# Modeling the Importance of Faces In Natural Images

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Maria V. Ortiz Segovia[2], Sabine Süsstrunk[1]

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2. Océ

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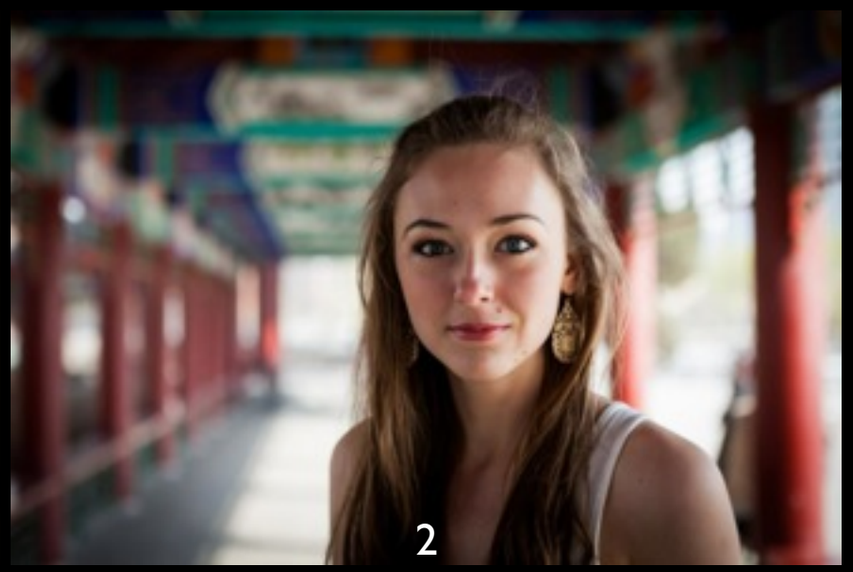
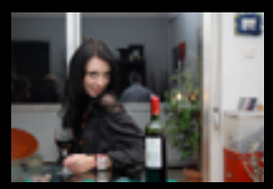
A CANON COMPANY

# Motivation



# Equal importance?



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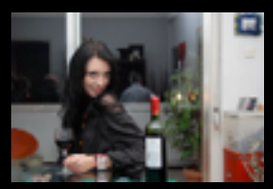

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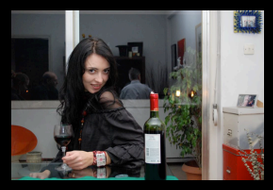

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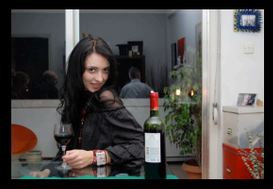

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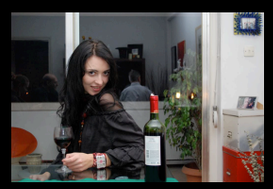
The importance of faces varies in different images!



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1. Rudoy, D., Goldman, D. B., Shechtman, E., and Zelnik-Manor, L., "Learning video saliency from human gaze using candidate selection," CVPR, 2013.
2. Marat, S., Guyader, N., and Pellerin, D., "Gaze prediction improvement by adding a face feature to a saliency model," Recent advances in signal processing , 2009.
3. Judd, T., Ehinger, K., Durand, F., and Torralba, A., "Learning to predict where humans look," ICCV, 2106–2113 (2009).

# Outline

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- Crowd-sourcing experiment

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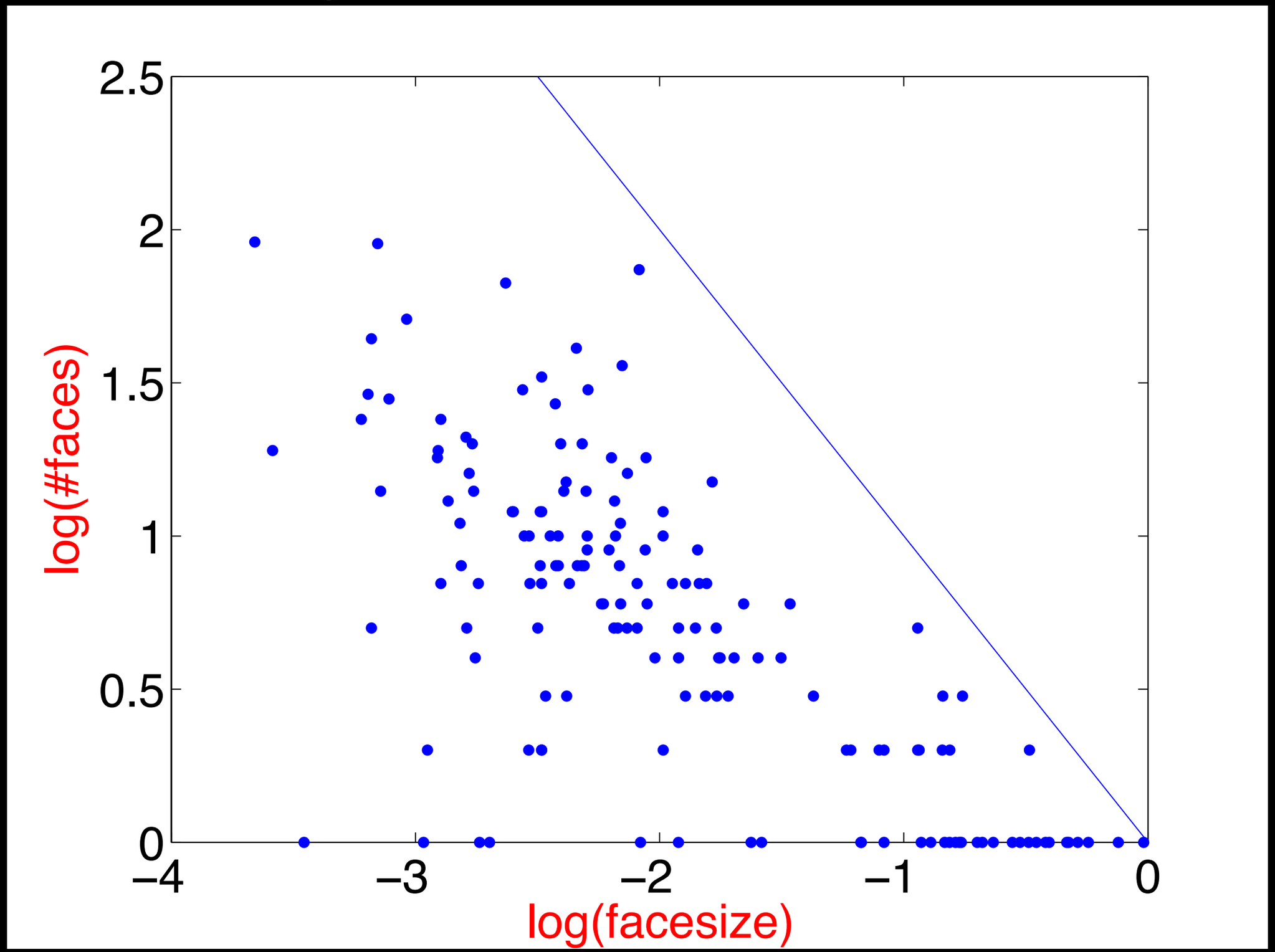
# Dataset

152 face images



# Crowd-sourcing experiment

**Reward:** 0.30
**Tasks Available:** 30
**Creation Date:** 2014-01-09 09:54:32
**Expiration Date:** 2014-01-19 09:54:32

BACK

**Description:** 50 images for T1
**Instructions:** For each image, label out the important parts in the image. It could be a face, or eyes or human bodies or even other objects. Draw rectangles on the area that you think is important. Hold left click and move your mouse to draw rectangles.

