

Intro

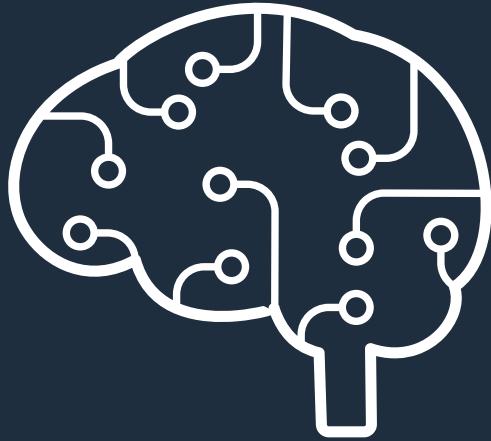
Dimensionality Reduction



Speaker: Waragon Phusuwan

Session: Intro

Module : Dimensionality Reduction



Speaker

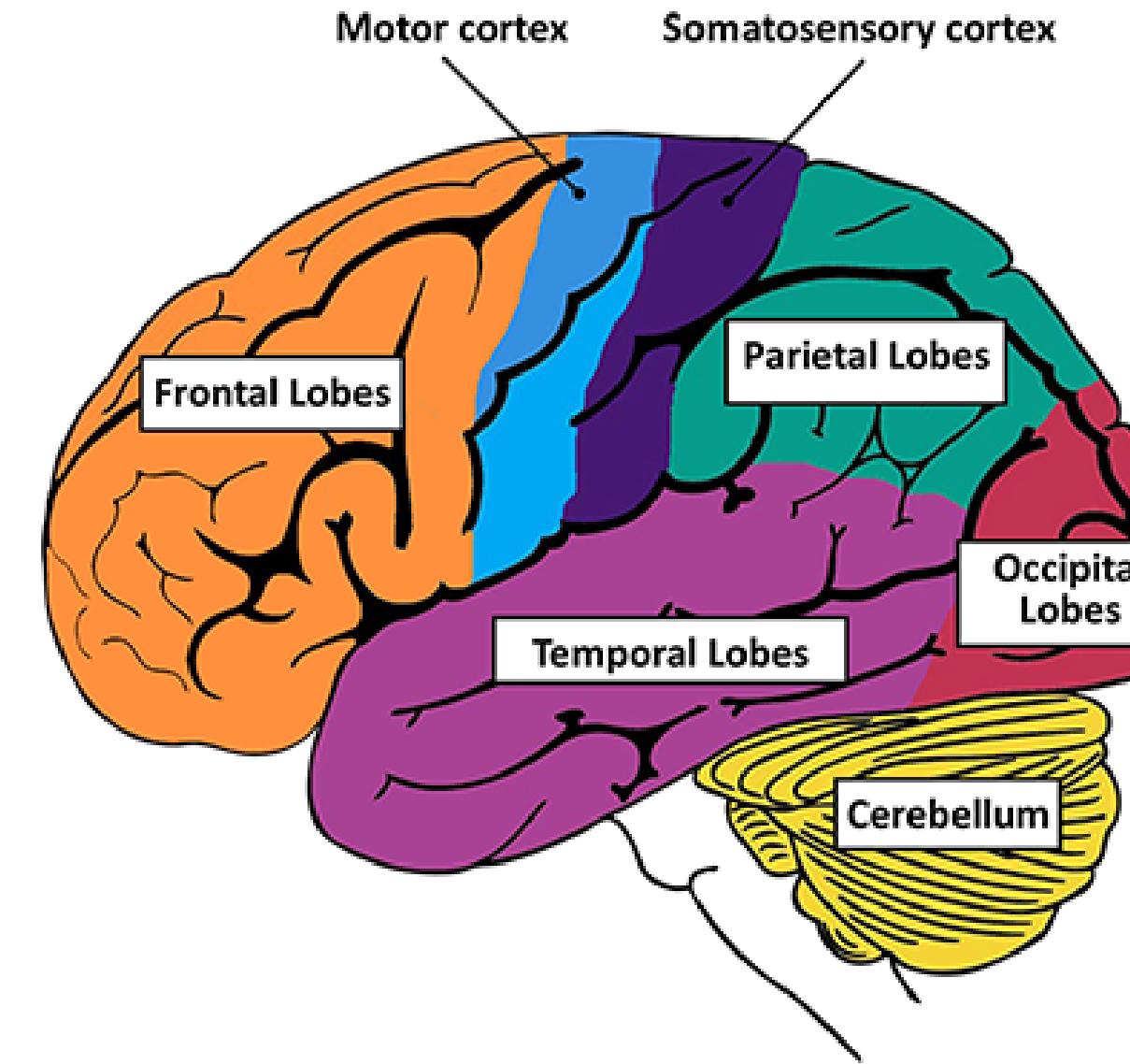
Waragon Phusuwan

B.Sc. Physics
Chulalongkorn University

CCCN
Cognitive Clinical and Computational Neuroscience lab



Brain



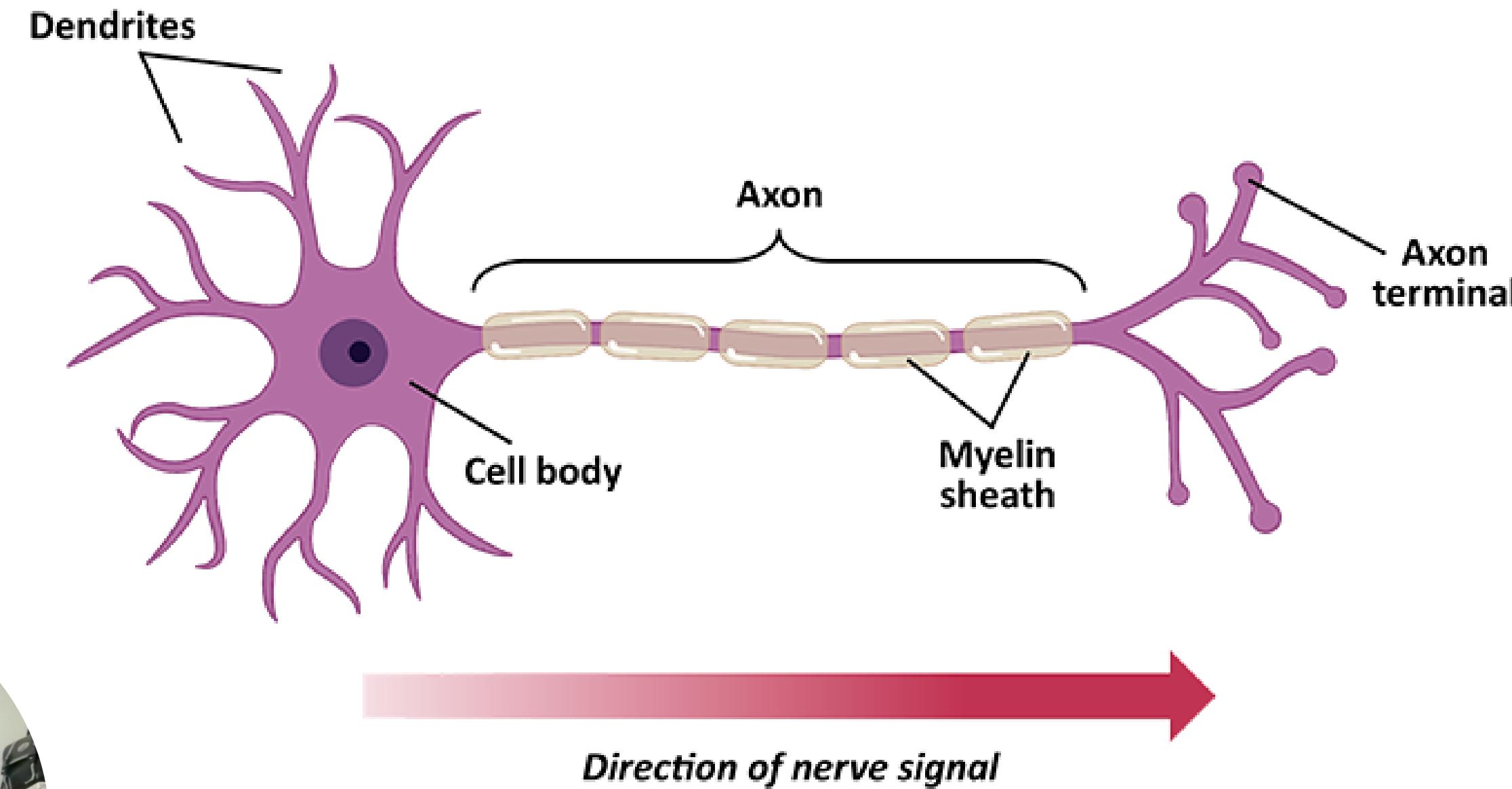
Speaker: Waragon Phusuwan

Session: Intro

