Title of your Assignment

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***Abstract*—*CRITICAL: Do Not Use Symbols, Special Characters, Footnotes, or Math in Report Title or Abstract.**

Two sentences of background and importance of this topic.

Two sentences defining the gap analysis (work not done in field) and your problem statement.

Two sentences of Results and your findings.

One sentence for significance of the results and your contribution.

In total, this section must consist of 180 words.

***Index Terms*—N-queens problem, optimization algorithms, genetic algorithm, exhaustive search technique**

I. General instructions

Comment out this section after completing your write up.

1) You must have exactly the mentioned sections with the mentioned number of paragraphs.
2) DO NOT DELETE ANY TEXT FROM THIS REPORT. JUST COMMENT OUT AND WRITE THE RELEVANT TEXT UNDER EACH COMMENT.
3) Observe the report page limits (minimum 5 pages without references) and limit on maximum text is 7 pages without references.
4) In case of figures, keep your raw data table also stored as excel file in this repository.
5) Each paragraph must consist of 7-10 sentences.
6) Add references where required.
7) Total references should be between 10 and 15.
8) Use latest references with 80% references later than 2020.
9) Use Google scholar for finding references and not Google or any other source.

II. Introduction

One paragraph on introducing the field and the topic of interest.

One paragraph on the importance of the selected topic [1].

One paragraph on why is it significant to work on this field/topic today.

A. Related Work

One paragraph defining the work that has been done on Genetic algorithms and N-queen's problem, with a table summarizing the work that has been done in literature as shown below in Table I.

B. Gap Analysis

One paragraph defining what has not been done or what is still missing in the field (gap analysis).

C. Problem Statement

Write a small paragraph explaining what N-Queen's problem is and what are its objectives. Then taking 10-Queens problem as sample, depict via three-in-one image(s), 1) how the empty board looks like, 2) with another image showing 10 queens (incorrectly placed with a description of why it is not the perfect solution) and 3) then image of one board with correctly placed 10 queens in it.

Following are the main questions addressed in this report.

1) Designing N-queen's problem solution using exhaustive search technique (Breadth-first/depth-first search algorithm).
2) Designing N-queen's problem solution using Genetic lgorithm.
3) Comparing both techniques with each other for a given sample size of queens.

D. Novelty of our work

One paragraph explaining your approach and novelty/contributions of your work.

E. Our Solutions

One paragraph on what you are doing in this report (your contributions) and a small one-two liner summary of your results.

III. Methodology

A. Overall Workflow

One paragraphs defining your methodology through a flow diagram of your work as shown in Figure **??**.

B. Experimental Settings

(Optional) One paragraph for hyper-parameter settings and network architecture as shown in Table II.

(Optional) One paragraph for experimental settings of your and competing methods (if any).

TABLE I
LITERATURE REVIEW TABLE SHOWING THE CONTRIBUTIONS OF VARIOUS AUTHORS FOR QUANTIZATION OF NETWORKS.

Paper Name	FCNs Used	L2 Error Minim.	Applied on				Signal Quantized	Dataset used	No. of bits	Layerwise sens. Analysis	Sem. segm.
			Conv. Layer	Skip Layer	Trans. Layer	Fully Conn. Layer					
Vanhoucke et al. [2]						✓	✓	×			
Courbariaux et al. [3]			✓			✓		MNIST, SVHN, CIFAR-10	10		
Gupta et al. [4]			✓			✓		MNIST, CIFAR-10	12		
Proposed Approach	✓	✓	✓	✓	✓	×	×	Pascal VOC 2012	2,3,4,5	✓	✓