## Label out the important parts of the image

1. Go to website http://ivrgwww.epfl.ch/~bjin/forsaliency/Task1/labelimages_intro.html;
2. Read the discription. Then click on CreateUser button and enter a user name.Start labelling images.
3. You will be shown 50 images with each at a time. Label out the important objects in the image by drawing rectangles.

2. Write your username in below and I will check your results and then pay you:

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BACK

~ 30 observers per image

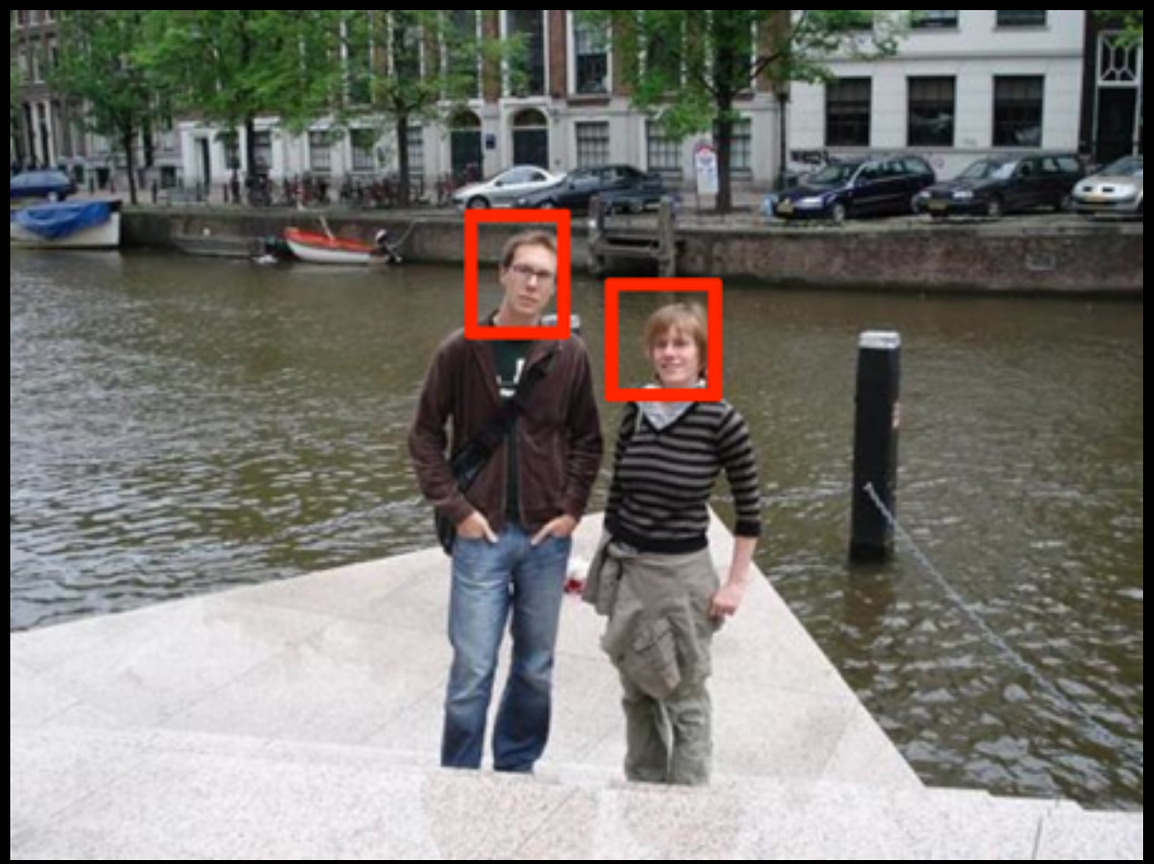
# Crowd-sourcing experiment

Label out the important objects in the image

Label out the important objects in the image by drawing rectangles. Draw a rectangle on each important objects. Hold left click and move your mouse to draw rectangles. Press key z to delete the last rectangle you draw. Click on next image to go to next image.

next image

# Crowd-sourcing results



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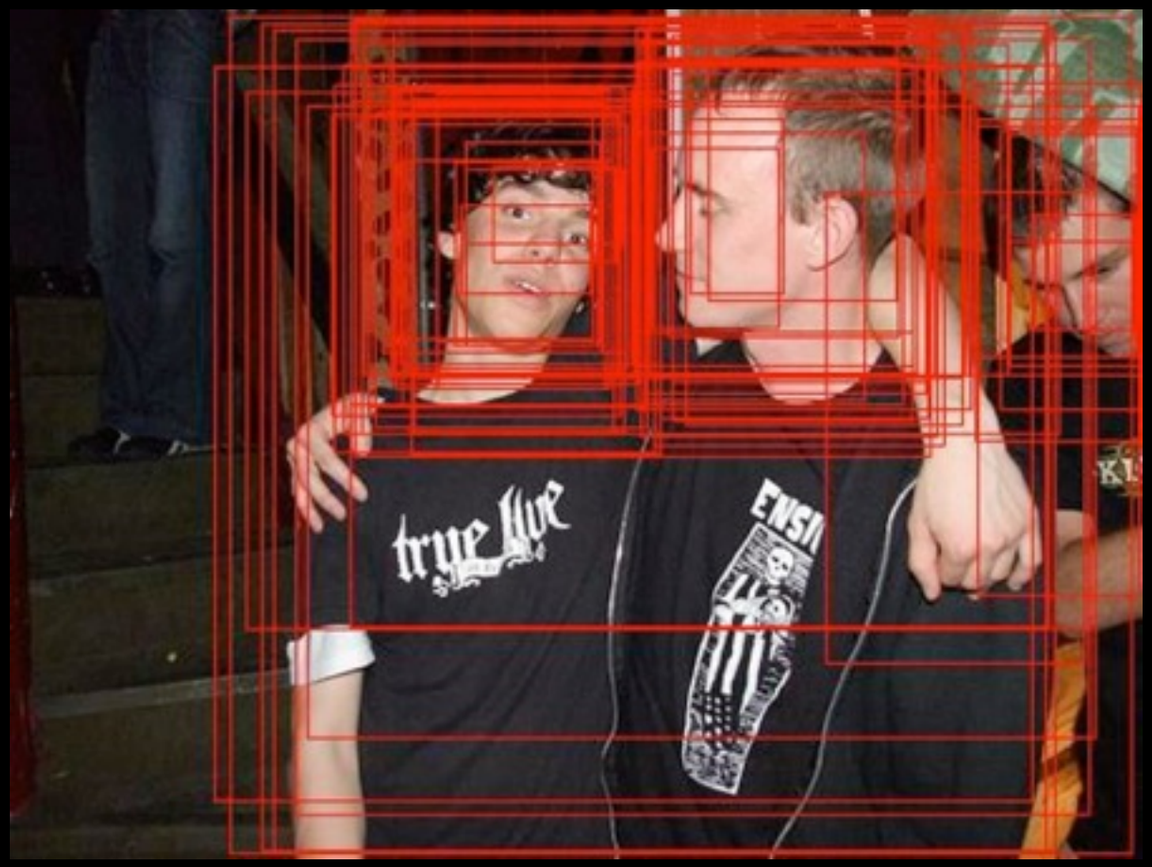

