LM in Artificial Intelligence
Image Processing and Computer Vision
01/09/2023

1) Describe the shape-based matching method. Provide a list of the main steps, with a brief description for each step. Then, describe the similarity function used for the matching with the relative mathematical formulation and the motivation behind its use. Finally, specify the variants of the similarity function that can be exploited to overcome issues that may arise in shape-based matching.

2) Describe in detail the motivating experiment for the introduction of Residual Networks (ResNets) and discuss if it shows underfitting or overfitting, justifying your answer and explaining why the architecture of ResNets should reduce it. Then, draw the two variants of residual blocks used in ResNets and compute their numbers of parameters and FLOPs. Use them to justify the introduction of the bottleneck variant. Finally, discuss why and how the standard residual block is modified at the beginning of a stage.