PHOTO/VIDEO EFFECT CREATION ON A PERSON USING CONVOLUTIONAL NEURAL NETWORKS

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Table of contents

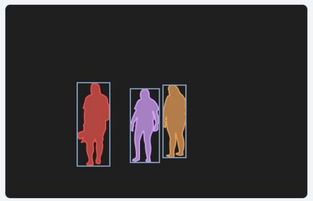
1. Introduction

1.1 Problem Definition

Create photo/video effects using person segmentation techniques

(a) Image

(b) Semantic Segmentation



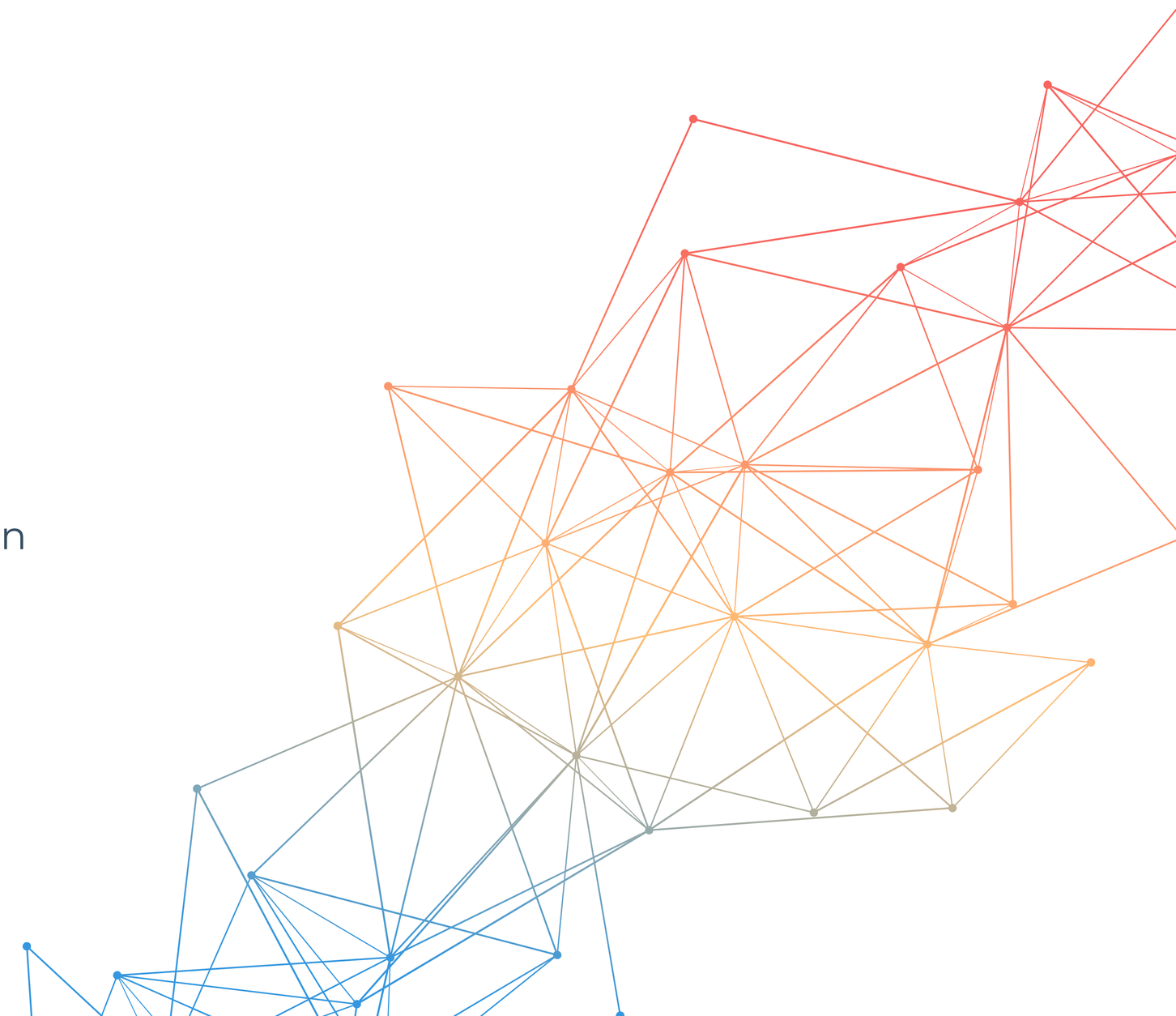
(c) Instance Segmentation

(d) Panoptic Segmentation

2. Literature review

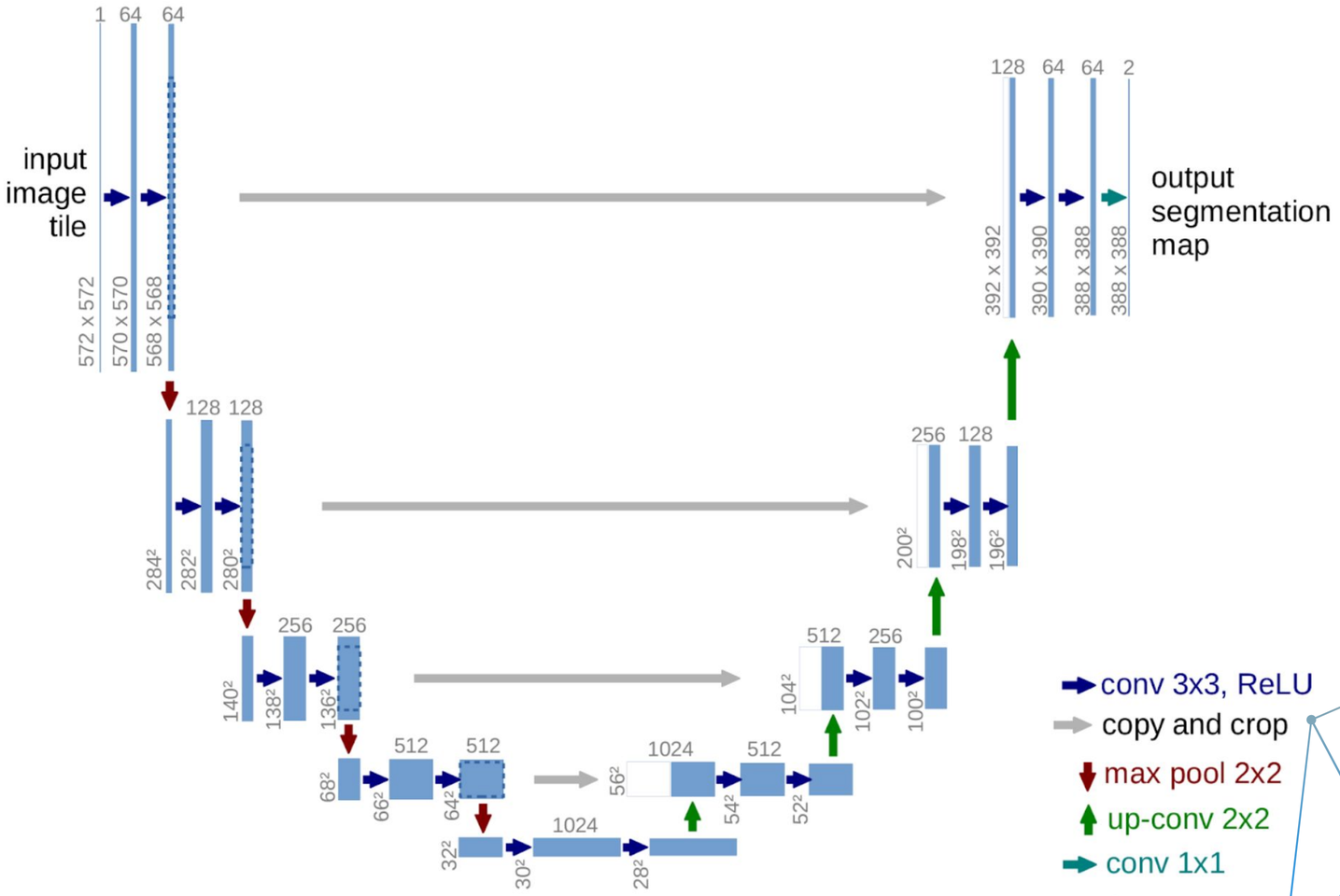
2.1 Techniques

- **Threshold**-based segmentation
- **Edge**-based segmentation
- **Region**-based segmentation
- **Clustering**-based segmentation
- **Neural**-**networks**-based segmentation