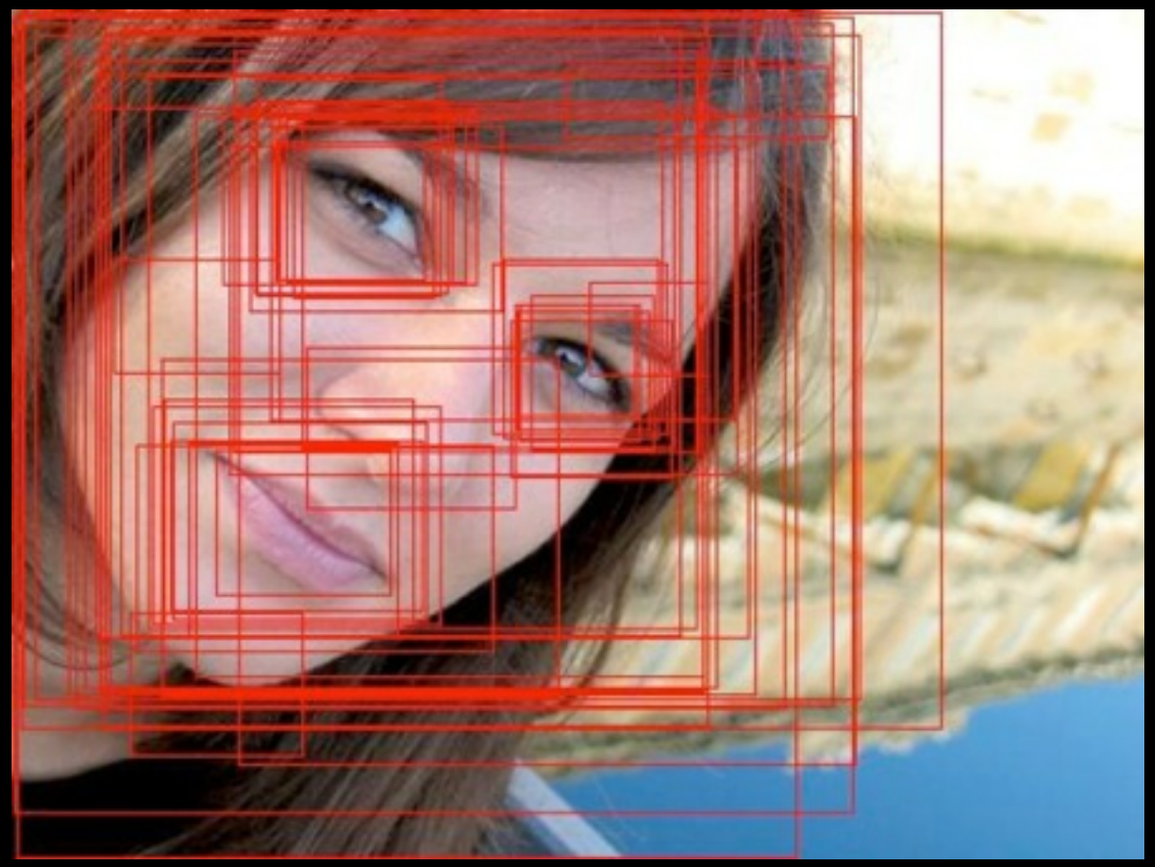

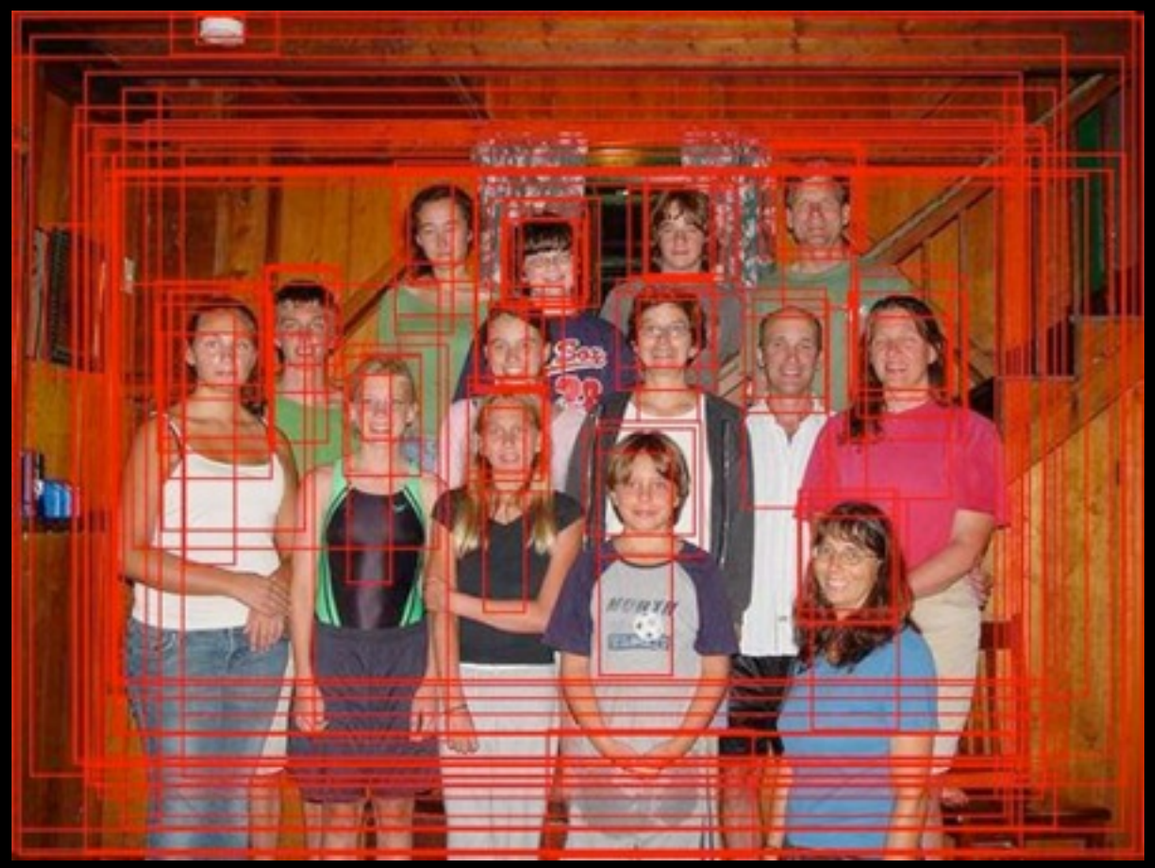

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