

# Image Background Replacement

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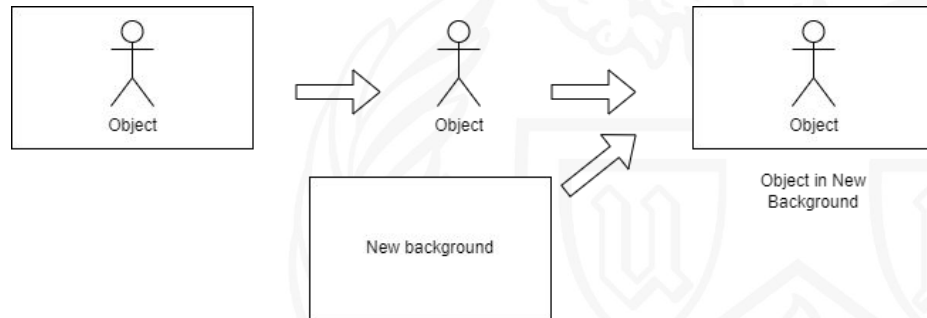
# Overview

- Problem Statement
- Previous work
- Proposed Methodologies
- Results
- Further Work



# Problem Statement

- Image background replacement
- Can be formulated as foreground extraction
- Background can be changed into a different color or an image
- For simplification, tested on a uniform color background



# K-Means Clustering

- $K=2$  for segmentation
- Gaussian blur to reduce noise/sharp features in images with high noise/sharp features
- Human interference required to indicate which class is foreground



# Grabcut with Otsu's thresholding

- Gaussian blurring
- Otsu's thresholding
- Grabcut initialized with Otsu's mask
- Otsu's thresholding inefficient in cases where object pixels intensities are similar to background
- Based on assumption that foreground is always greater than threshold

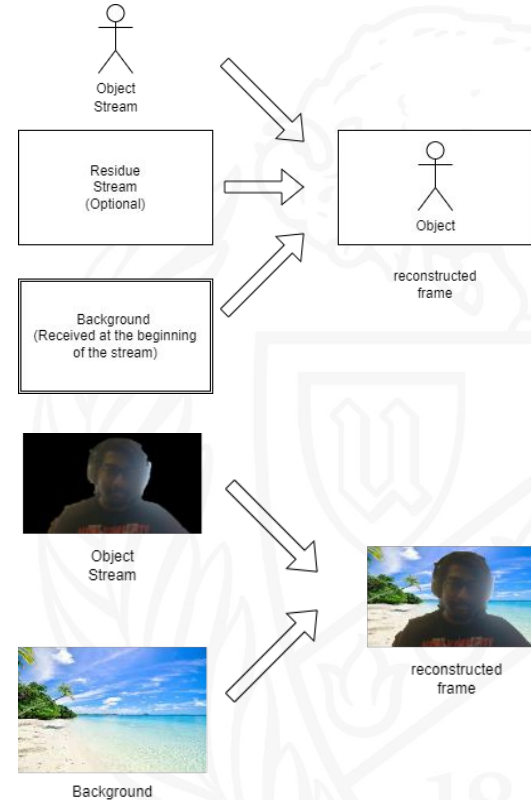
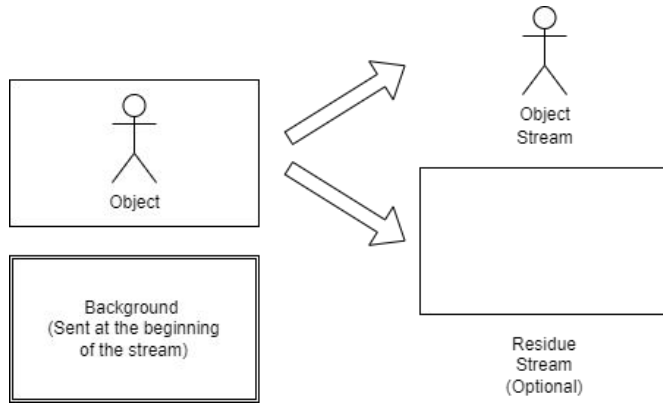


# Grabcut with DeepLab mask

- Generate background/foreground mask with help of DeepLabv3 model
- Mask often inefficient with some parts of background also extracted as foreground
- Grabcut to finetune/polish the DeepLab mask response
- Has a small observable boundary on the output but can be taken care of
- Most consistent output compared to rest



# MPEG-4 Realization





Thank You!

