

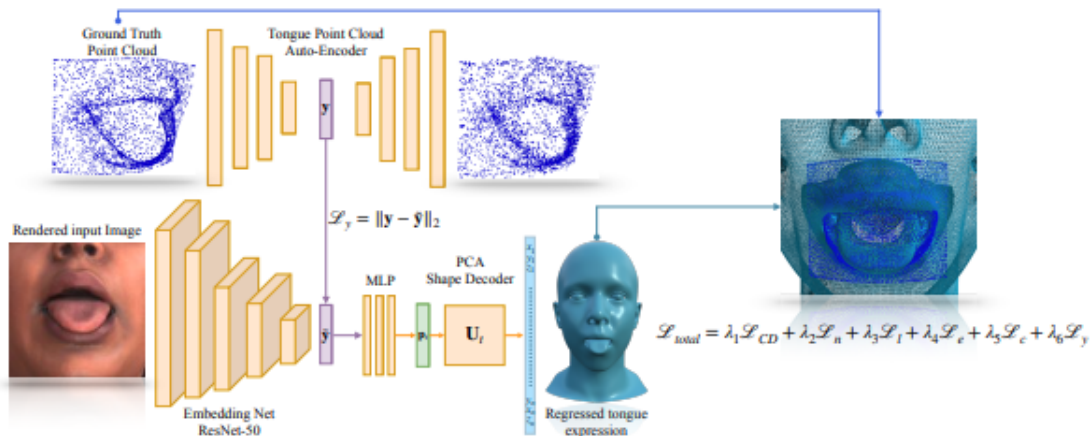


INSTRUCTIONS:

- Attempt All:** There are **9** questions spread over **2** pages, make sure you have all the printed pages.
- Allowed:** calculator + printed material/books/handwritten notes. **Prohibited:** share/exchange
- Required:** mention of any reasonable assumptions that you make to logically answer the question. Answers without sufficient logical justification would not have any value.

1. Consider the deep learning NN architecture below.

[10]



What problem it can solve and why. Determine important components, and their possible justification.

2. Explain the neural network architecture of Q, K, and V in the transformer? How they are combined in the computer vision domain?

[3+2]

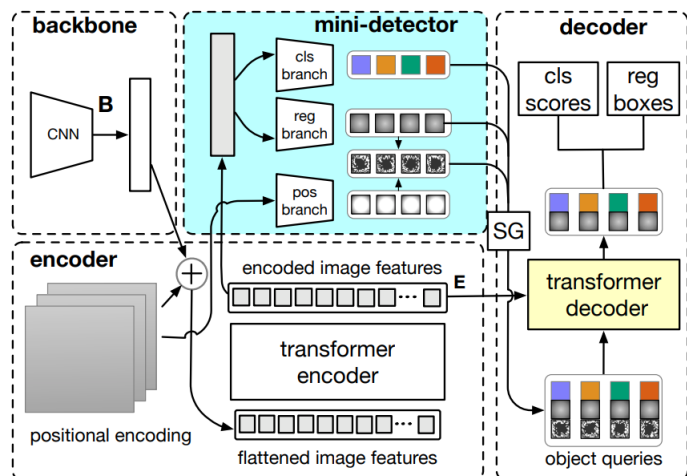
3. Assume that you want to develop a face recognition based gait crossing system. The system would be deployed in wild and is expected to work in full sunlight, evening, and night. Design components and their relevant deep learning architecture. No need to consider age variance.

[7]

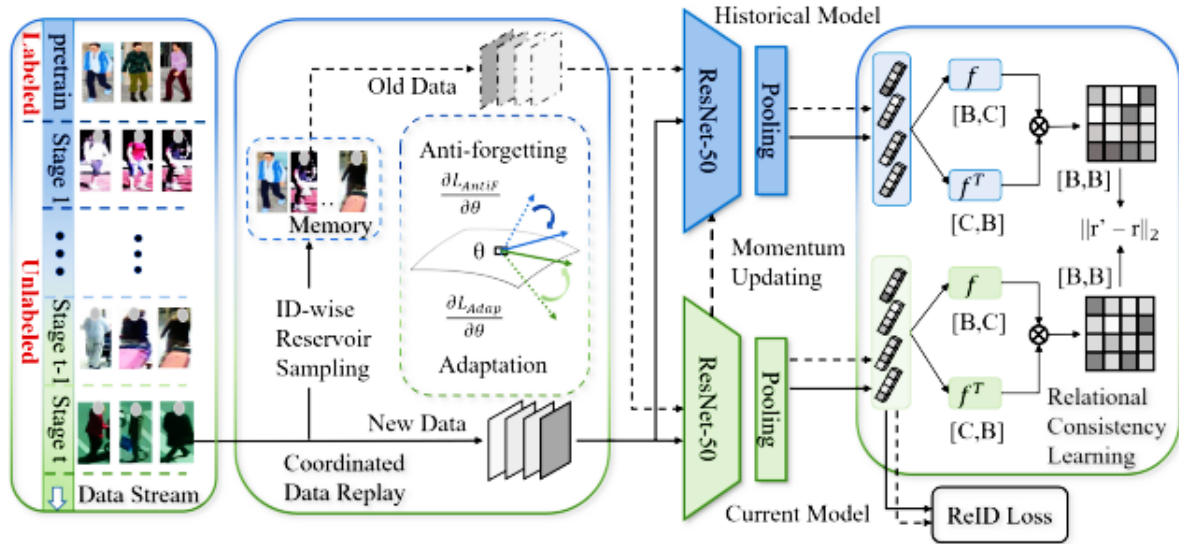
4. Consider the deep learning NN architecture below.

[10]

What problem it can solve and why. Determine important components, and their possible justification.



5. Consider the deep learning NN architecture below. What problem it can solve and why. Determine important components, and their possible justification. [10]



6. Consider **Nadam** optimizer that incorporate Nesterov Momentum into Adam. Explain how this changes the gradient computation. What is the possible justification of this proposal? [5+3]
7. Consider LSTM and GRU. Determine similarity and differences between the two. [6]
8. What advantage JSD brings over KLD? Compute JSD between the two distributions below. [1+5]

Distribution	Value of x								
	1	2	3	4	5	6	7	8	9
P(x)	0.30	0.20	-	0.20	-	0.15	-	0.05	0.10
Q(x)	0.10	-	0.20	0.10	-	0.10	0.30	0.15	0.05

9. Answers the questions below with sufficient detail and justification.
- (a) Steps to deploy DL models on web. [3]
- (b) How explainability can be brought in DL models? Mention any architectural idea. [3]
- (c) Do you agree or disagree with the statement below. [2]

Getting more information/data between two object could be associated with acquiring more attributes. The strategy of discovering as much attributes as possible for comparison is generally beneficial in terms of performance.

(provide justification)