Module : Dimensionality Reduction

Picture Source: www.ninds.nih.gov

Neuron



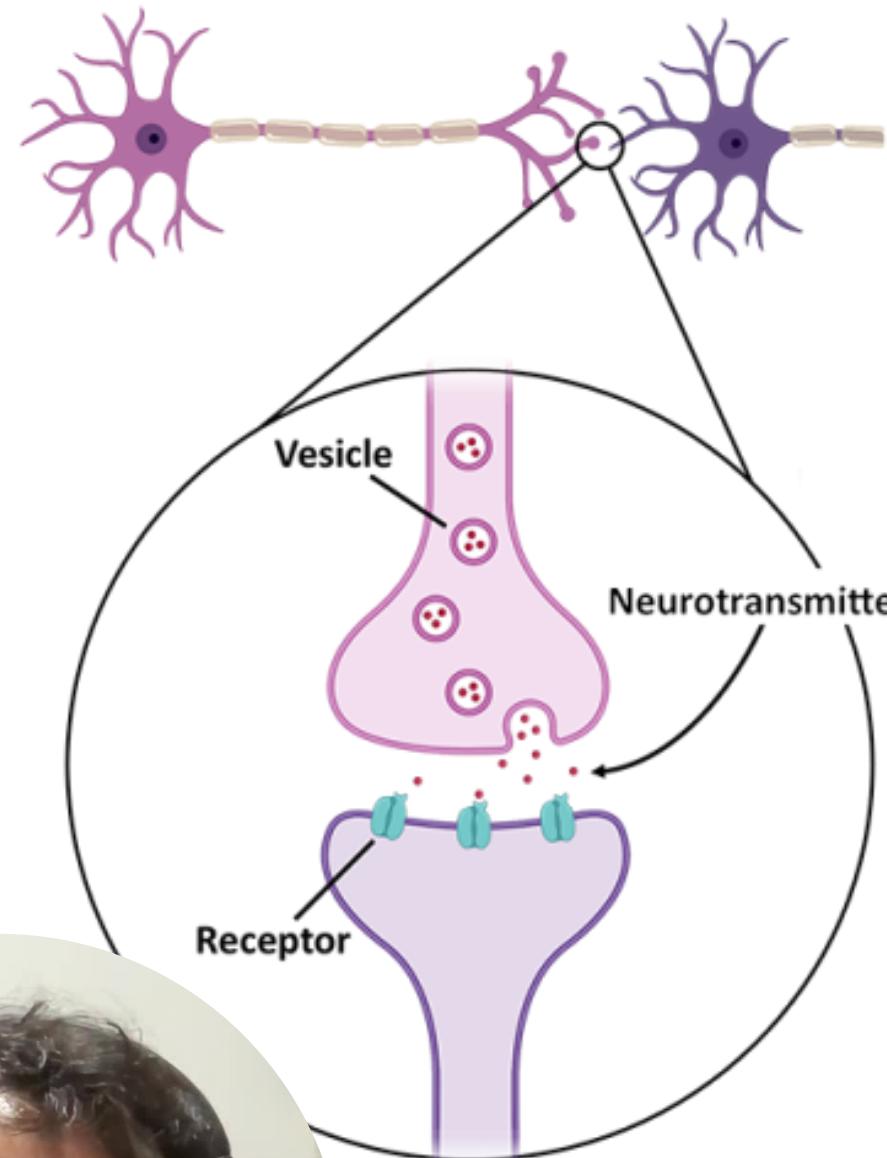
Speaker: Waragon Phusuwan

Session: Intro

Module : Dimensionality Reduction

Picture Source: www.ninds.nih.gov

Constraints: Synapse



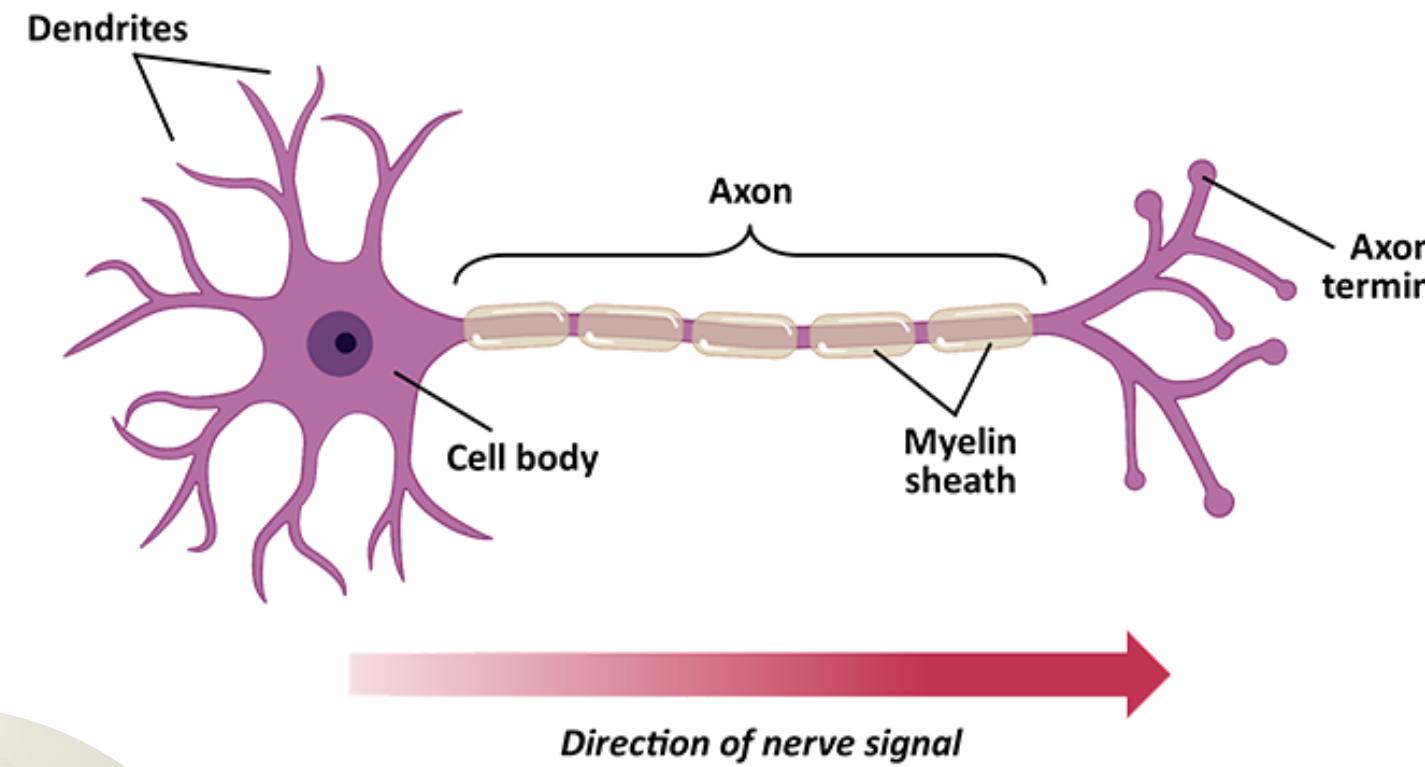
Constraints

- Geometrical constraints
- Physical constraints
- Spatial-Temporal constraints

Picture Source: www.ninds.nih.gov



Constraints: Neurons