3. Approach

3.1 U-Net Architecture



4. Training and evaluation

4.1 Data collection

- **18,500** portraits for training
- **3,500** portraits for testing
- Image size: **128 x 128**

4.2 Model training

- **Epochs:** 5
- **Batch size :** 64 images

4. Training and evaluation

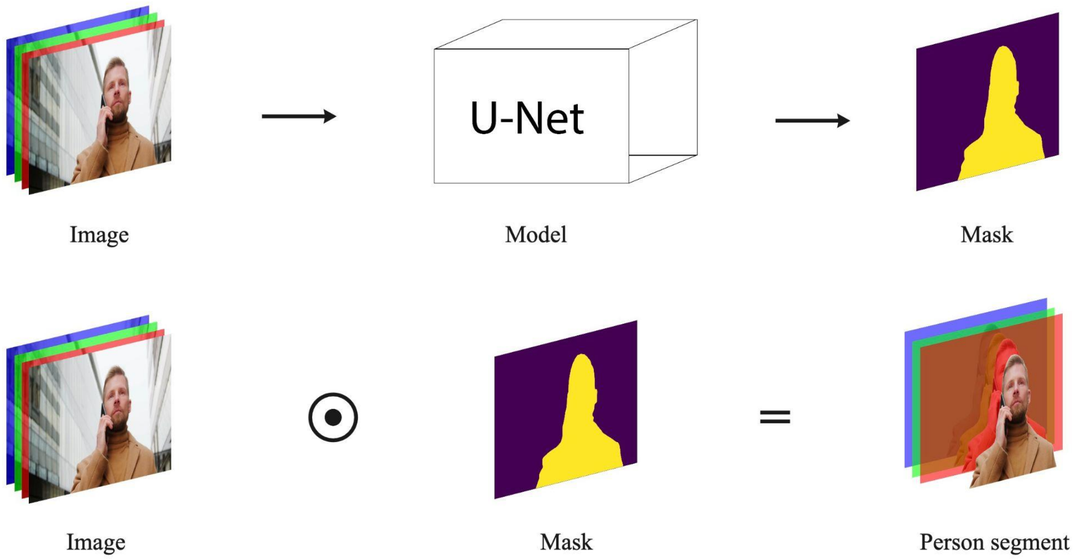
4.2 Evaluation

- **IoU Score:** 0.9648
- **Per-frame execution time**

Resolution (px.)	Mean value (sec.)	Median value (sec.)
128x128	0.077	0.073
256x256	0.15	0.147
512x512	0.545	0.538