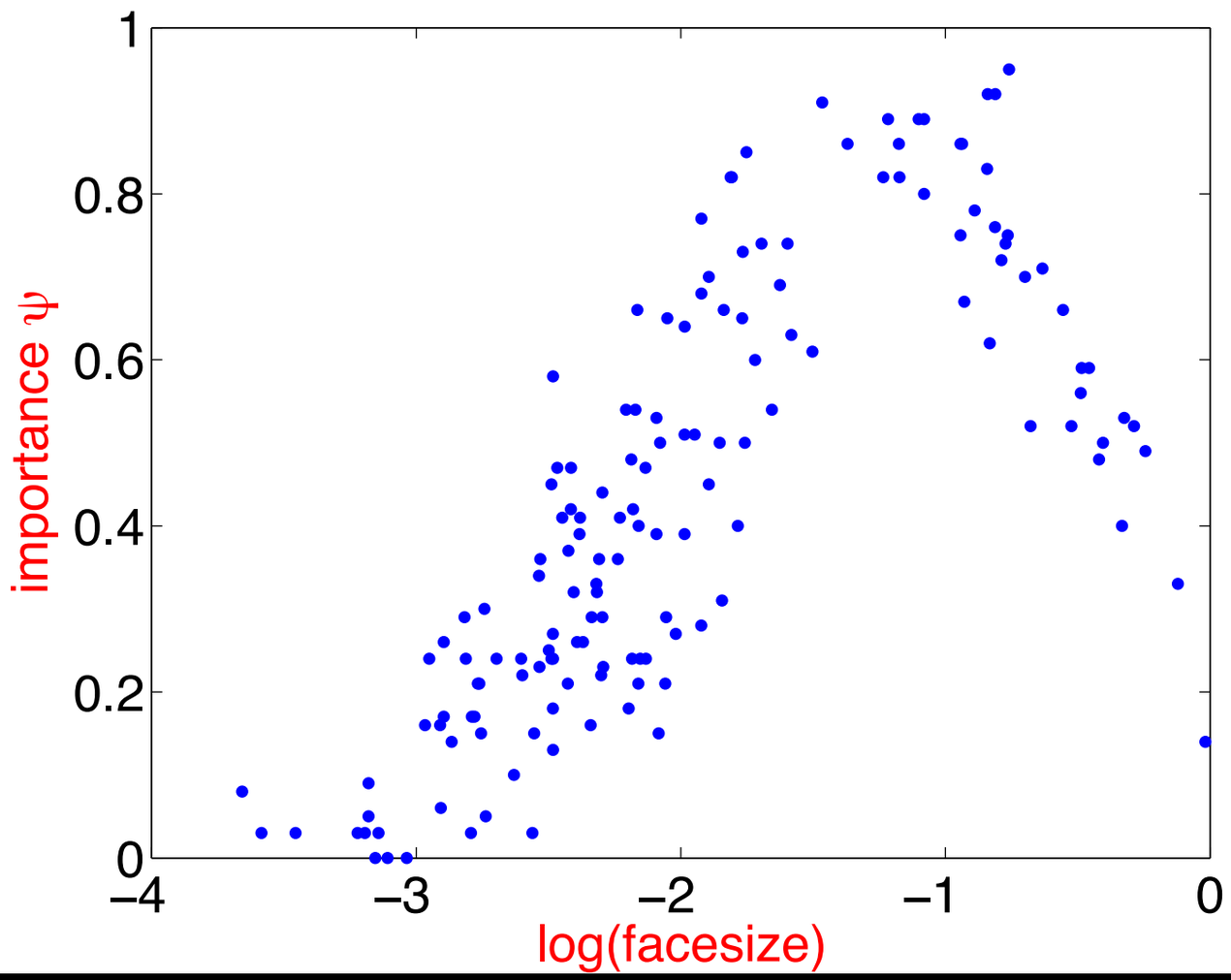
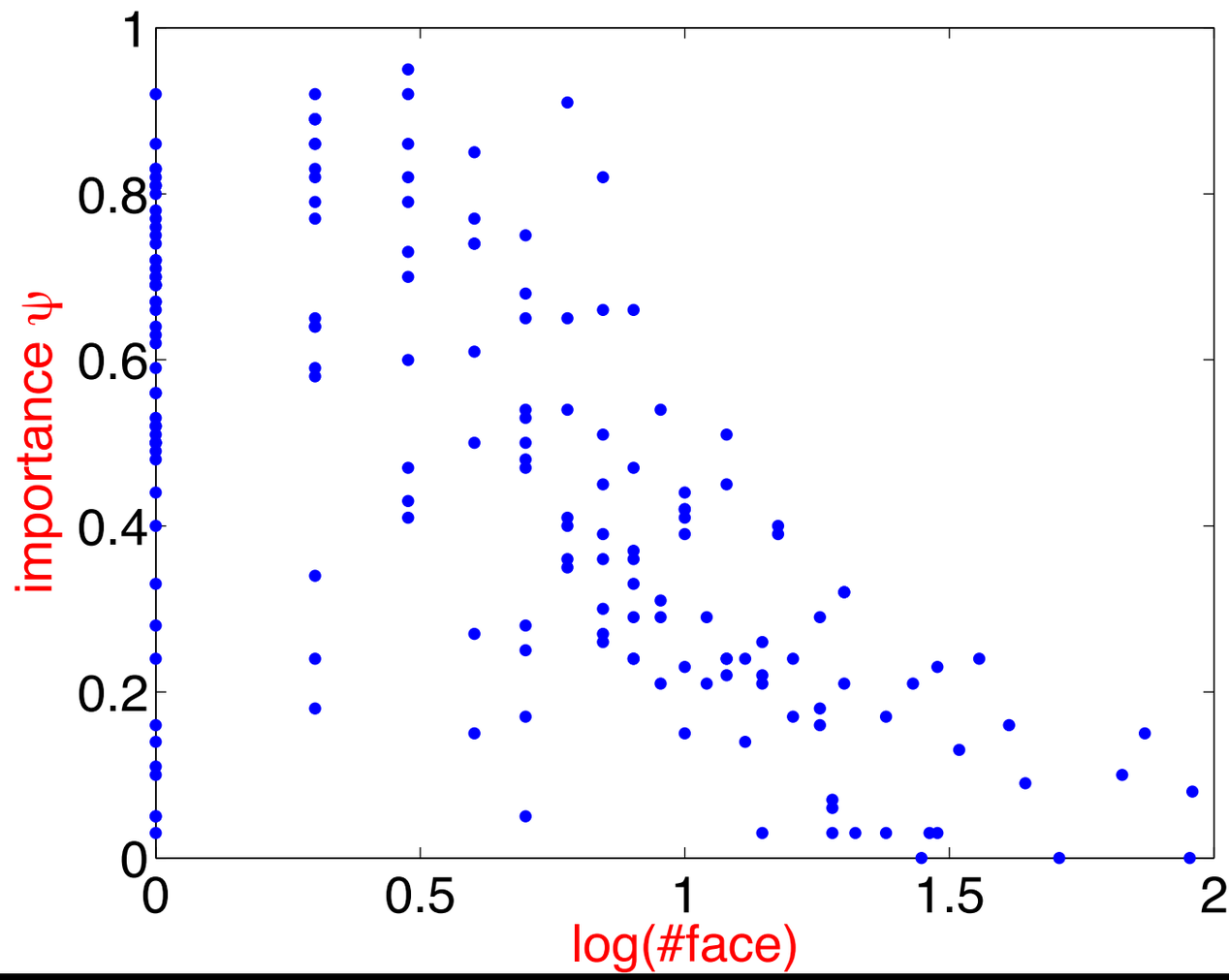
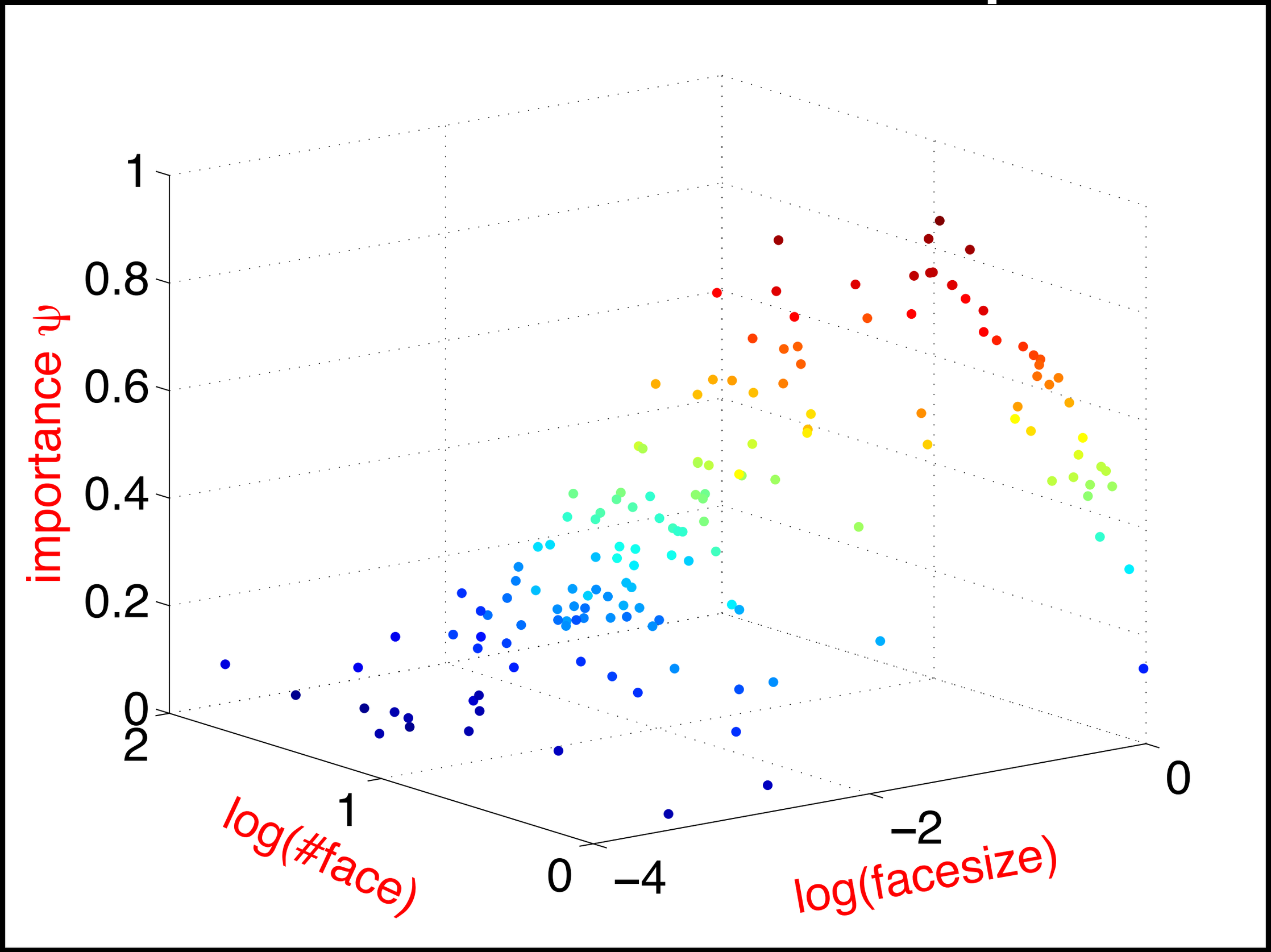
- Conclusion

