BRAINSTATION

Advanced Skin Segmentation for Enhanced Image Processing and Computer Vision Applications

Presented by: Daryl Wanji

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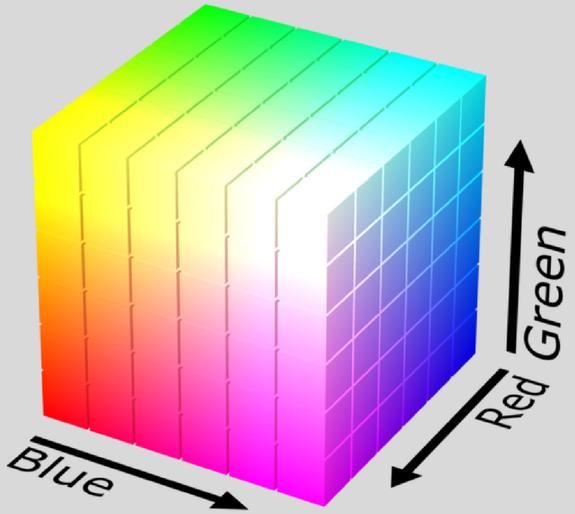
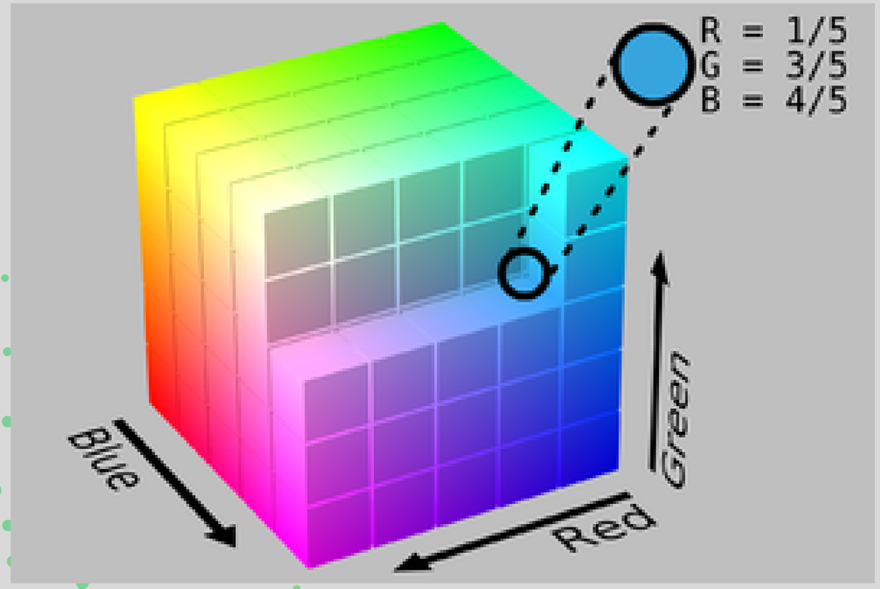
Overview

Image Processing and Machine Learning

- Accurately classify skin and non-skin regions in images for applications such as facial recognition, human-computer interaction, and medical diagnostics.
- Improved skin segmentation enhances various technological applications.





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VISION

Developping a robust classification model using machine learning.

- Utilize R, B, and G color space data from diverse face images.
- Model that performs well across different demographics and conditions.

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IMPACT

MEDICAL BENEFITS

- Early and accurate detection of skin conditions can lead to timely treatments, potentially saving lives and reducing healthcare costs.

FORENSIC ANALYSIS AND LAW ENFORCEMENT

- This can improve applications in various industries, including entertainment, retail, and healthcare (virtual surgery simulations). Enhanced AR experiences can lead to higher user satisfaction and engagement.

PRIVACY PROTECTION

- Precise skin segmentation can aid in anonymizing images by identifying and blurring or masking sensitive skin regions, thus protecting individuals' privacy.