Physical constraints

Geometry

Limited Resources

Refractory period



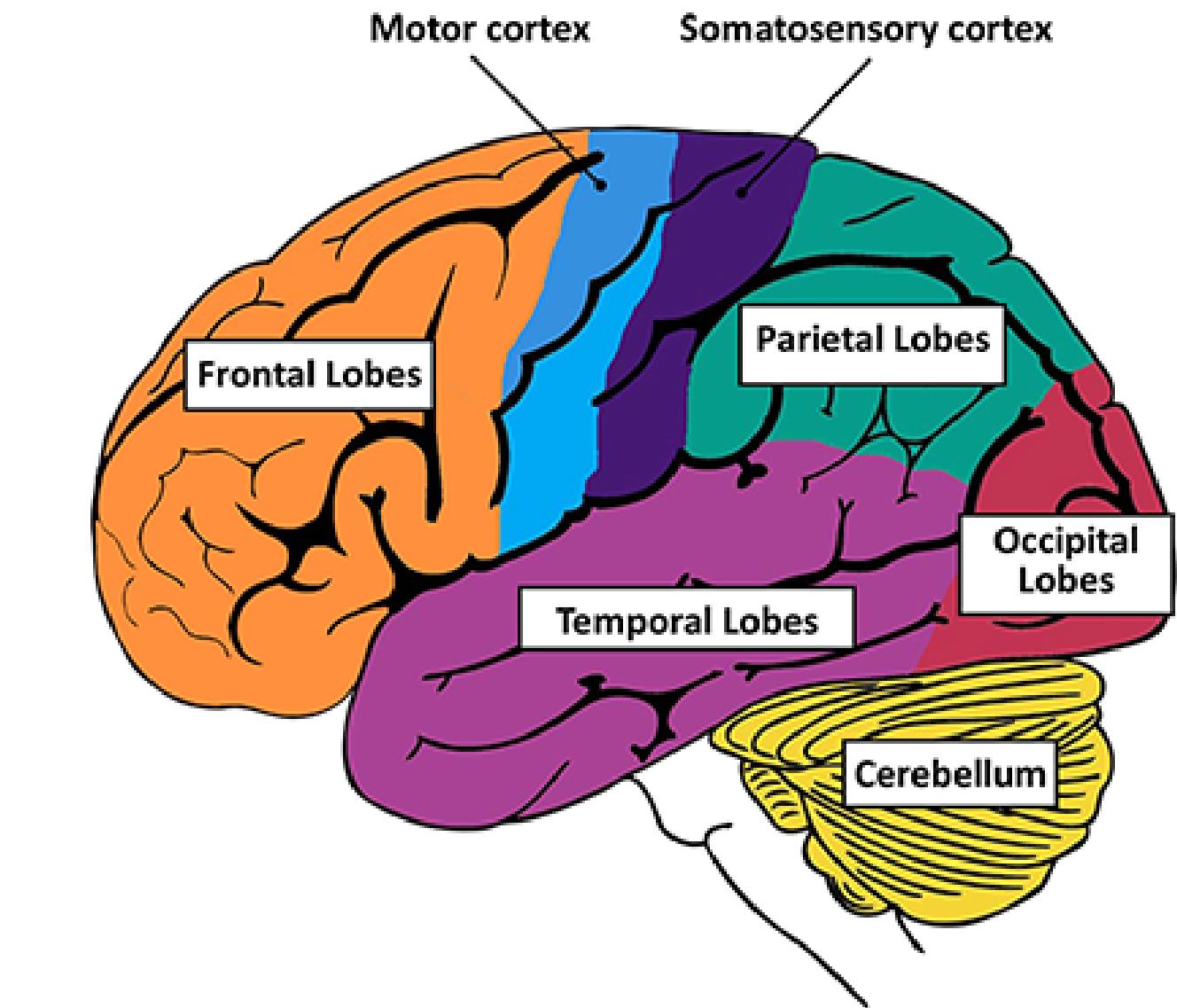
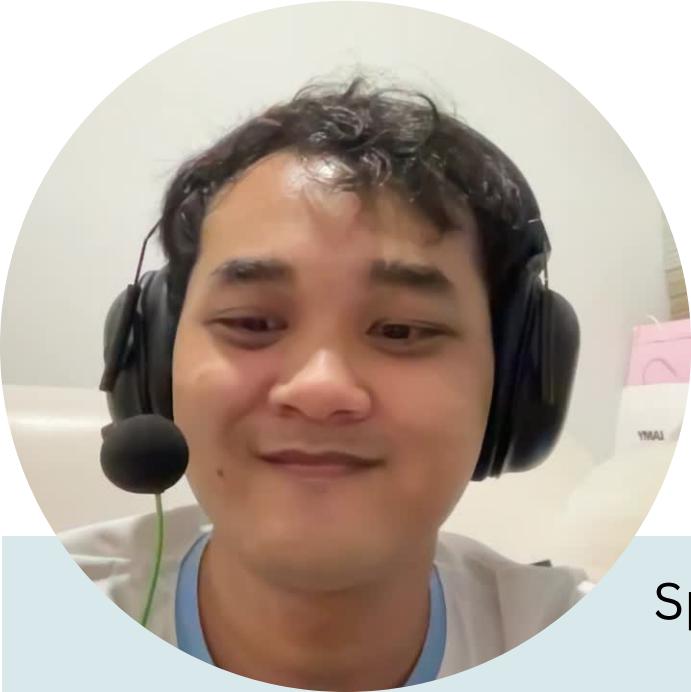
Picture Source: www.ninds.nih.gov

Constraints: Brain

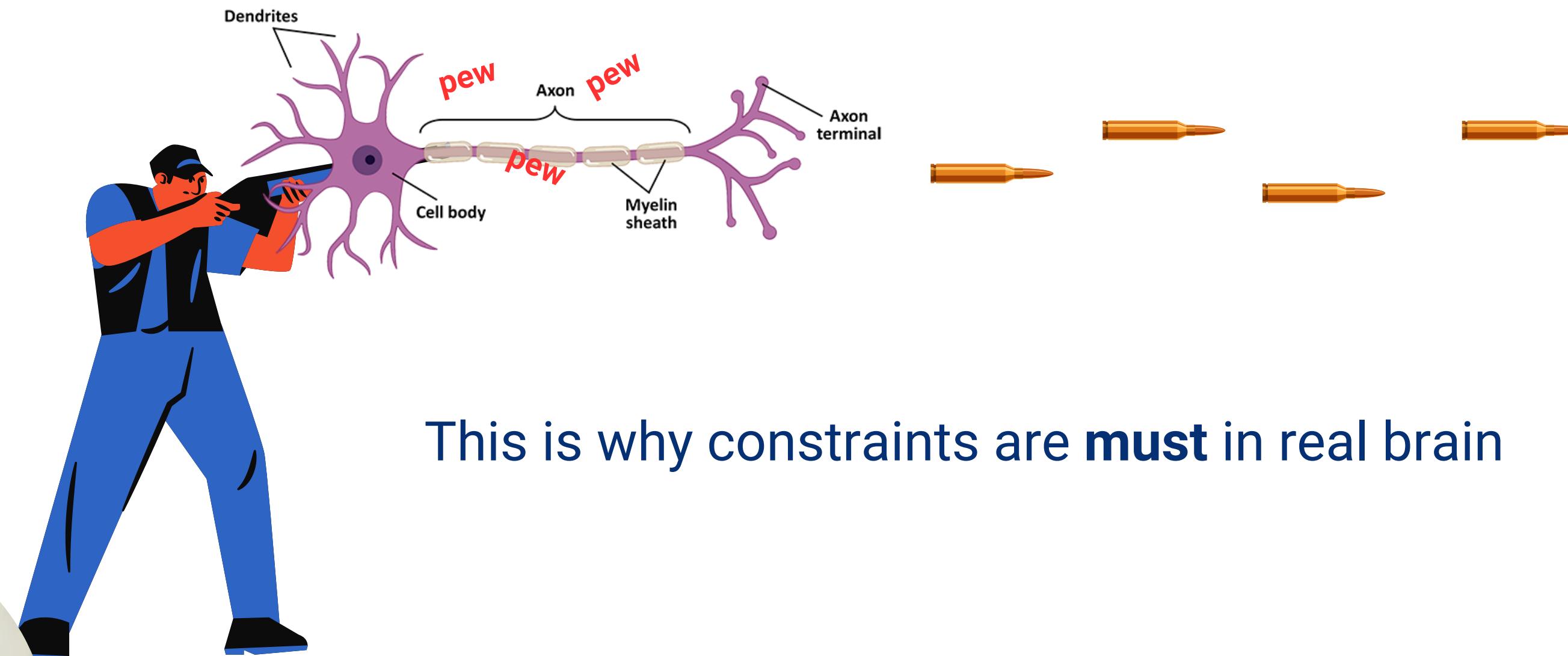
Connectivity

Limited Resources

Spatial Relation



Without constraints



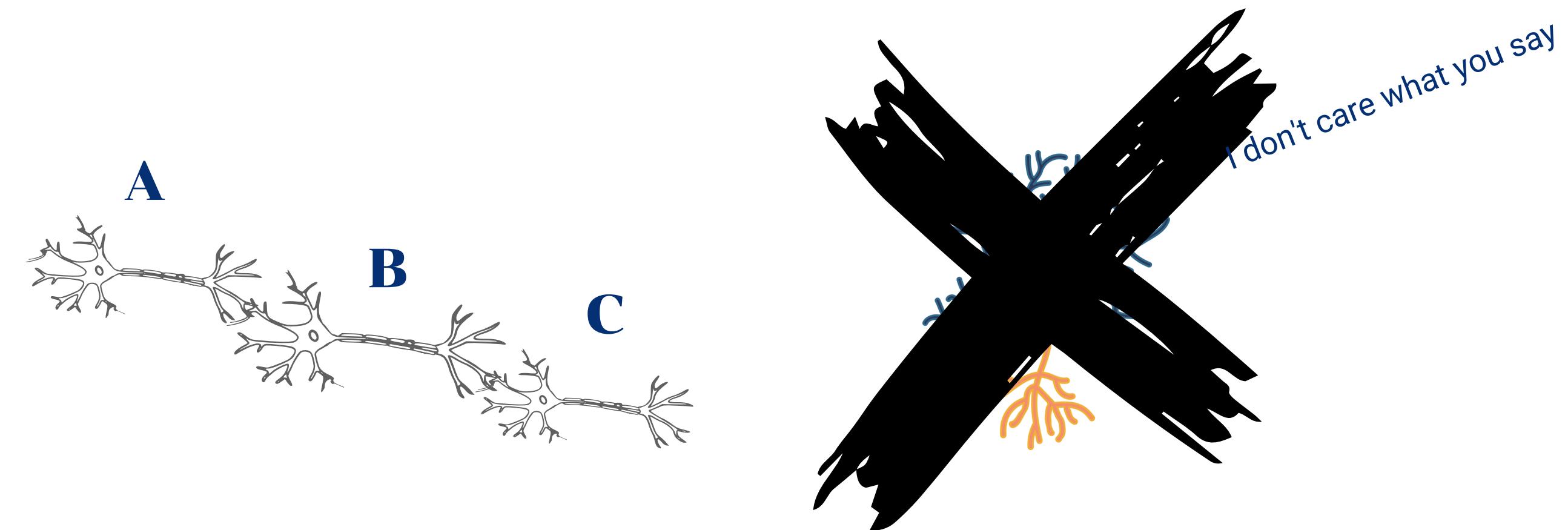
This is why constraints are **must** in real brain