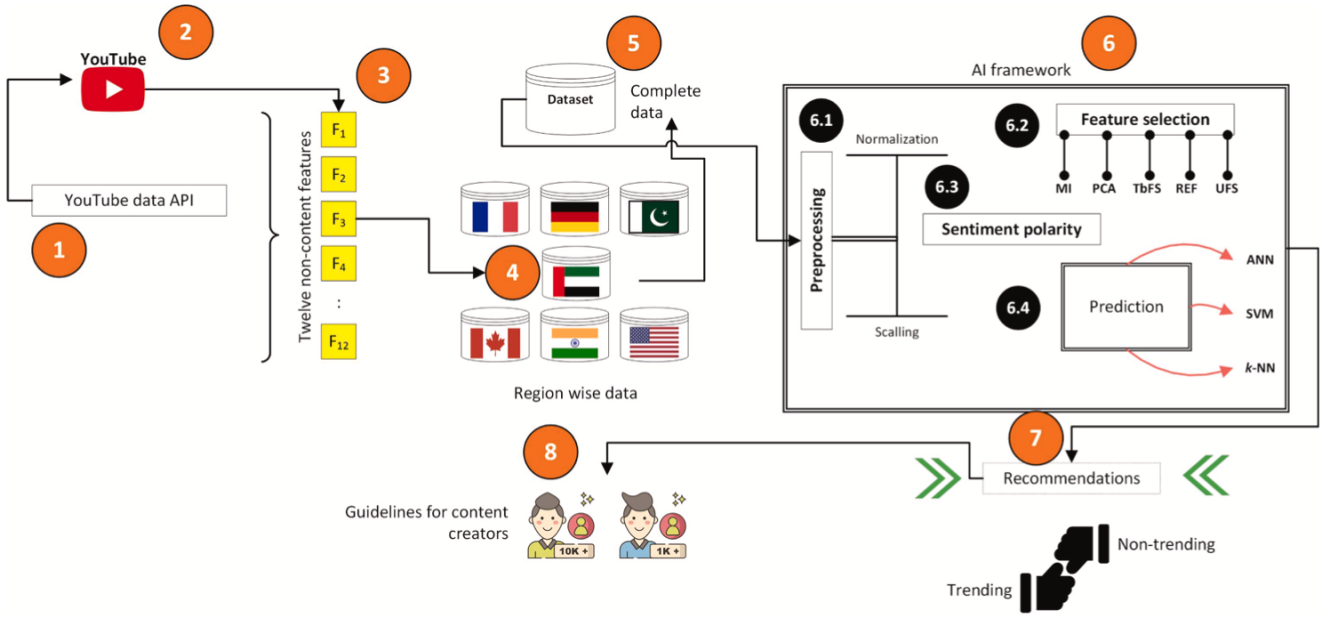

Fig. 1. The overall working of the proposed solution.

Fig. 1. Figure showing the flowchart proposed for FCN-8 quantization and the comparison pipeline followed (for quantization technqiues, i.e., Direct Quantization, Llyod's Quantizer and L_2 error minimization) in the current study based on pixel accuracy, mean IOU, and mean accuracy.

TABLE II
CONFIGURATION TABLE SHOWING THE NETWORK CONFIGURATION OF FCN USED IN THIS STUDY. THE TABLE SHOWS THE VARIOUS CONFIGURATION SETTINGS USED FOR FCN8.

Network Configuration	
Epochs	50
Learning rate	0.0001
Mini batch size	20
Optimizer	SGD
Momentum	0.9
Weight decay	0.0002
L_2 Regularization	None
Samples in training set	8498
Samples in validation set	786

IV. RESULTS

Three (or more) paragraphs explaining your results. At least one paragraph targeting one research question with at least one figure (preferably) or table (where figure is not possible). This section must contain only results and nothing else (not your own opinion or any sort of discussion on quality of results).

A sample figure is shown in Figure 2.

V. DISCUSSION

Three to four paragraphs discussing the results (at least one paragraph for each research question). Your opinion on how good/bad the results are. Draw inferences from the results here. Explain novelty of your contributions and what was missing that you have explored here. Any other point you would like to discuss related to this study.

A. Future Directions

One paragraph for what are the future directions in your opinion for continuing this study.