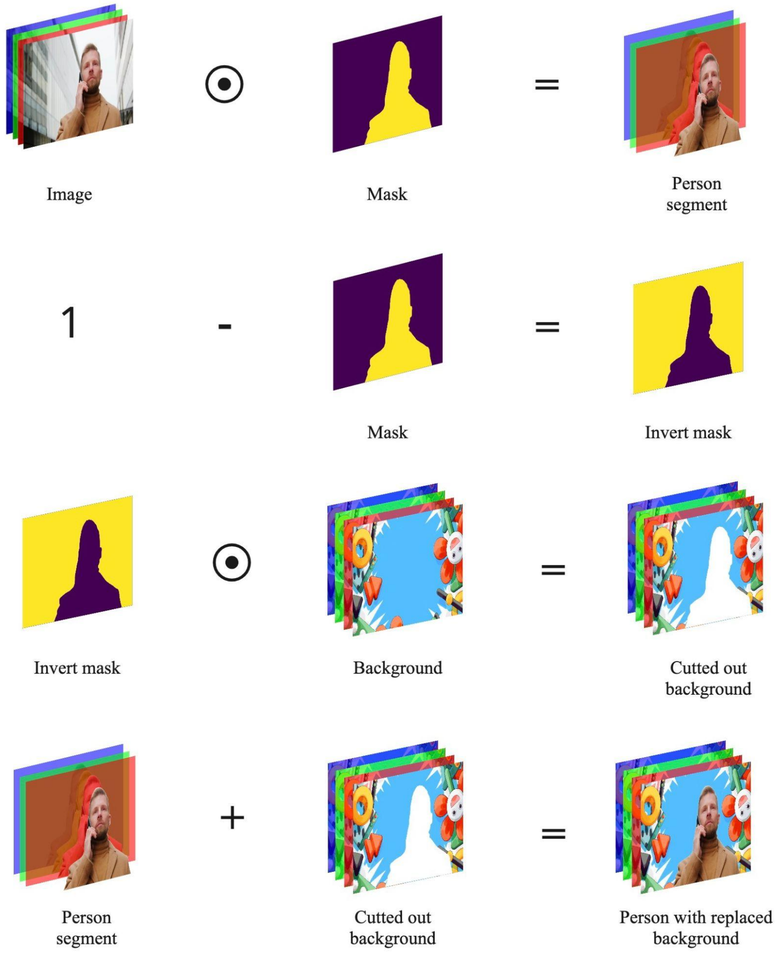
5. Effects

5.1 Background Removal



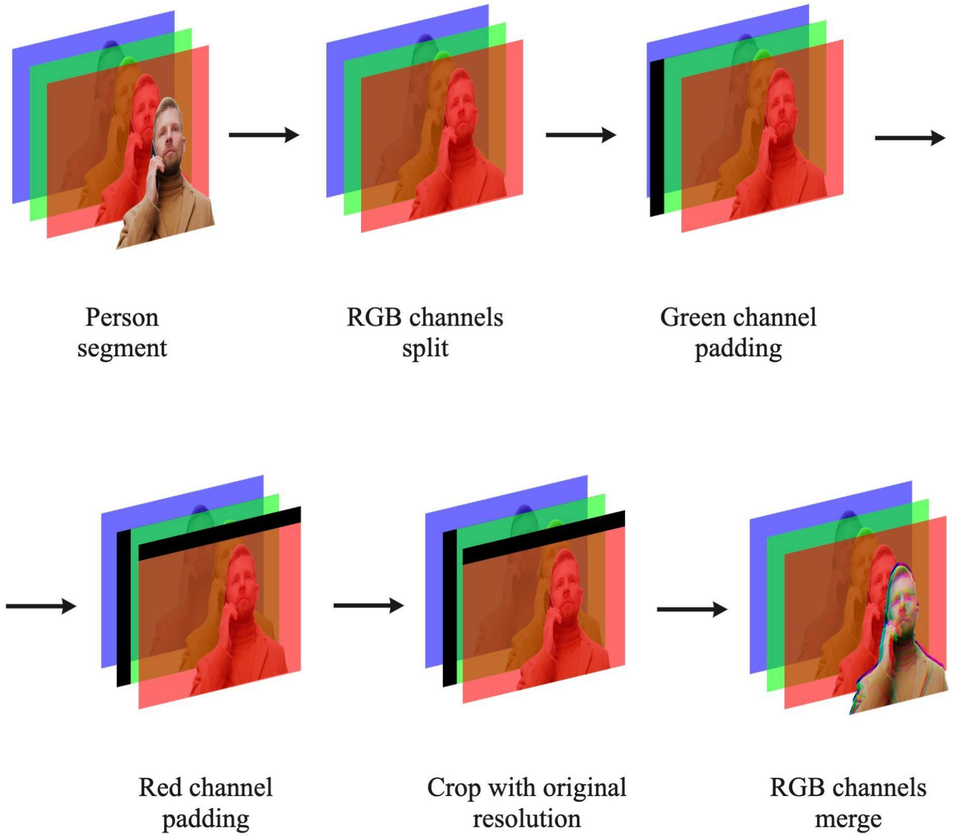
5. Effects

5.2 Background Replacement