Without constraints



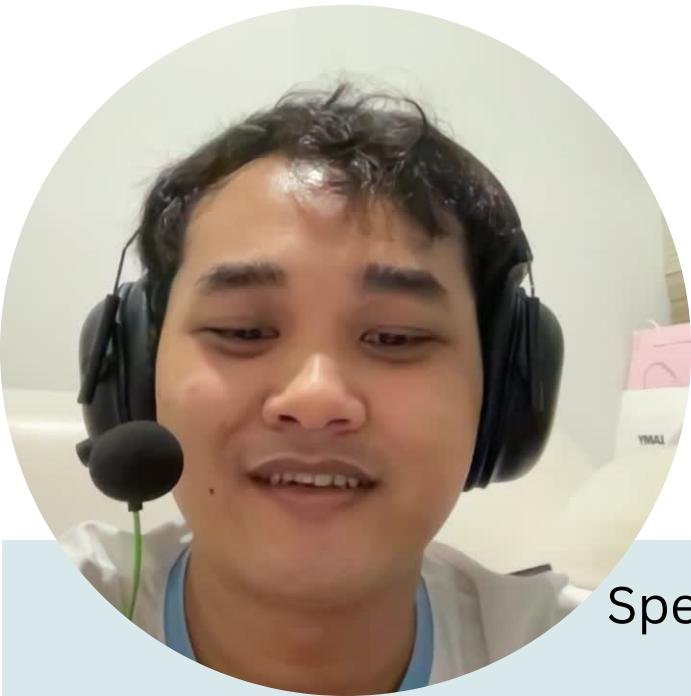
Redundancy

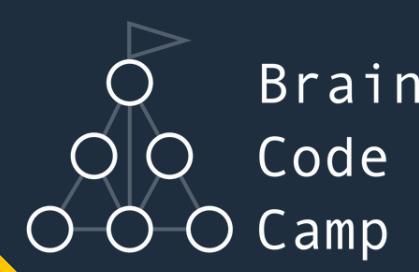


Redundancy



A B C D





Dimensionality Reduction



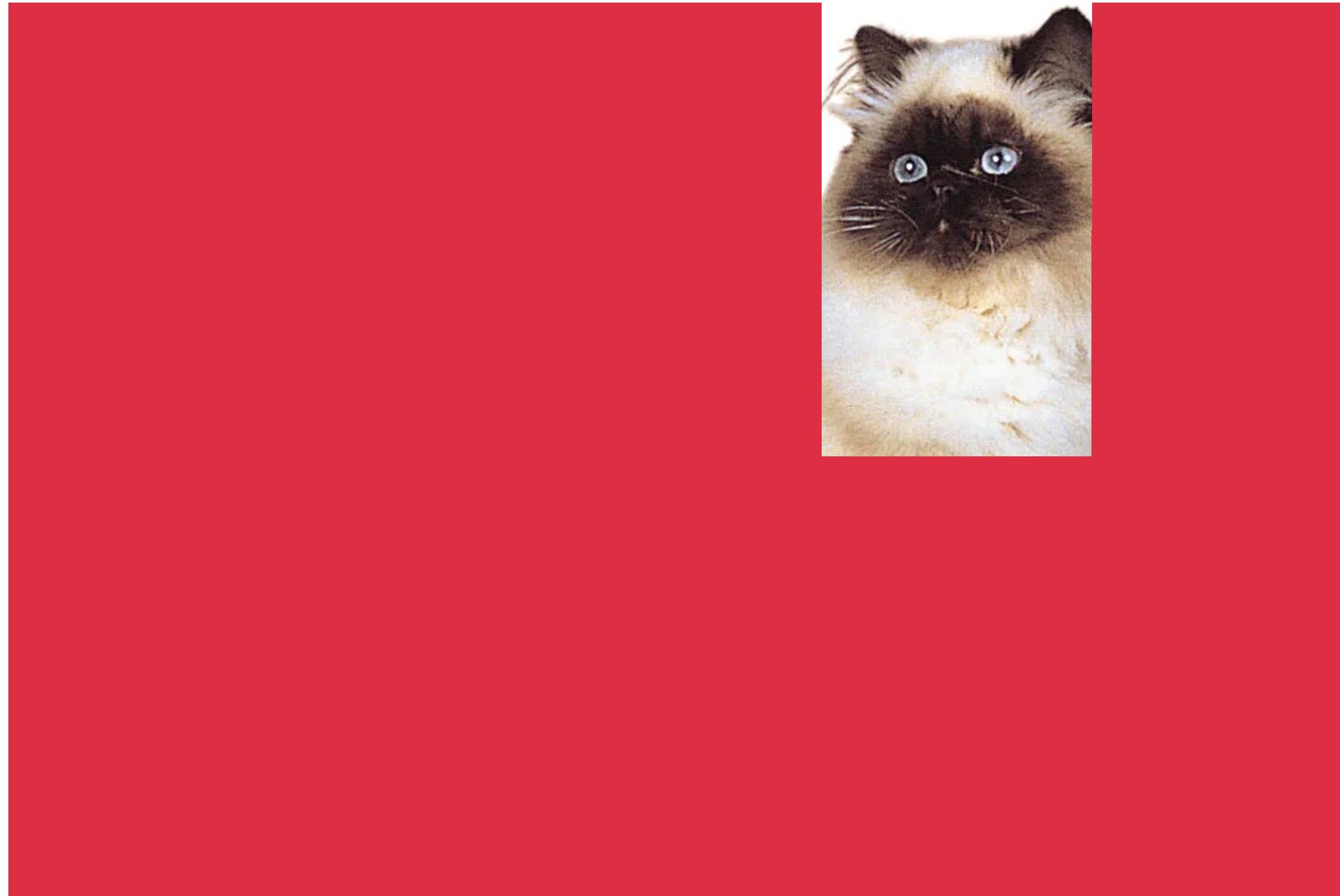
Speaker: Waragon Phusuwan

Session: Intro

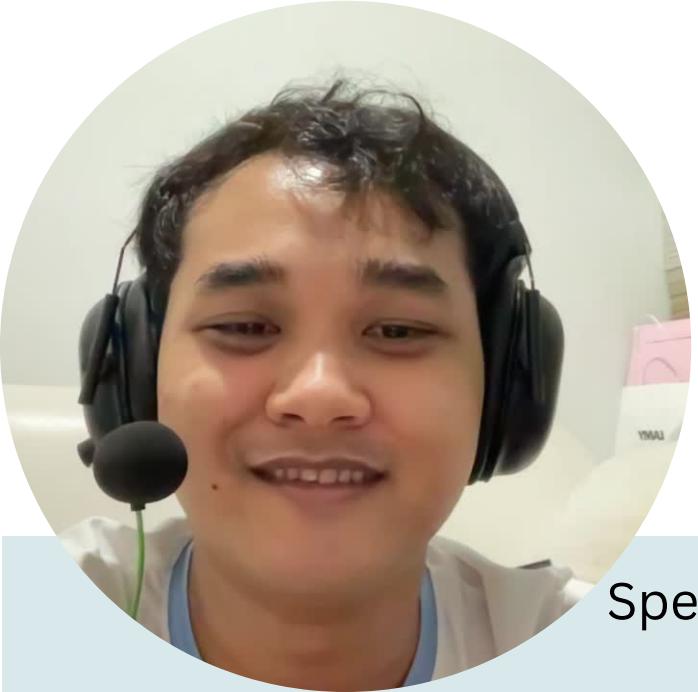