DIVERSITY AND INCLUSIVITY IN TECHNOLOGY

- This fosters a more inclusive digital environment where technology is accessible and effective for all users, regardless of their background, contributing to equity and diversity in the tech industry. Yann LeCun vs Gebru 2020 - https://x.com/timnitGebru/status/1274814264805429248

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Dataset

- RGB Color Intensity ranging from 0-255
- Y - Label for Skin/Non-skin Classification
- 245057 observations

Feature Name	Description	Type	Range
R	Red color intensity	Int	0-255
G	Green color intensity	Int	0-255
B	Blue color intensity	Int	0-255
Y	Skin/Non-skin classification label	Int	0 (non-skin), 1 (skin)

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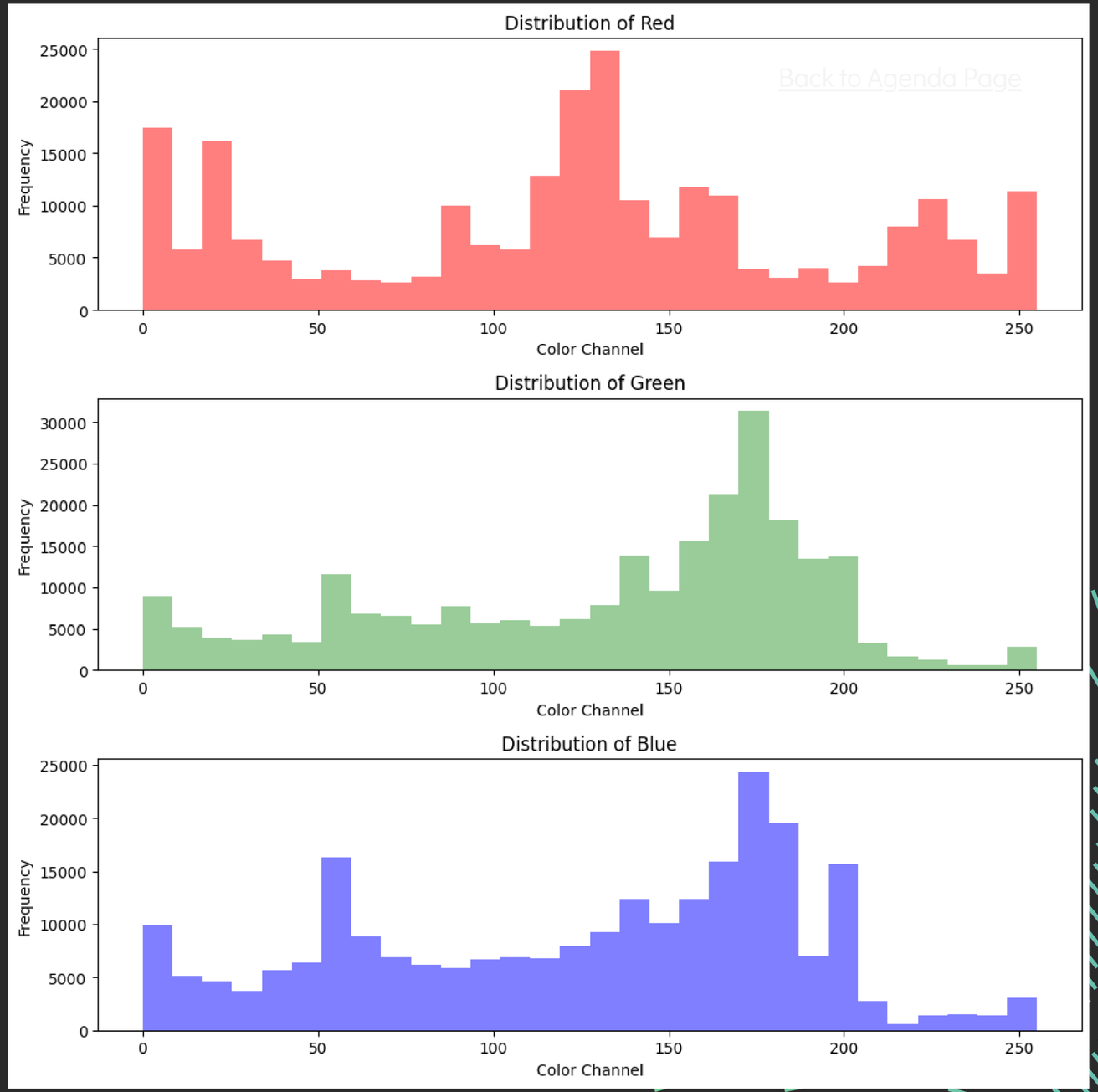
EDA