# 1D distribution of face importance

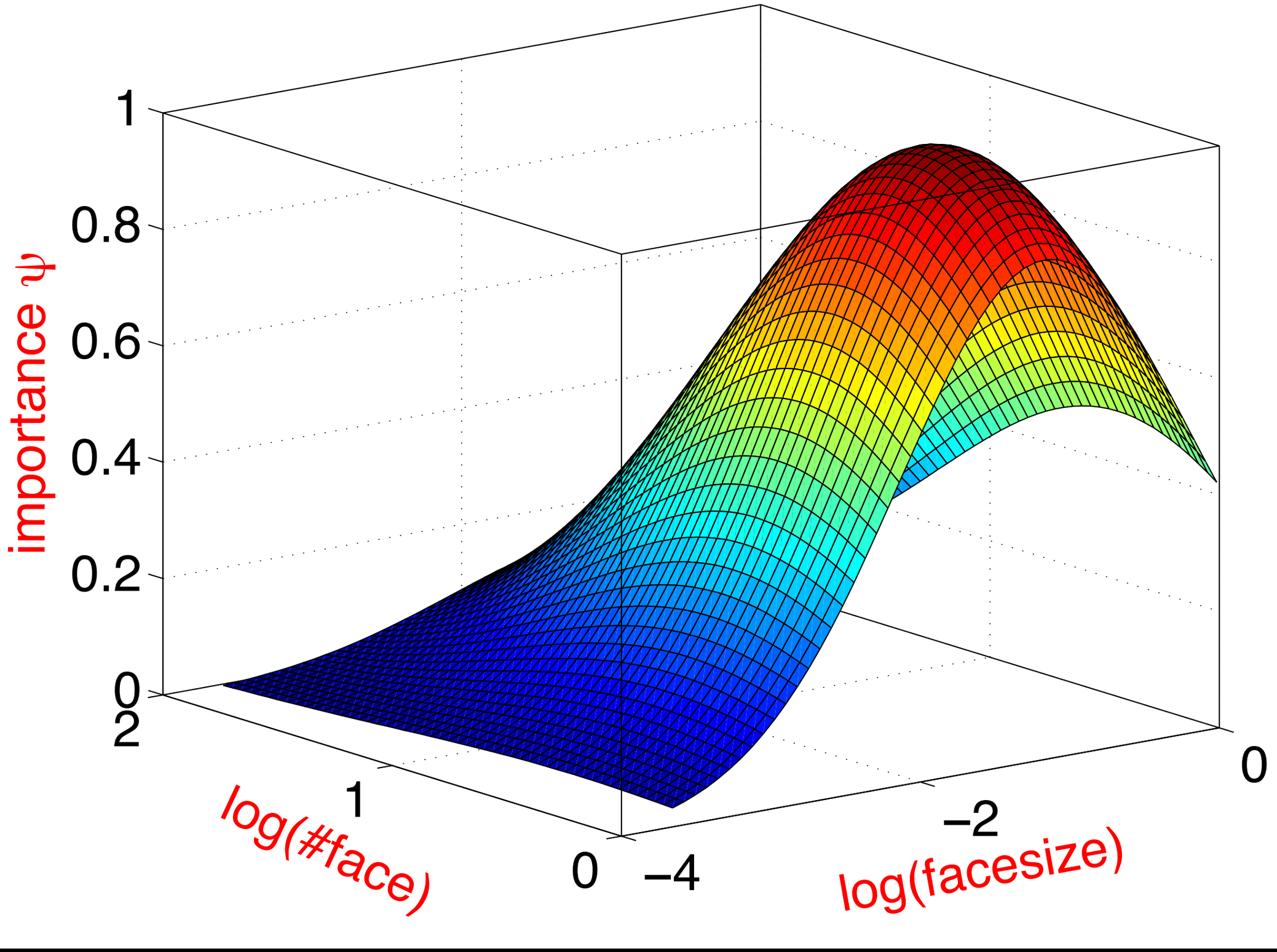


# Joint distribution of face importance



# Face importance