Module : Dimensionality Reduction



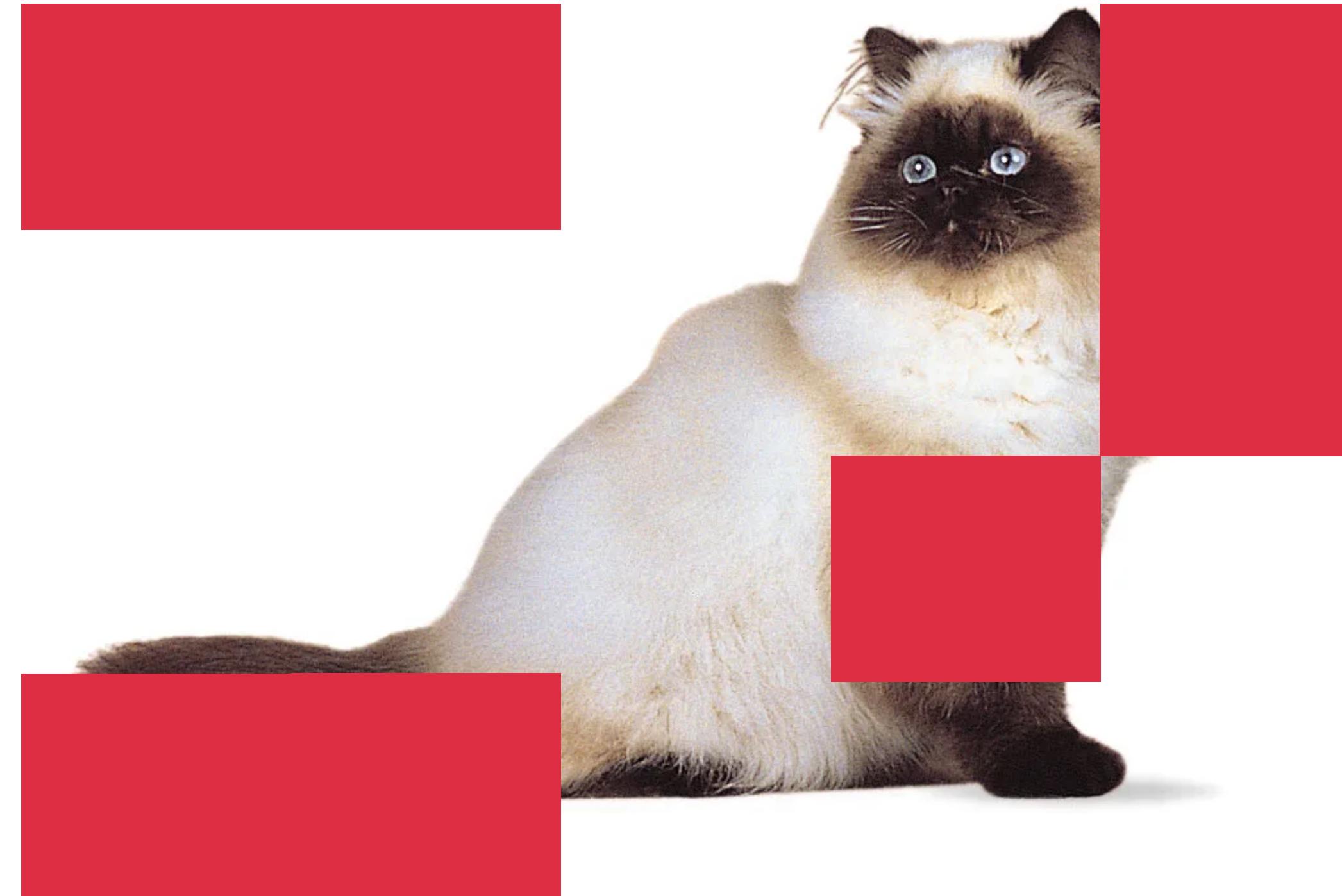
Redundancy in image



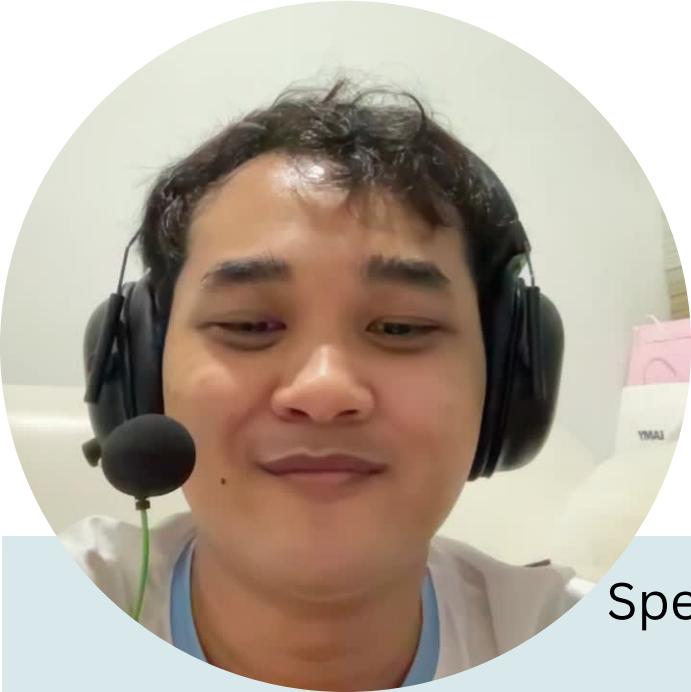
<https://www.britannica.com/animal>



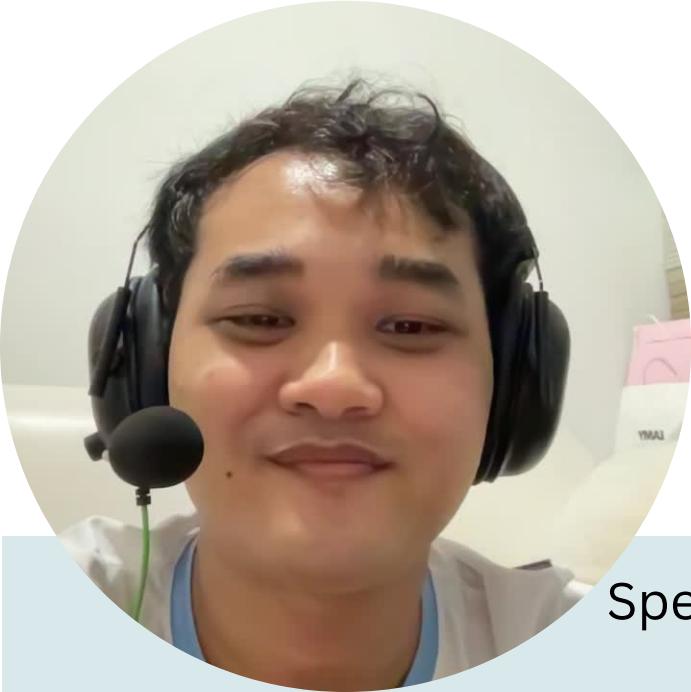
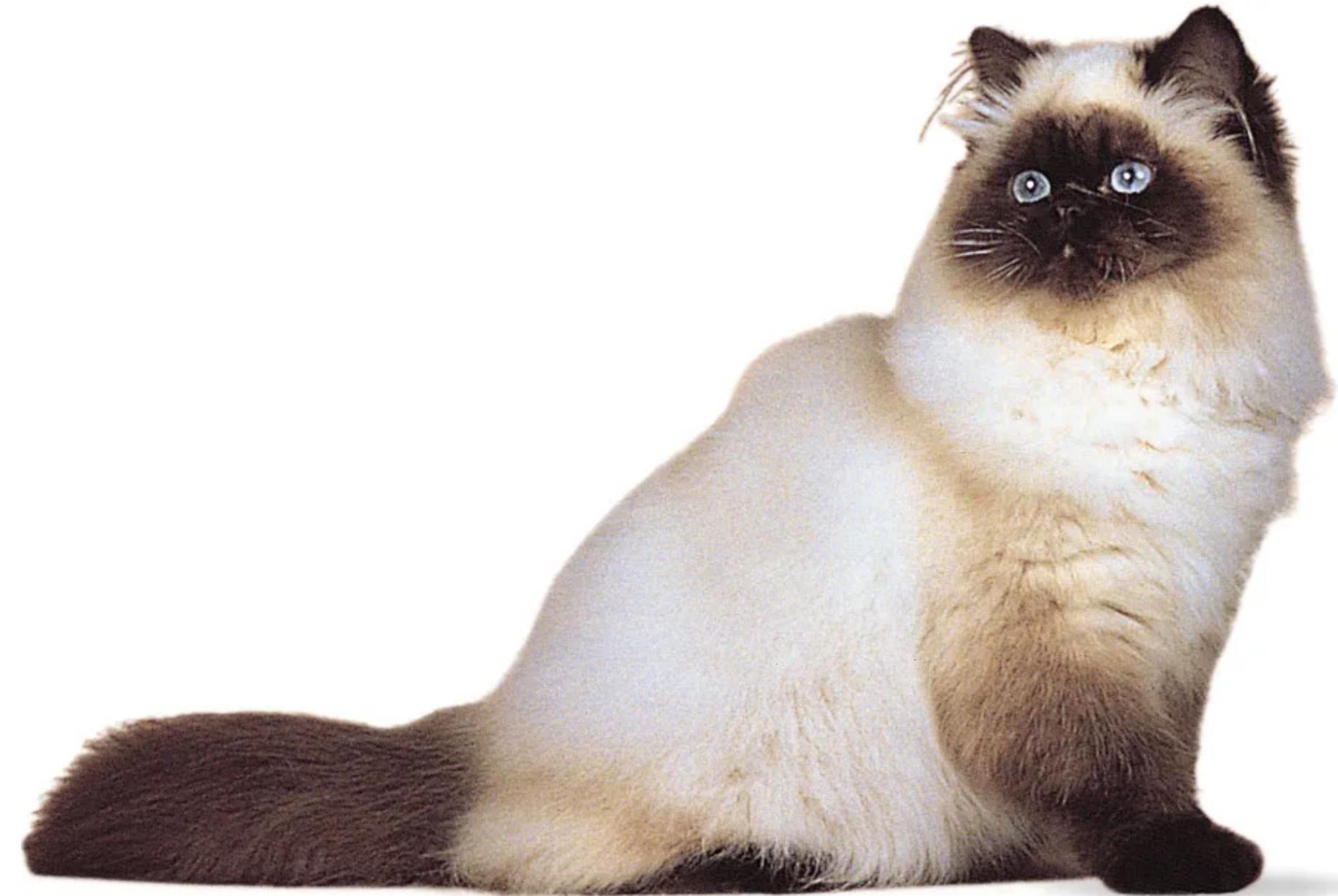
Redundancy in image



