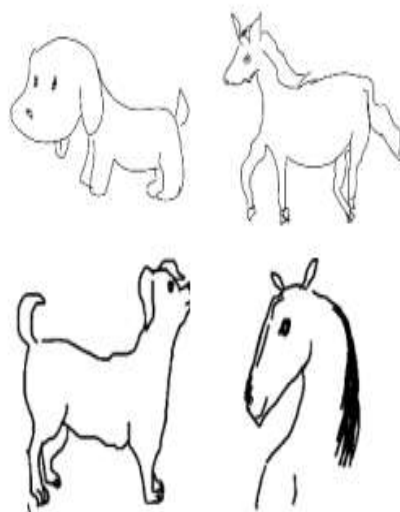
# *Dataset:*

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- Dataset we are using is PACS dataset.
- P- Pictures
- A- Art
- C- Cartoon
- S- sketch
- Here among these are four domains we can pick any three as train domains and other as test domain.
- Example : If PAC is taken as train domains, then S will be the test domain.

# *Sample Images*

Sketch



Cartoon



Art painting



Photo



# *Dataset information*

| classes  | Art<br>painting | cartoon | photo | sketch |
|----------|-----------------|---------|-------|--------|
| Dog      | 379             | 389     | 189   | 772    |
| Elephant | 255             | 457     | 202   | 740    |
| Giraffe  | 285             | 346     | 182   | 753    |
| Guitar   | 184             | 135     | 186   | 608    |
| Horse    | 201             | 324     | 199   | 816    |
| house    | 295             | 288     | 280   | 80     |
| Person   | 449             | 405     | 432   | 160    |



# *Resnet 18*

01

ResNet-18 is a convolutional neural network that is 18 layers deep.

02

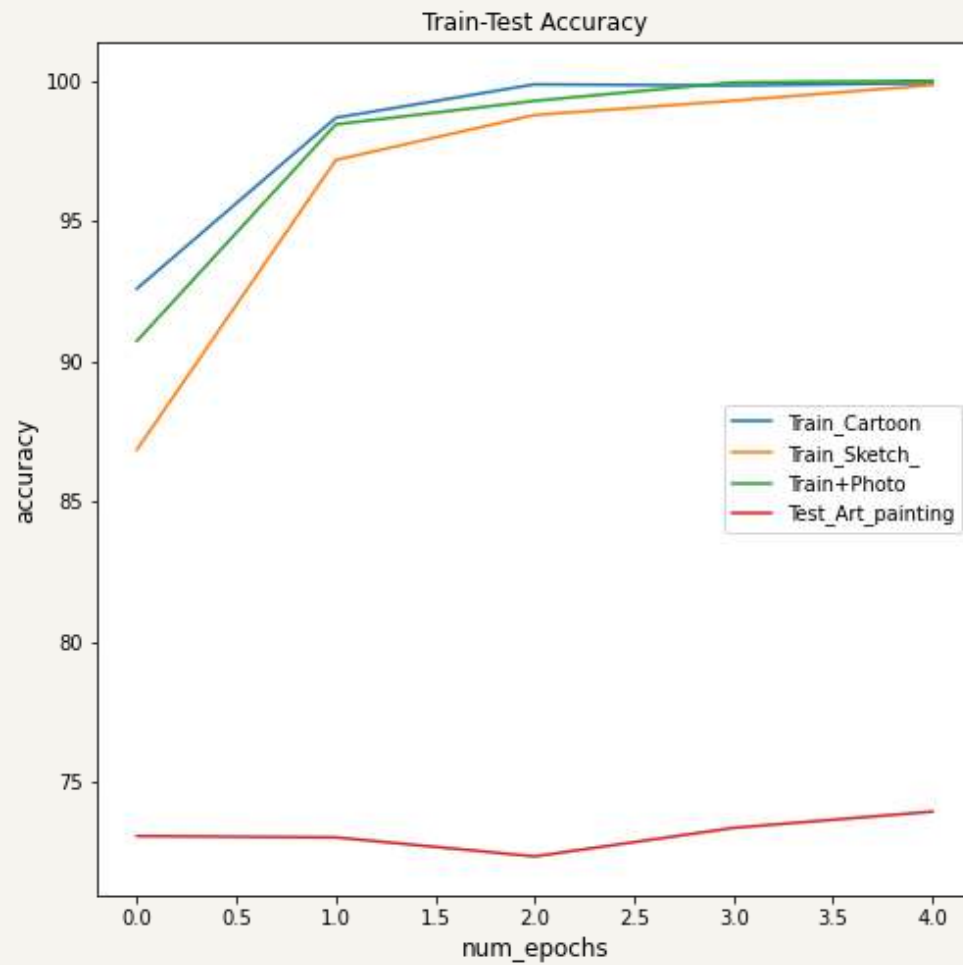
Pretrained version of the network trained on more than one million images from the ImageNet database.

03

The pretrained network can classify images into 1000 object categories.(ex: pen, keyboard, animals)

04

We changed the last fully connected layer to classify images into 7 classes.



*Resnet Results  
(Art paintings  
as test)*


# Meta learning

Learning algorithms that learn from other learning algorithms.(refers to learning about learning.)

**Learning Algorithms:** Learn from historical data and make predictions given new examples of data.





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- *Meta Learning tasks are a category of machine learning problems that include supervised learning, reinforcement learning, and so on. Task Examples :*
  - *A classifier trained on non-cat images can tell whether a given image contains a cat after seeing a handful of cat pictures.*
  - *A game bot is able to quickly master a new game.*
  - *A mini robot completes the desired task on an uphill surface during test even through it was only trained in a flat surface environment.*

# *Meta Learning*



*Thank You*

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