model



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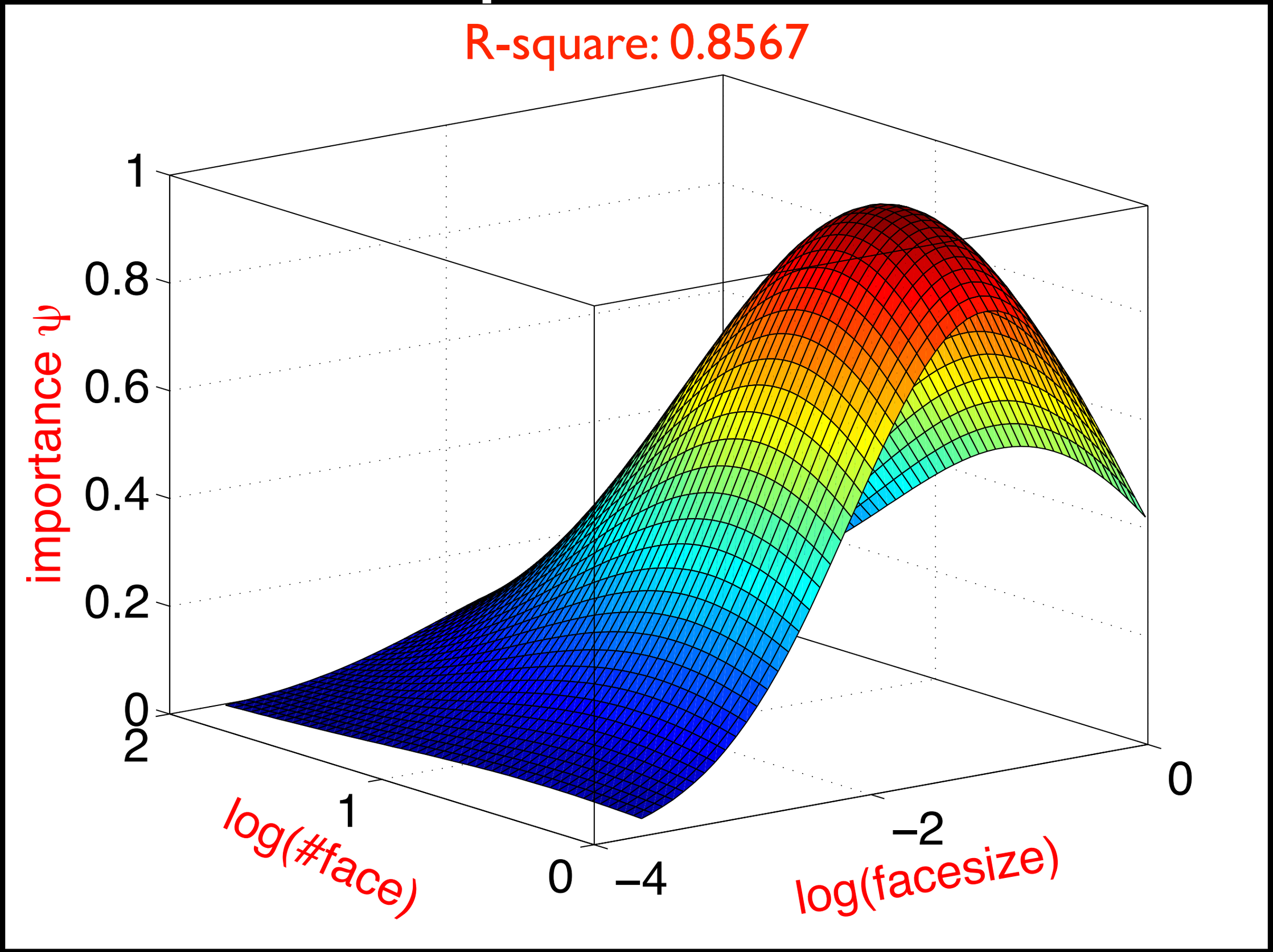
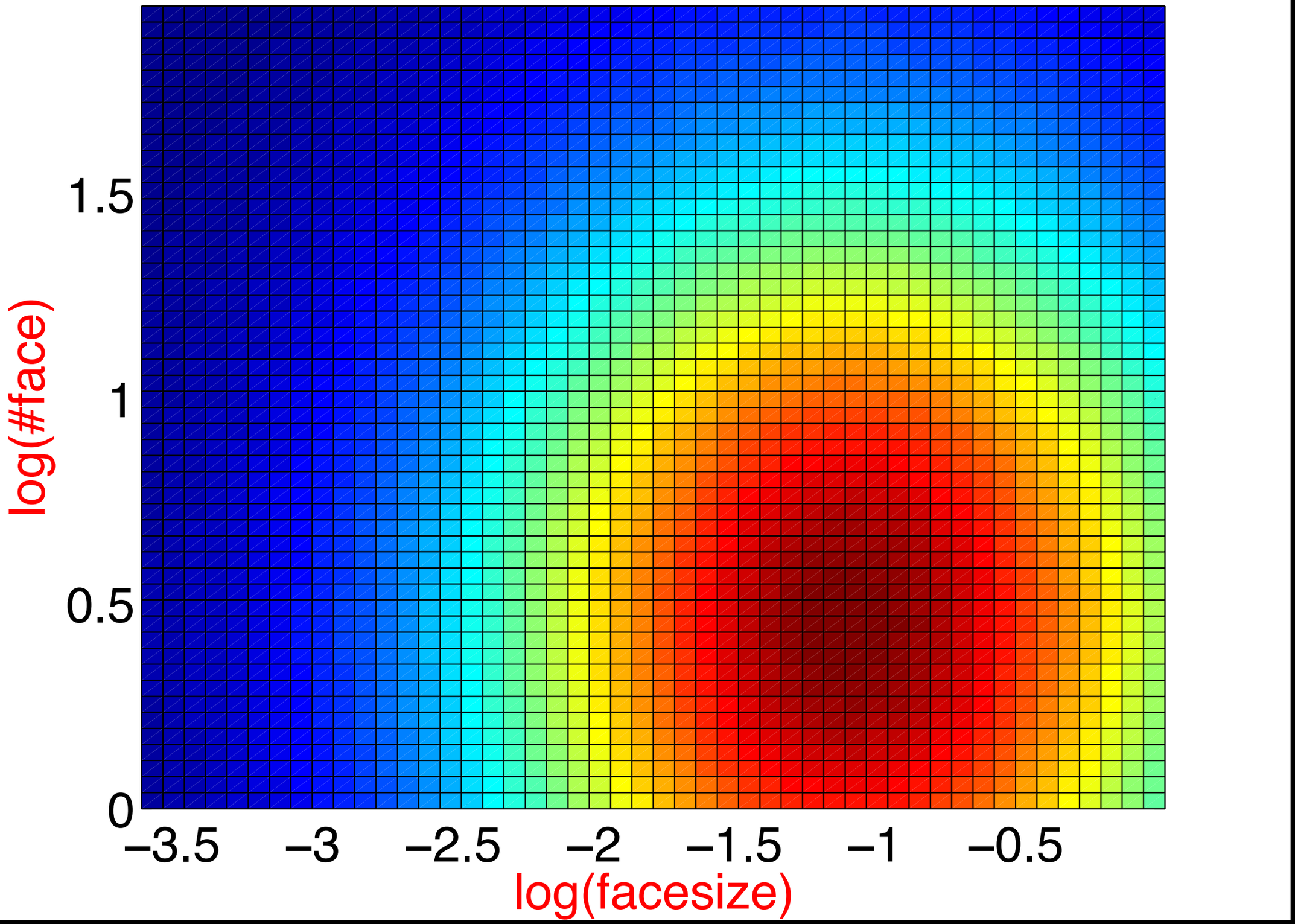