<https://www.britannica.com/animal>



Redundancy in image



<https://www.britannica.com/animal>

Redundancy in image

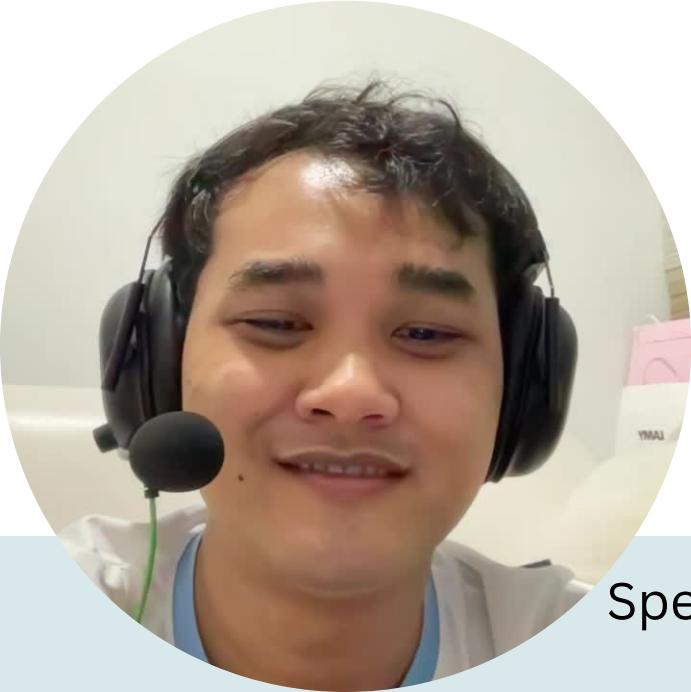
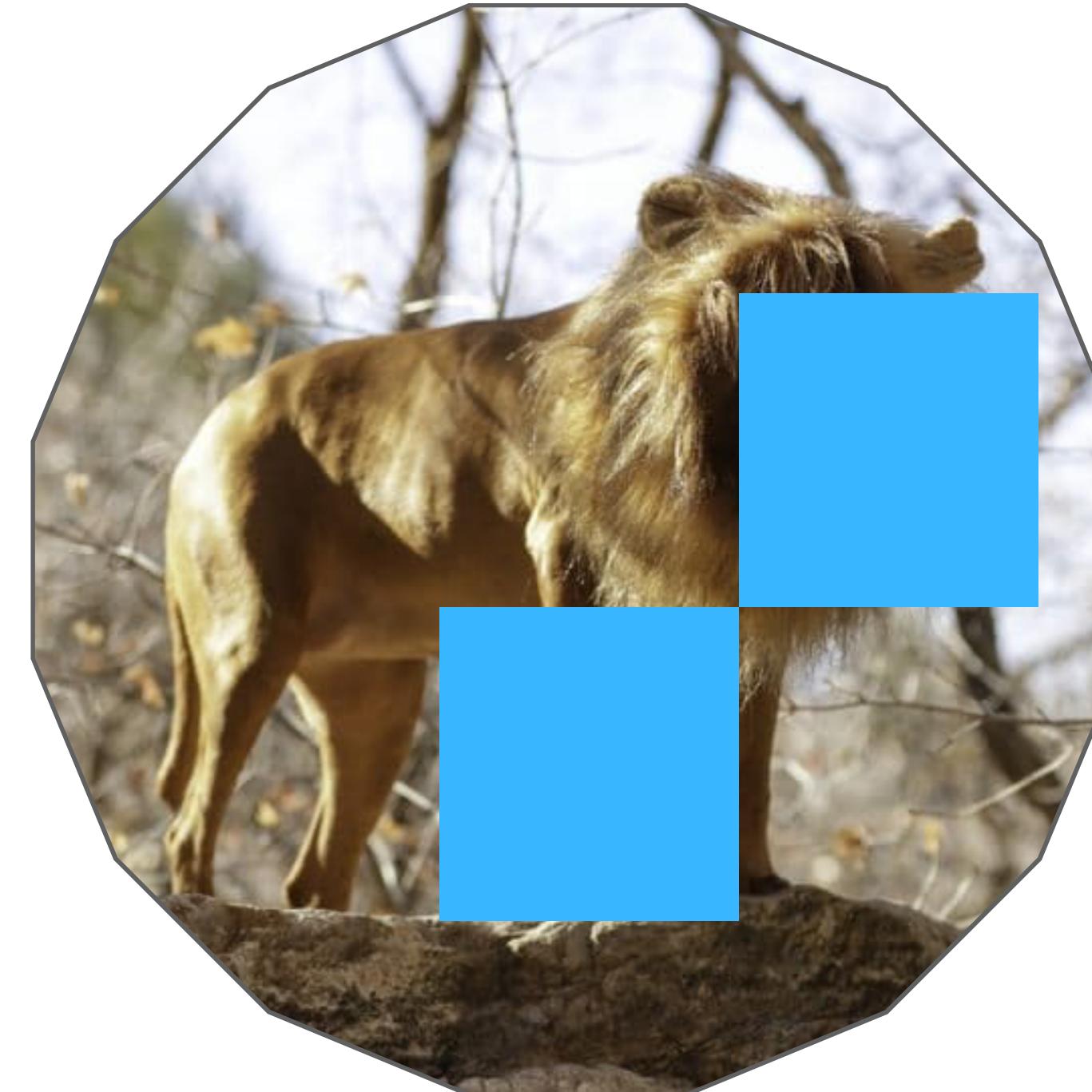


Speaker: Waragon Phusuwan

Session: Intro

Module : Dimensionality Reduction

Redundancy in image



Speaker: Waragon Phusuwan

Session: Intro

Module : Dimensionality Reduction

Redundancy in image

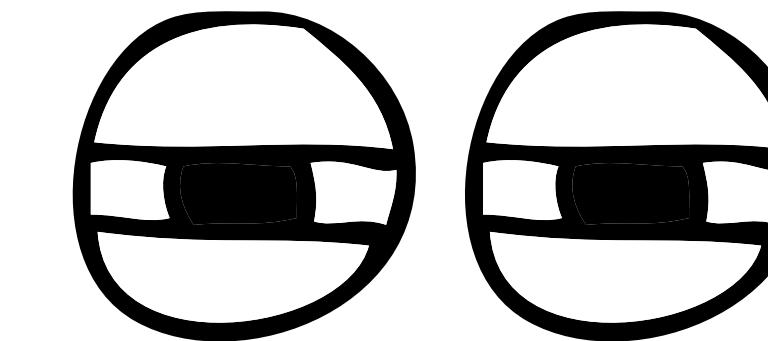


Speaker: Waragon Phusuwan

Session: Intro

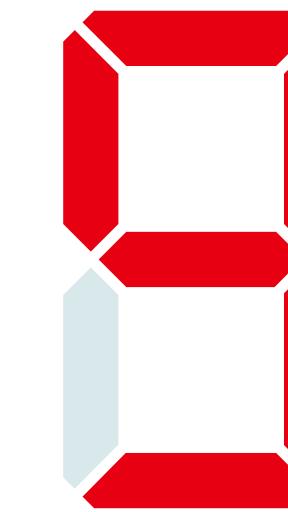
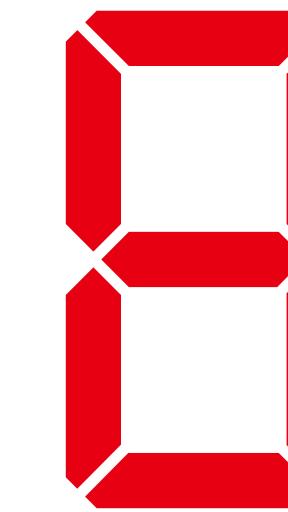
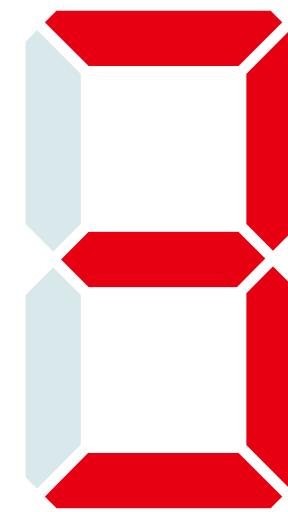
Module : Dimensionality Reduction

Intro to the class



How?