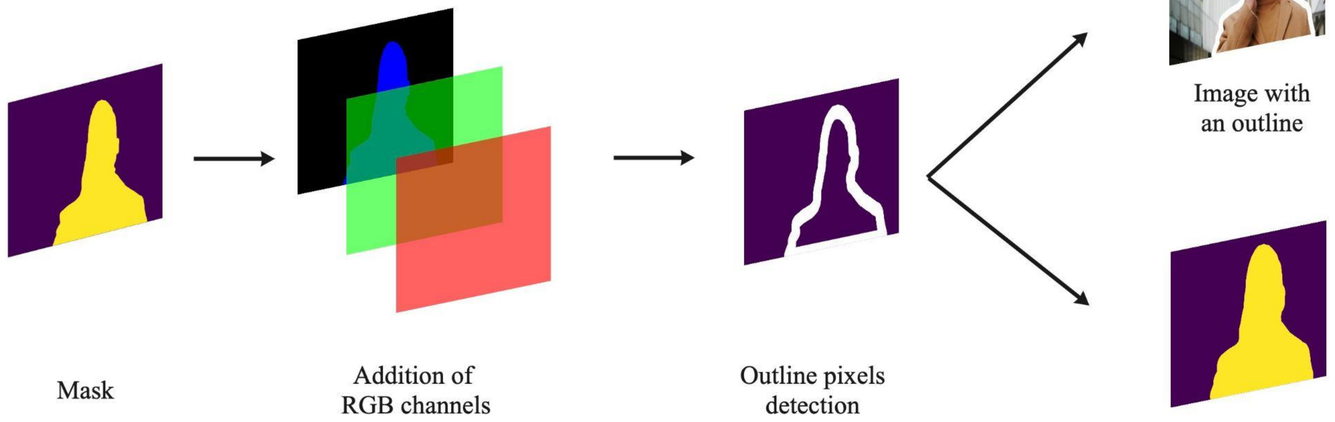
5. Effects

5.3 RGB Glitch



5. Effects

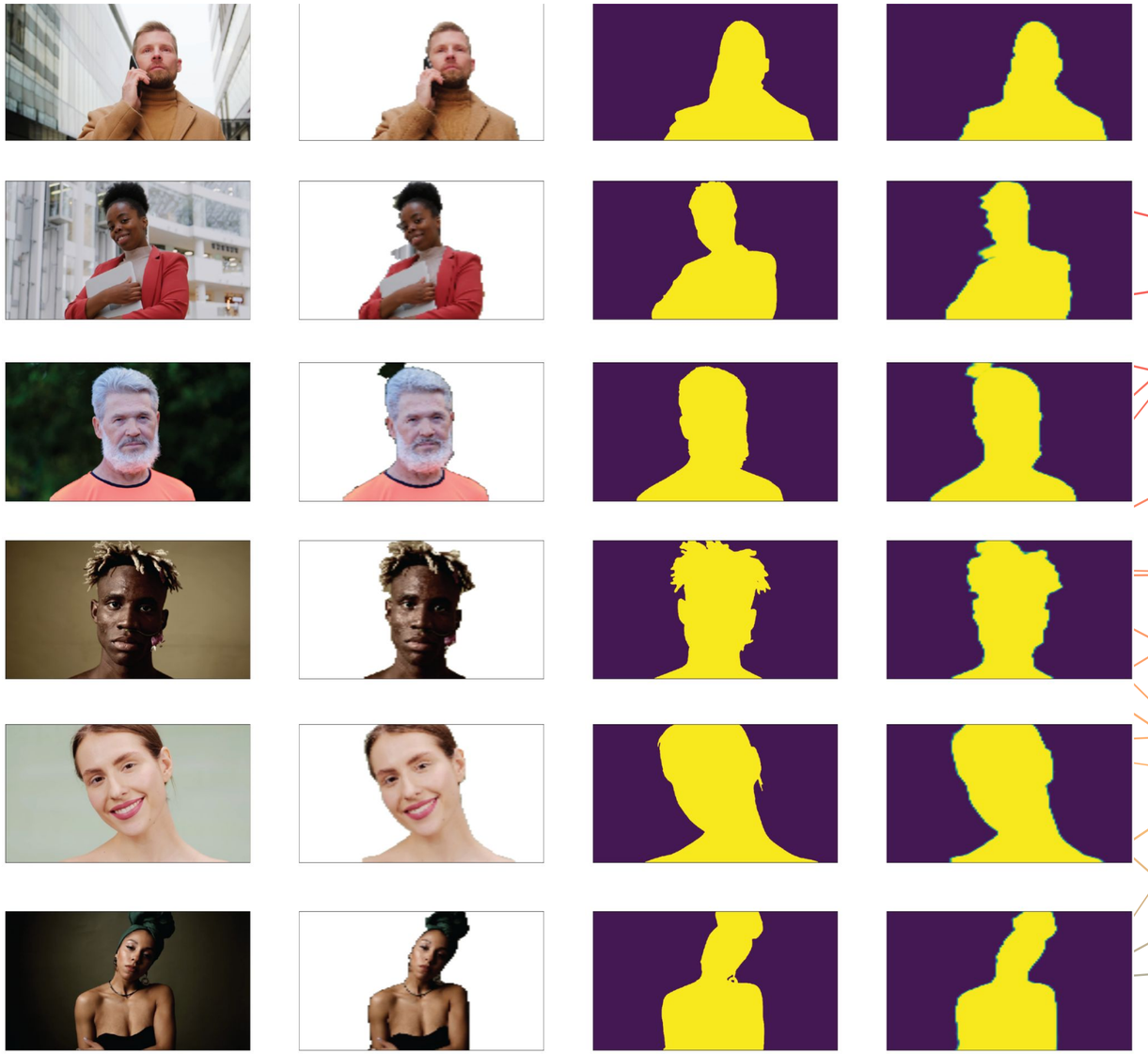
5.4 Person Outline



6. Results

6.1 Background removal