# Heatmap



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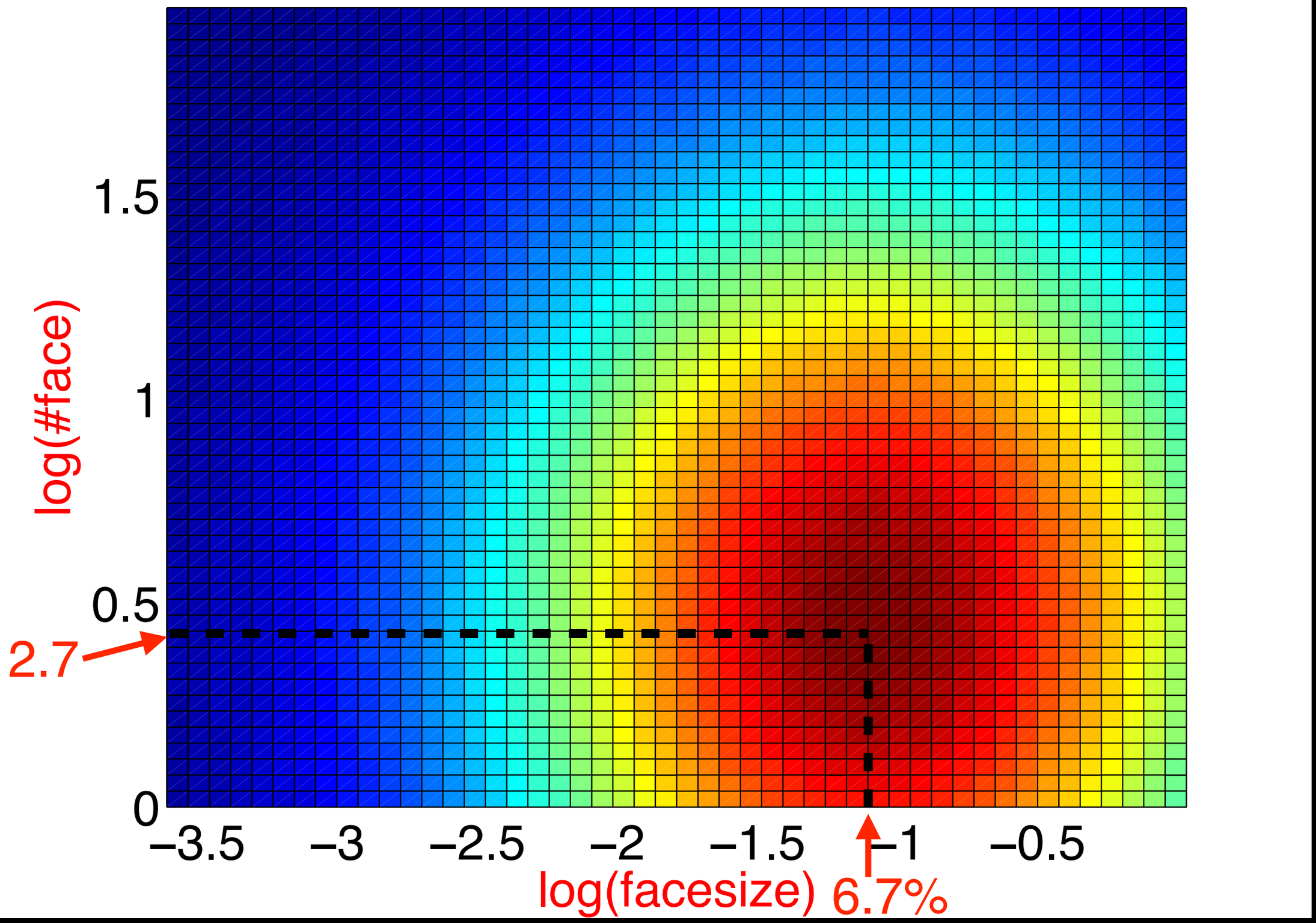