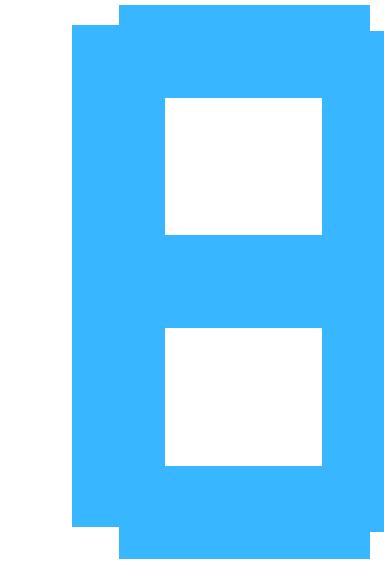
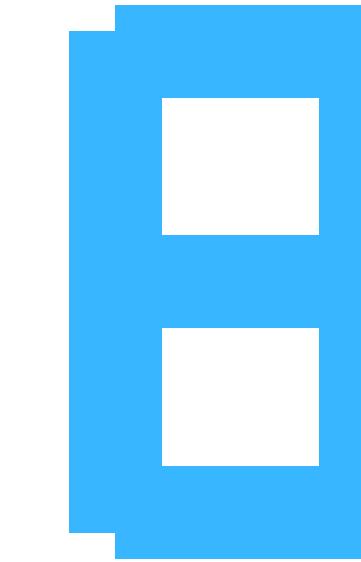
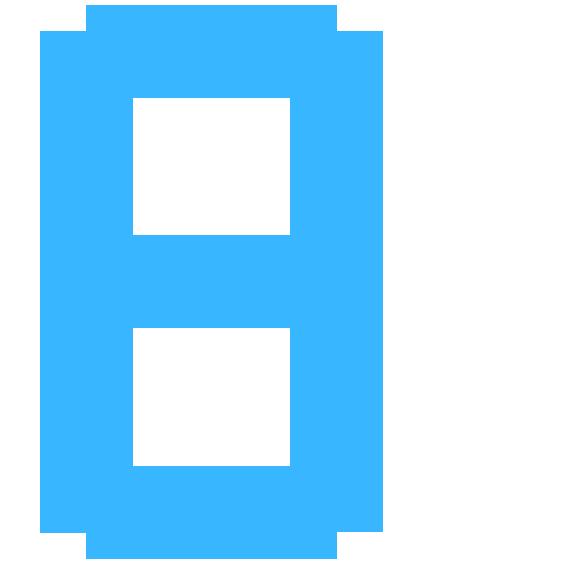
Intro to the class



7 segment
7 dimension



Intro to the class



Speaker: Waragon Phusuwan

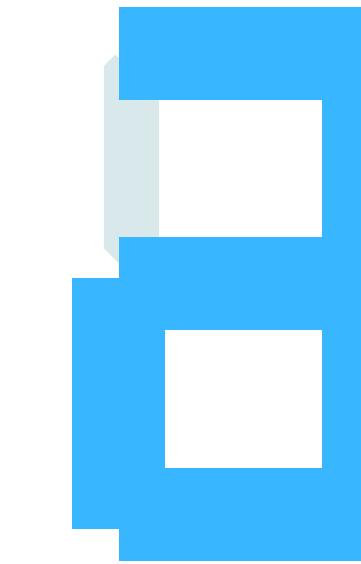
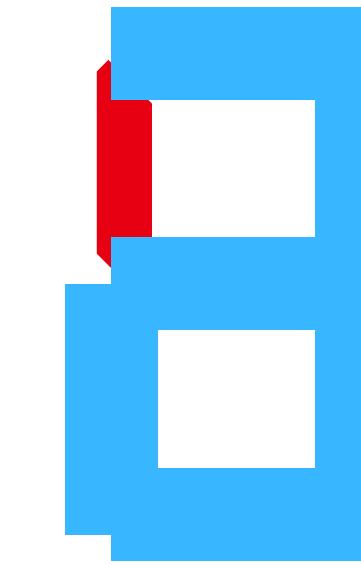
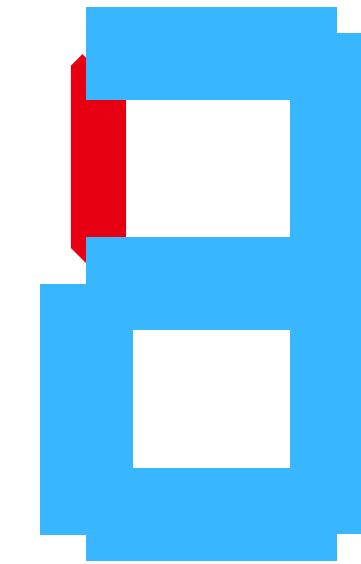
Session: Intro

Module : Dimensionality Reduction

Ans.

8 8 8

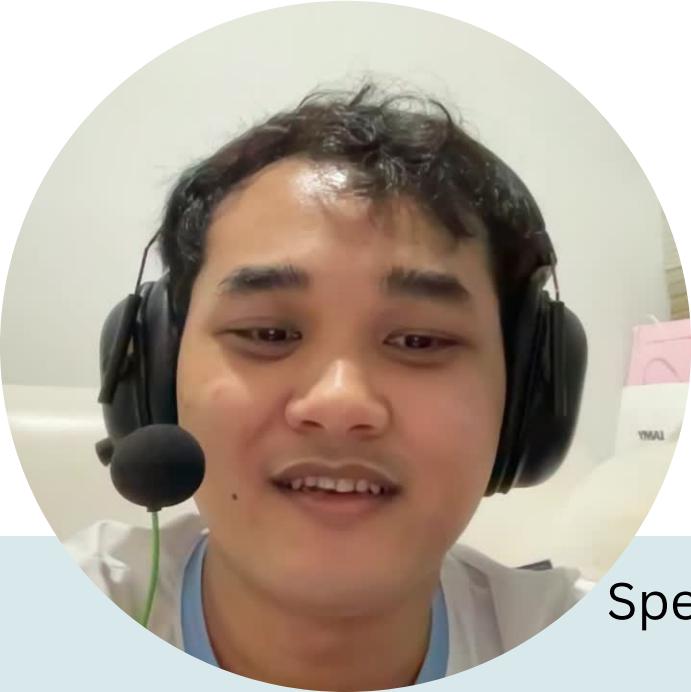
Intro to the class



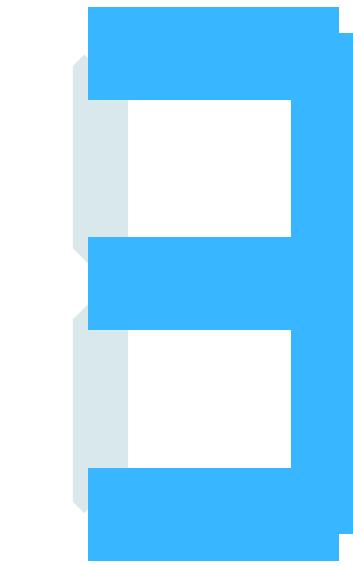
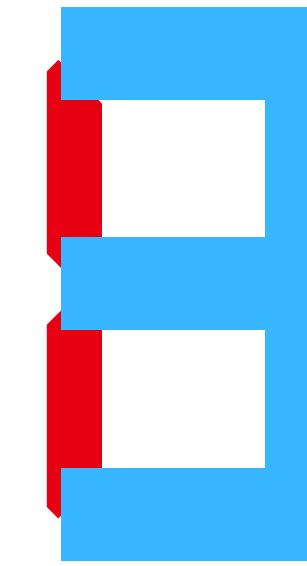
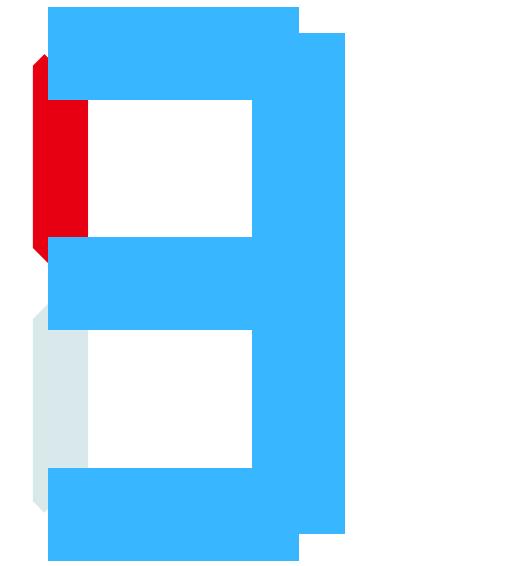
8

Ans.

8 8 8



Intro to the class



8

8

8

Ans.