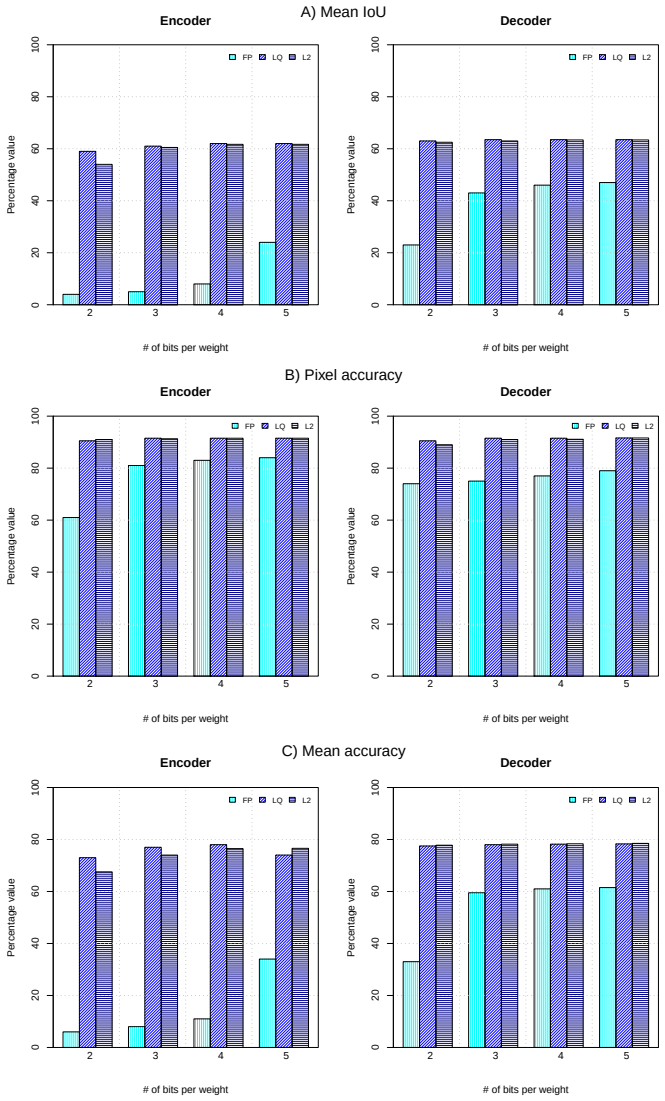

Fig. 2. Figure comparing the three quantization techniques Fixed Point (FP), Lloyd's quantizer (LQ) and L_2 error minimization (L_2) on the three performance metrics divided into encoder and decoder layers. Mean IoU is shown for the three techniques in Panel A), pixel accuracy in Panel B), and mean accuracy in Panel C) respectively. Note that FP is consistently worse than both LQ and L_2, while L_2 and LQ are of comparable accuracy. Also, FP is most sensitive to number of bits in all metrics while L_2 and LQ are relatively insensitive.

VI. Conclusion

One paragraph related to conclusions drawn from your whole experimentation.

In total this section must consist of 240-260 words.

References will be added automatically by using the following lines. Add the relevant citations in the attached bibliogrpahy.bib file. Get help from me where you want to work on citations.

References

[1] S. Norin, L. Postle, and Z.-X. Song, "Breaking the degeneracy barrier for coloring graphs with no kt minor," *Advances in Mathematics*, vol. 422, p. 109020, 2023.

[2] V. Vanhoucke, A. Senior, and M. Z. Mao, "Improving the speed of neural networks on cpus," in *Deep Learning and Unsupervised Feature Learning Workshop, NIPS 2011*, 2011.

[3] J. David, M. Courbariaux, and Y. Bengio, "Training deep neural networks with low precision multiplications," *Computer Science*, 2014.

[4] S. Gupta, A. Agrawal, K. Gopalakrishnan, and P. Narayanan, "Deep learning with limited numerical precision," in *International Conference on Machine Learning*, 2015, pp. 1737–1746.