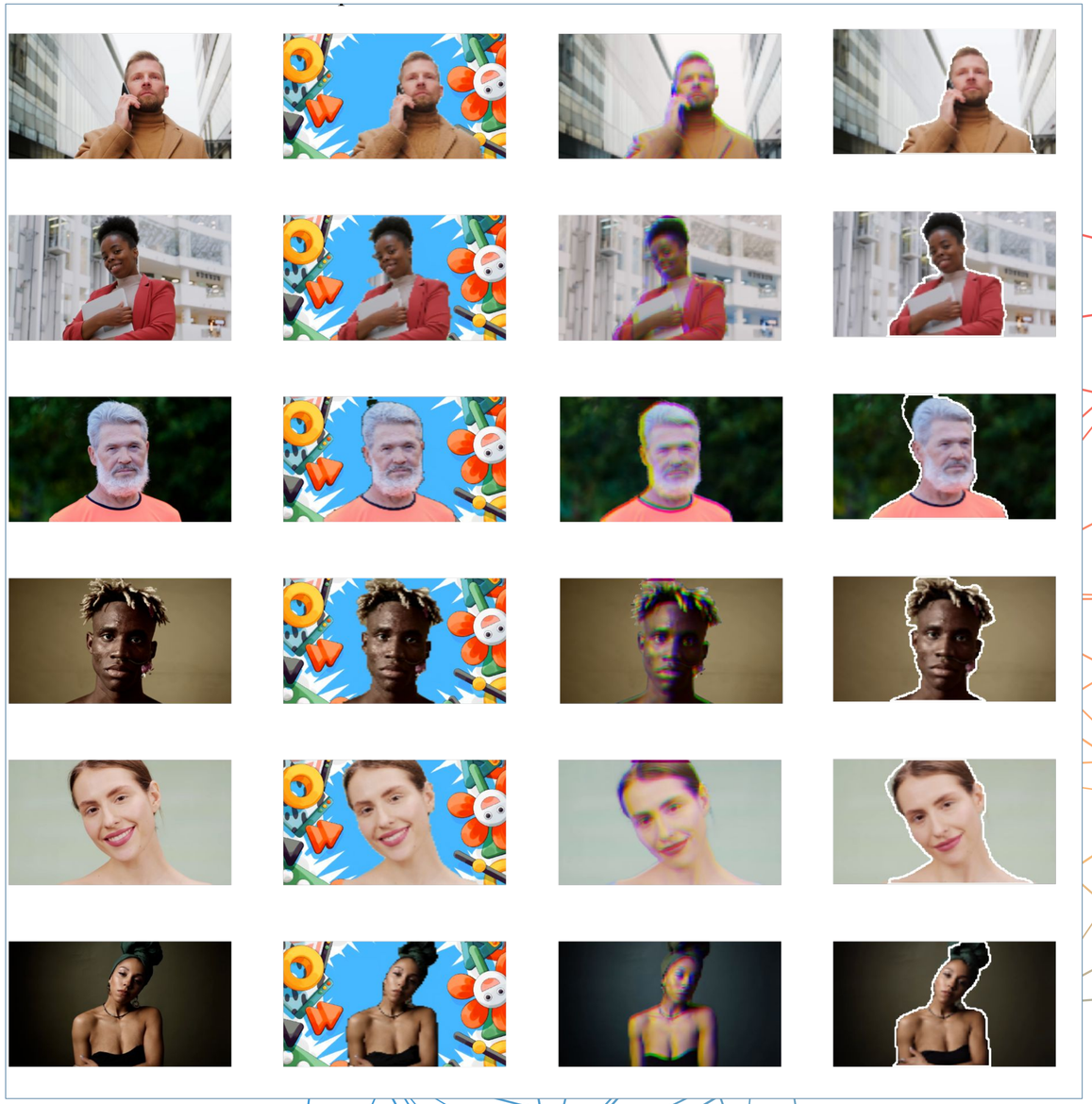
1st column - original image
2nd column - person segment
3rd column - ground truth image
4th column - person segment mask