8 8 8

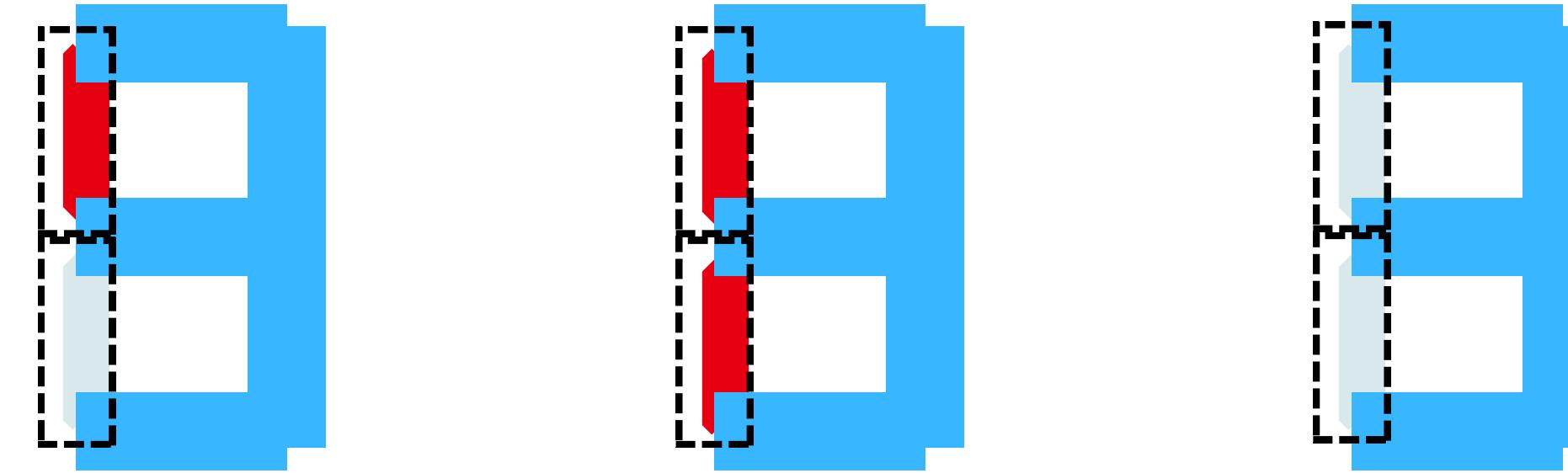


Speaker: Waragon Phusuwan

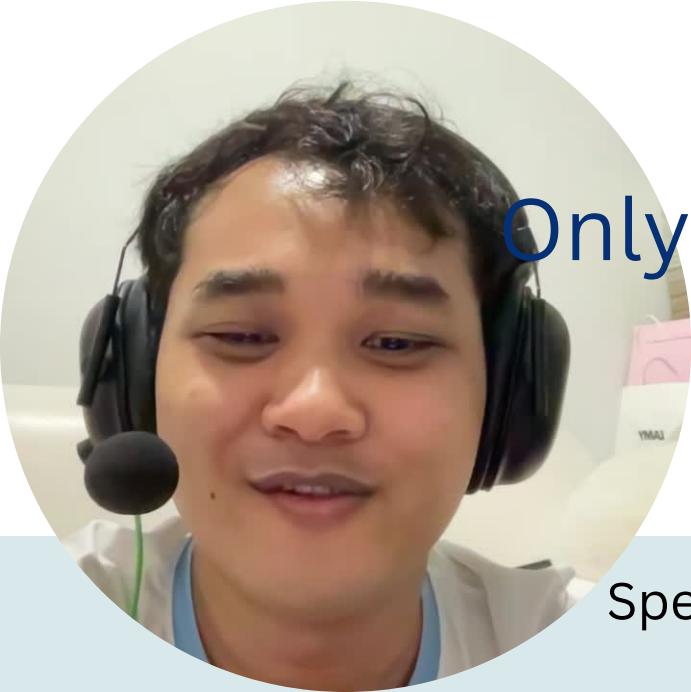
Session: Intro

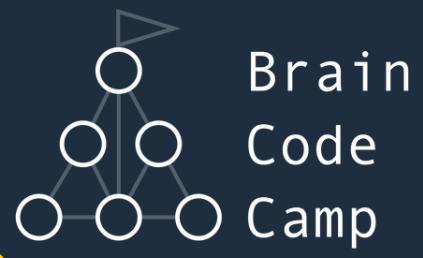
Module : Dimensionality Reduction

Intro to the class

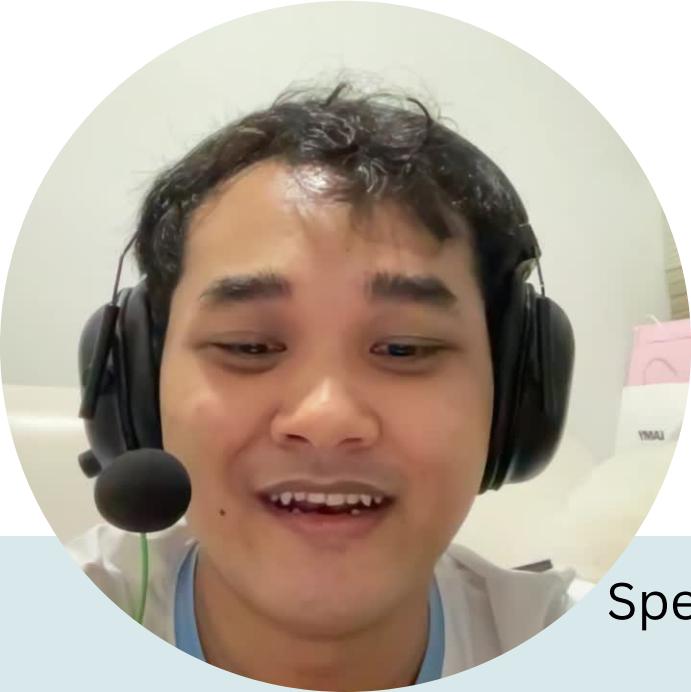


Only 2 out of 7 dimension has enough information to classify 3 8 and 9





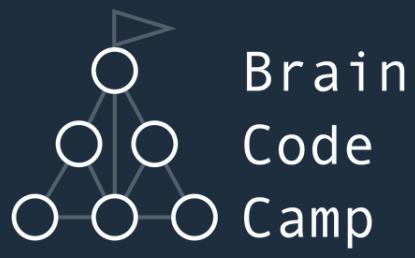
How to do this?



Speaker: Waragon Phusuwan

Session: Intro

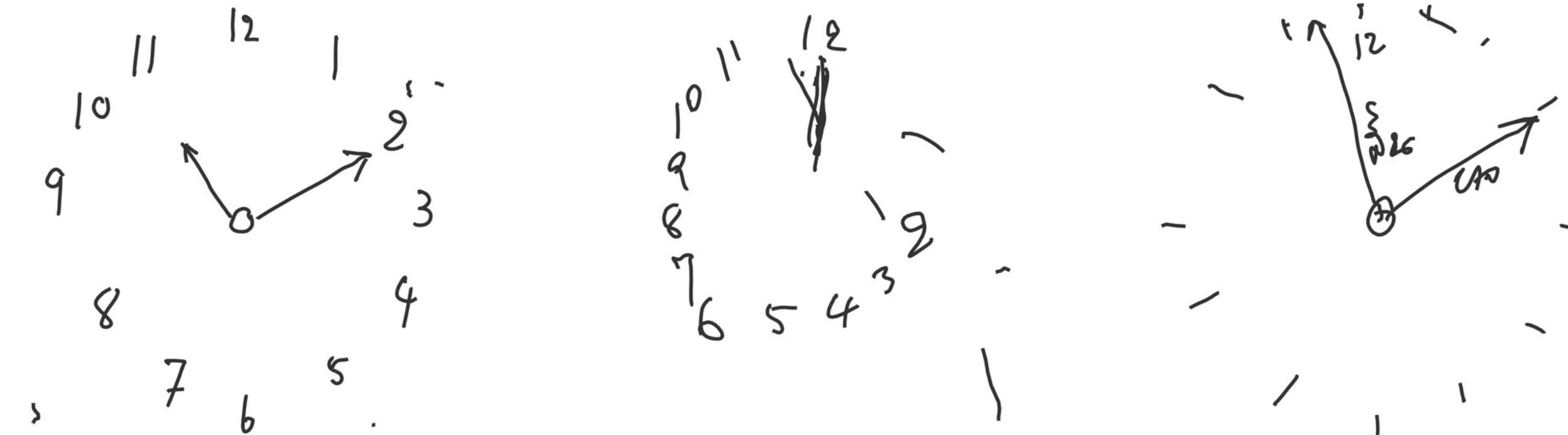
Module : Dimensionality Reduction



How about this?



How about this?



Speaker: Waragon Phusawan

Dimensionality Reduction

Module: Dimensionality Reduction



How to do with all these?

Let's go to the class



Speaker: Waragon Phusuwan



Session: Intro

Module : Dimensionality Reduction