Preliminary Exploration

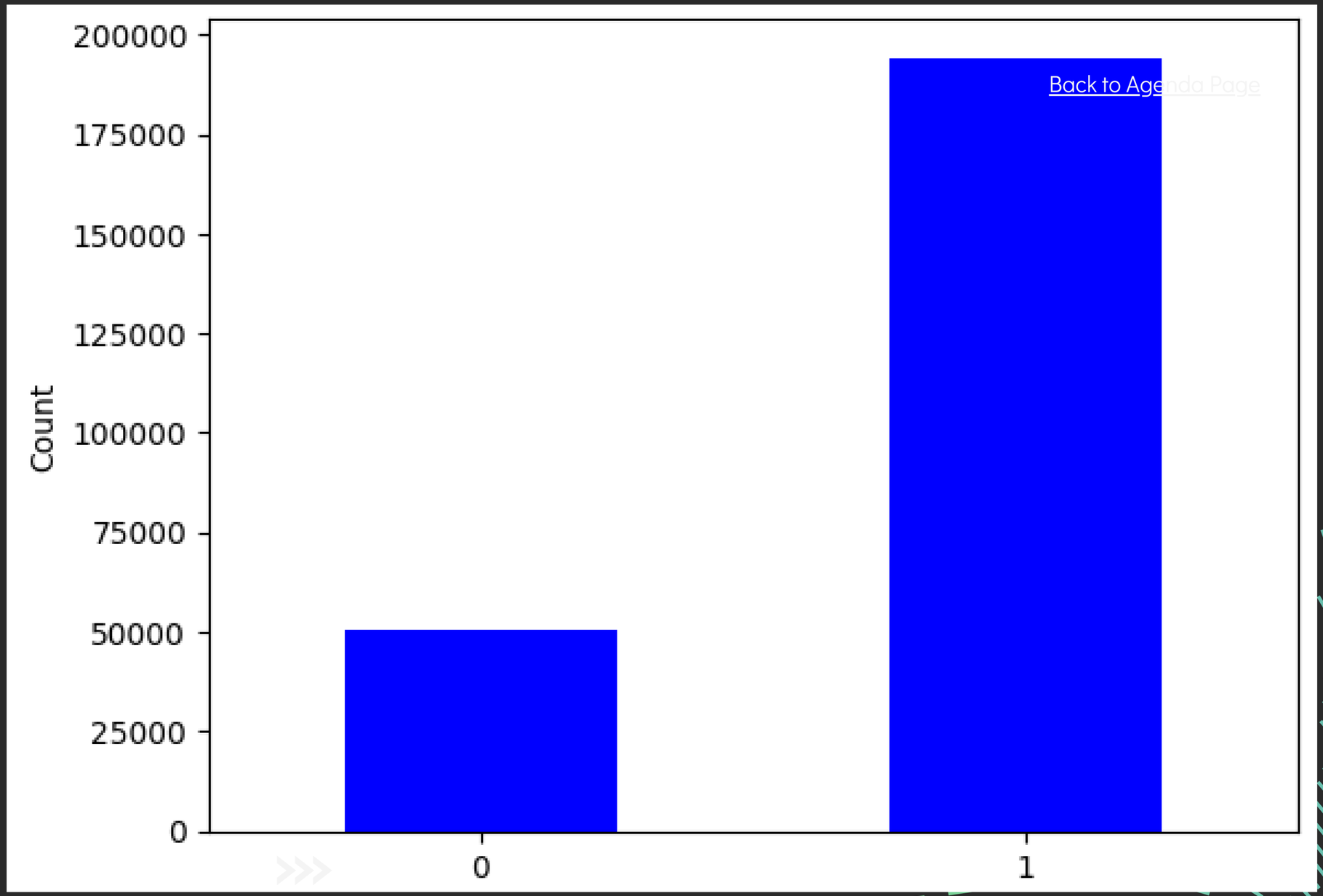
- Blue Hist: See a peak around 175.
- Green Hist: Similar distribution to the Blue and sees a peak at around 175 as well.
- Red Hist: The distribution is more spread out with a peak at around 125.



EDA

Preliminary Exploration

- Class Imbalance
- Baseline Model : ~ 80



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