DENTAL HEALTH CLASSIFICATION USING CNNs

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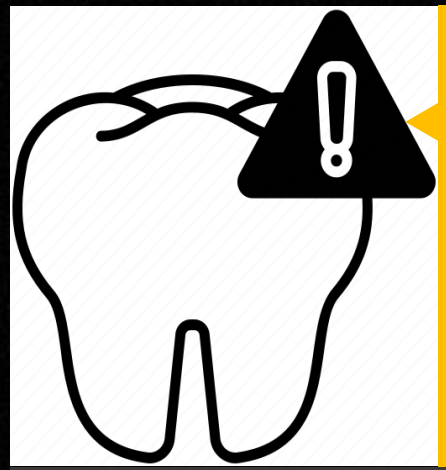
Problem Statement & Solution



- Manually analyzing dental X-rays is time-consuming and prone to errors.
- Dentists require automated tools to detect cavities, fillings, implants, and impacted teeth.

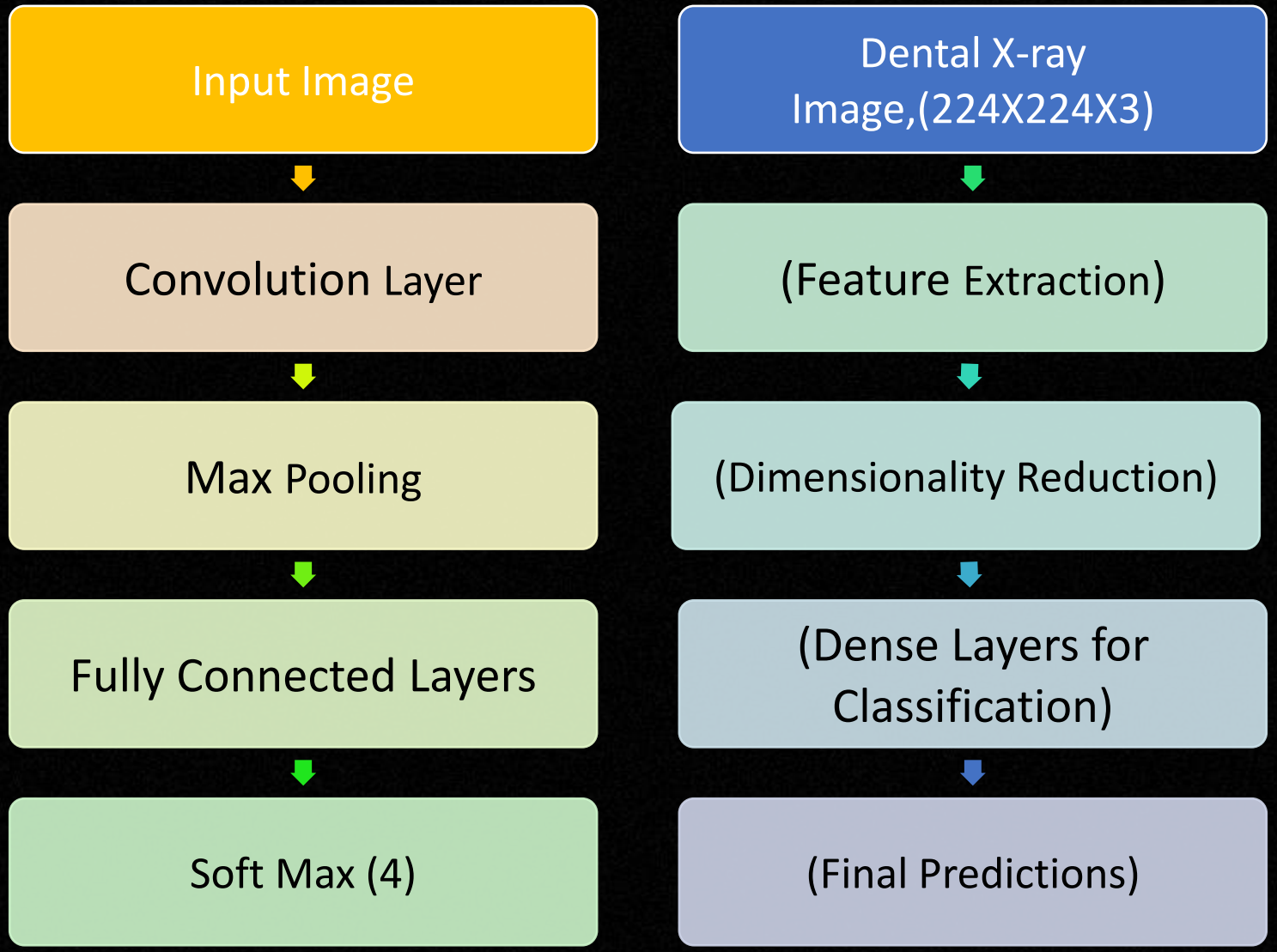
- A deep learning-based CNN model that classifies X-ray images into dental categories.
- This solution provides fast, accurate, and automated analysis, assisting dentists in diagnostics.

Dataset & Model :

https://www.kaggle.com/code/banddaniel/dental-x-rays-classification-test-f1-score-0-72

1. Dataset consists of four categories :
   - Cavities
   - Fillings
   - Implants
   - Impacted Tooth
2. Model : A Custom CNN model

CNN Architecture



Model Comparison

S.No	Feature	V1 (Baseline)	V2 (Initial Training)	V3 (Improvements)	V4 (Fine-Tuned)
0	Number of Conv Layers	2 Conv Layers	3 Conv Layers	4 Conv Layers	4 Conv Layers
1	Batch Normalization	No	No	Yes	Yes
2	Dropout Rate	0.5	0.5	0.6	0.5
3	Batch Size	32	32	16	32
4	Fully Connected Neurons	128	256	128	160
5	Learning Rate	0.001	0.0005	0.0003	0.00003
6	Data Augmentation	No	Yes	Yes	Yes (More)
7	Final Training Accuracy	36.77%	44.16%	44.52%	76.60%
8	Final Test Accuracy	33.34%	44.12%	45.14%	66.21%

Thank you for your time and attention

Healthy Teeth For A Happy Smile

Open for Queries, Feedback and Discussions