6. Results

6.2 Effects on photos

1st column - original image
2nd column - background replacement
3rd column - RGB glitch
4th column - person outline



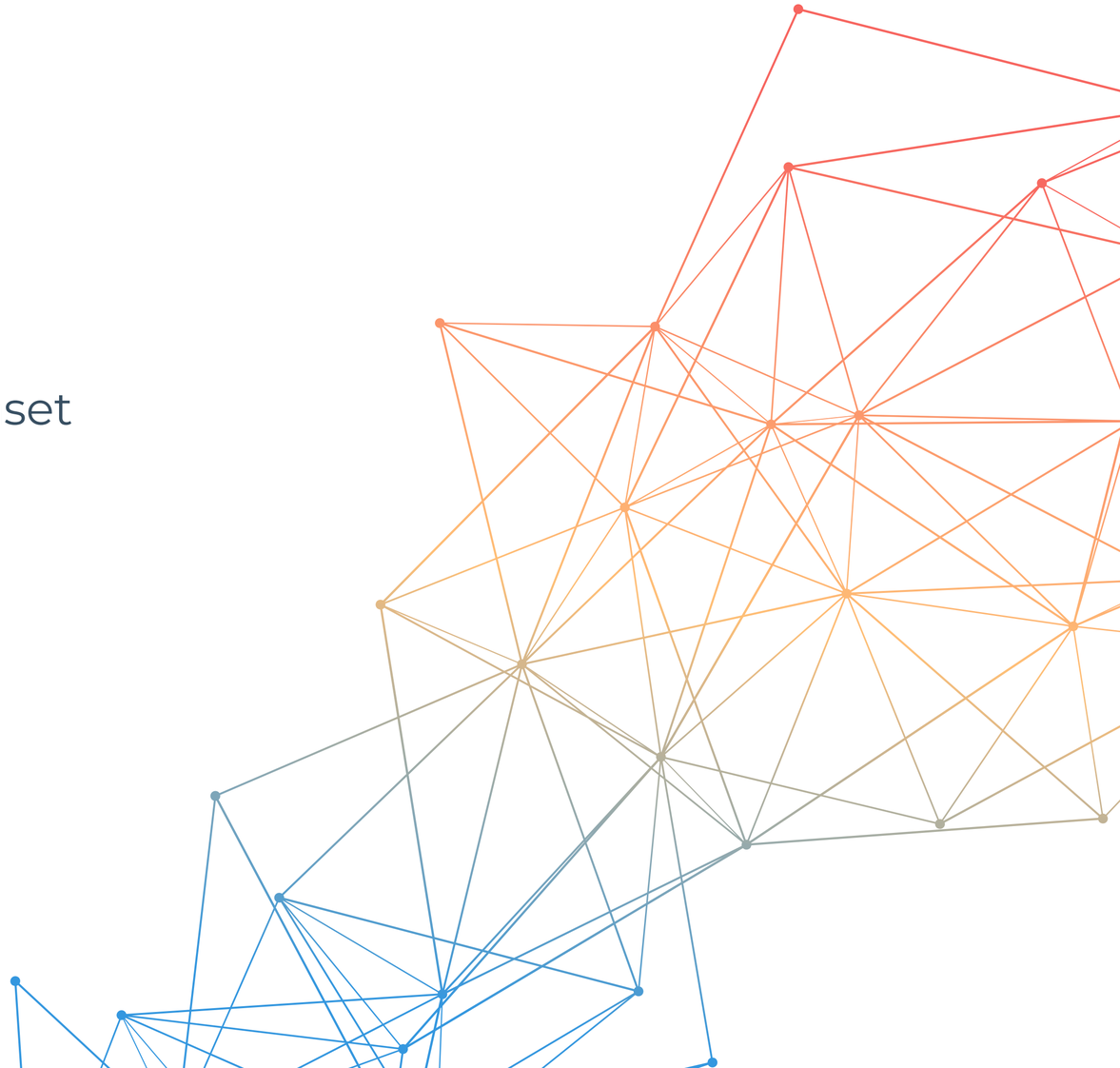
6. Results

6.3 Effects on video

7. Conclusion and further work

7.1 Suggestions

- **Training**-on a bigger resolution imagery
- Adding **full-body** images to training dataset
- Adding images with **multiple-people** to the dataset
- Adding imagery of people from **far away**



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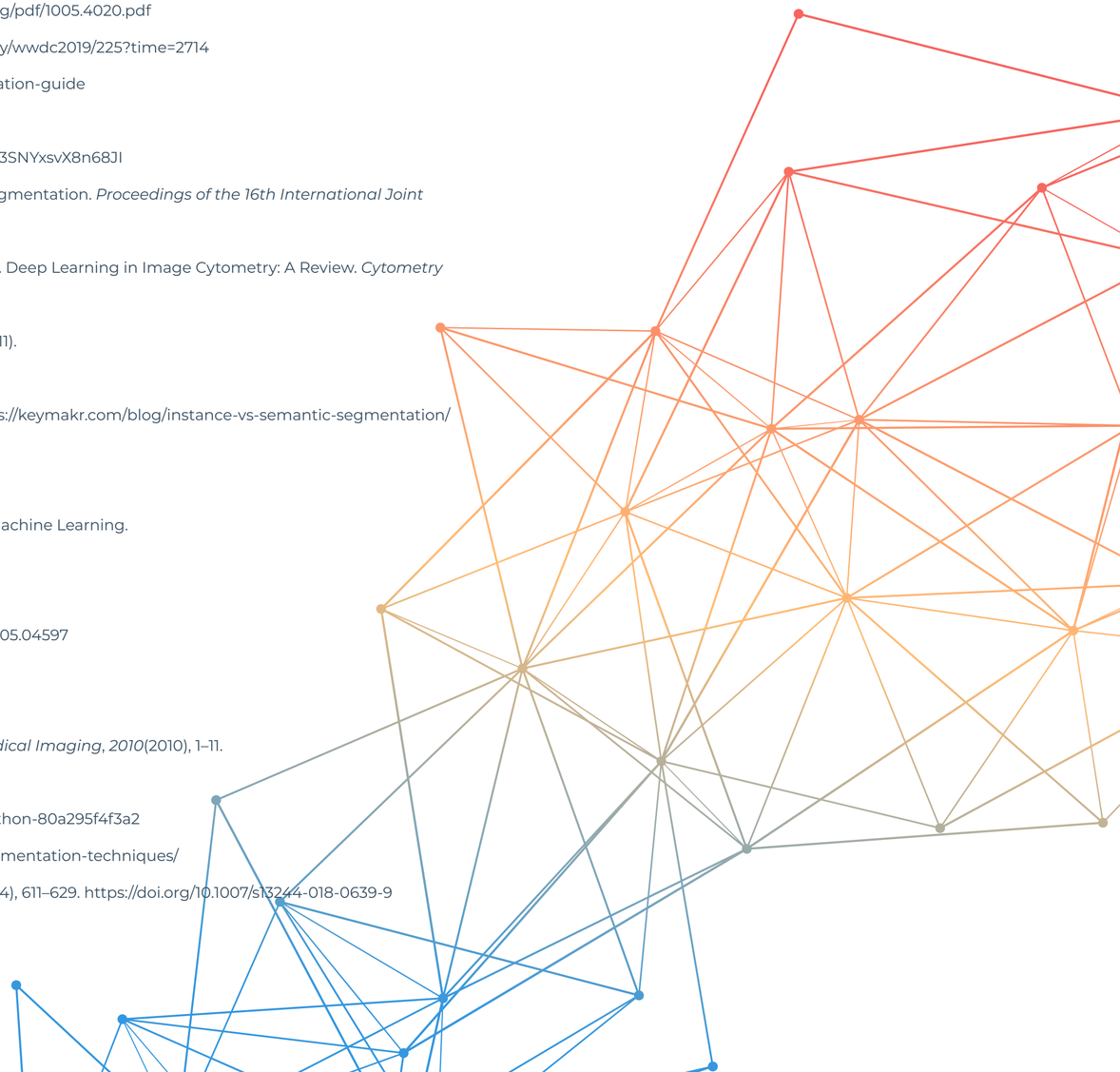

THANK YOU!