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# Salient-object detection

original image

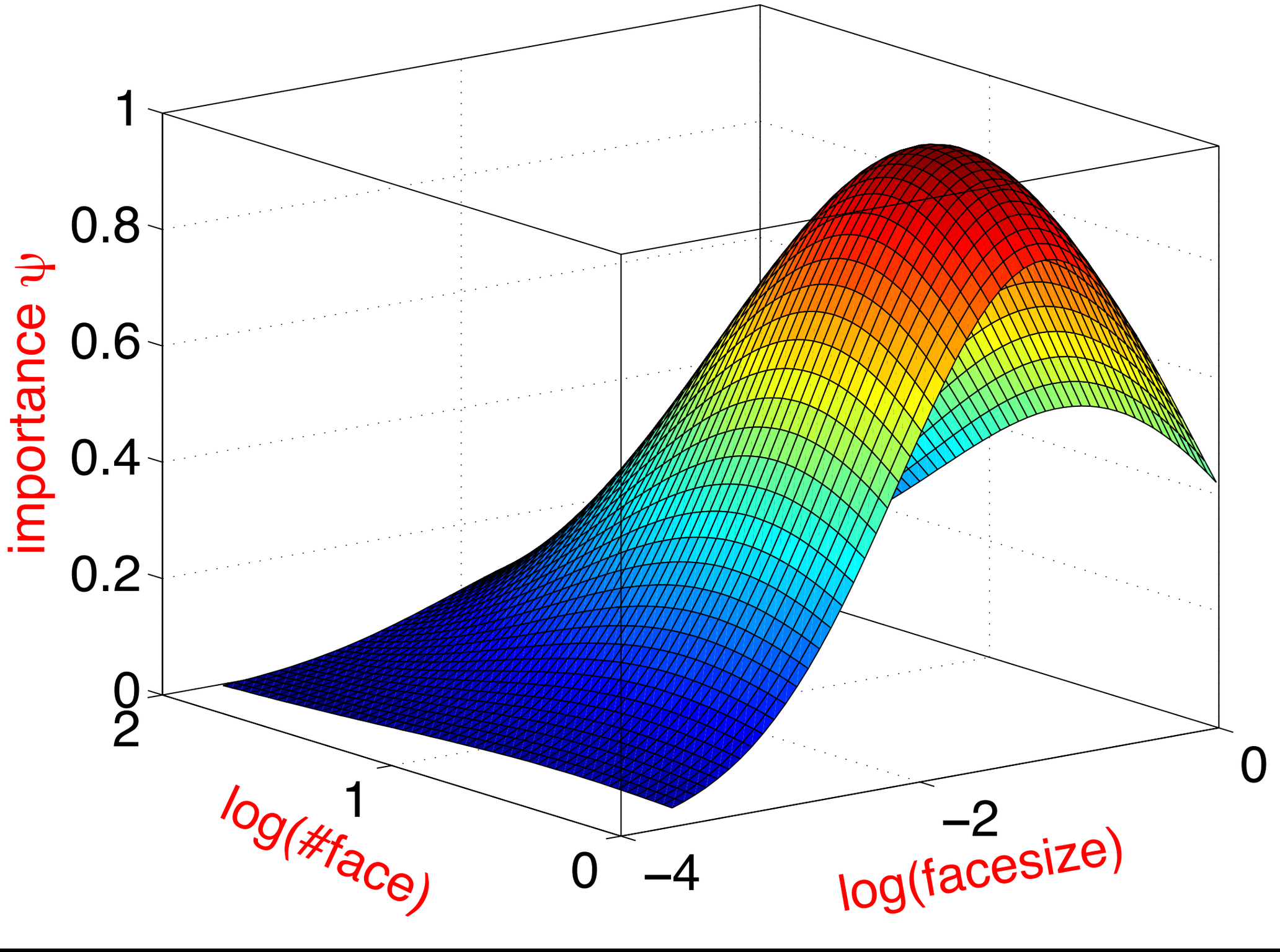
saliency map

# Saliency algorithm

# Saliency algorithm

input

# Saliency algorithm



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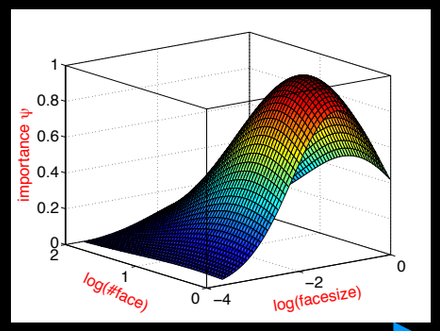

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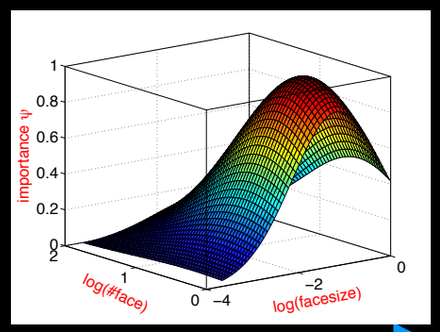

face-importance map

input

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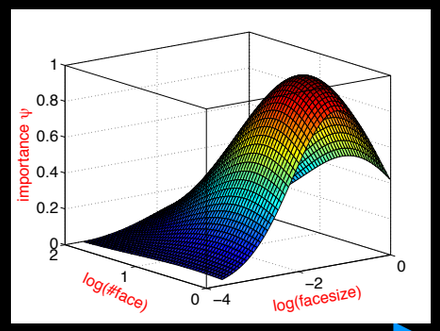
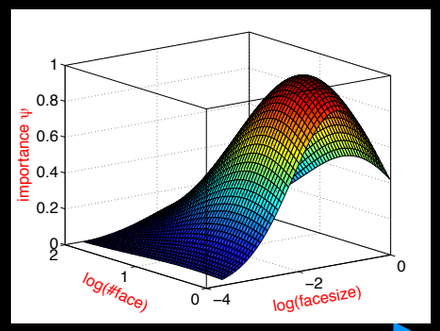


face-importance map

input

contrast-based
saliency map

# Saliency algorithm



face-importance map

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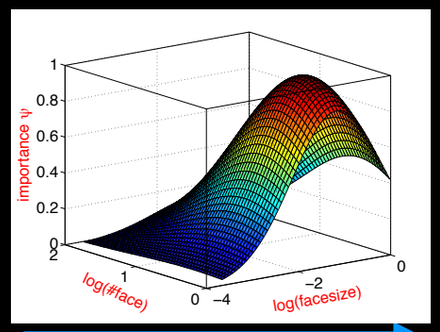

face-importance map

input

contrast-based
saliency map

final saliency map

# Face importance map

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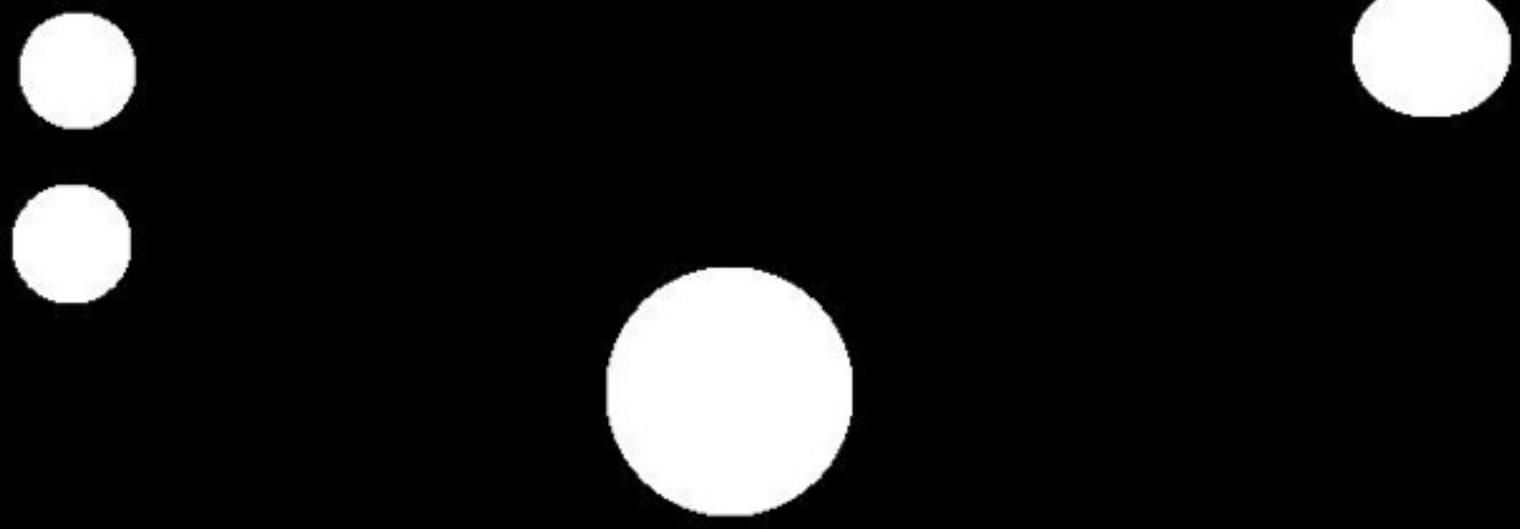

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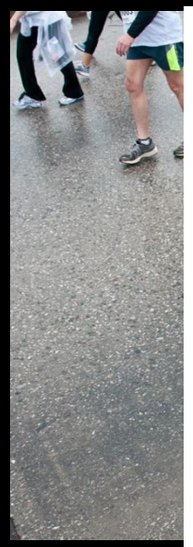

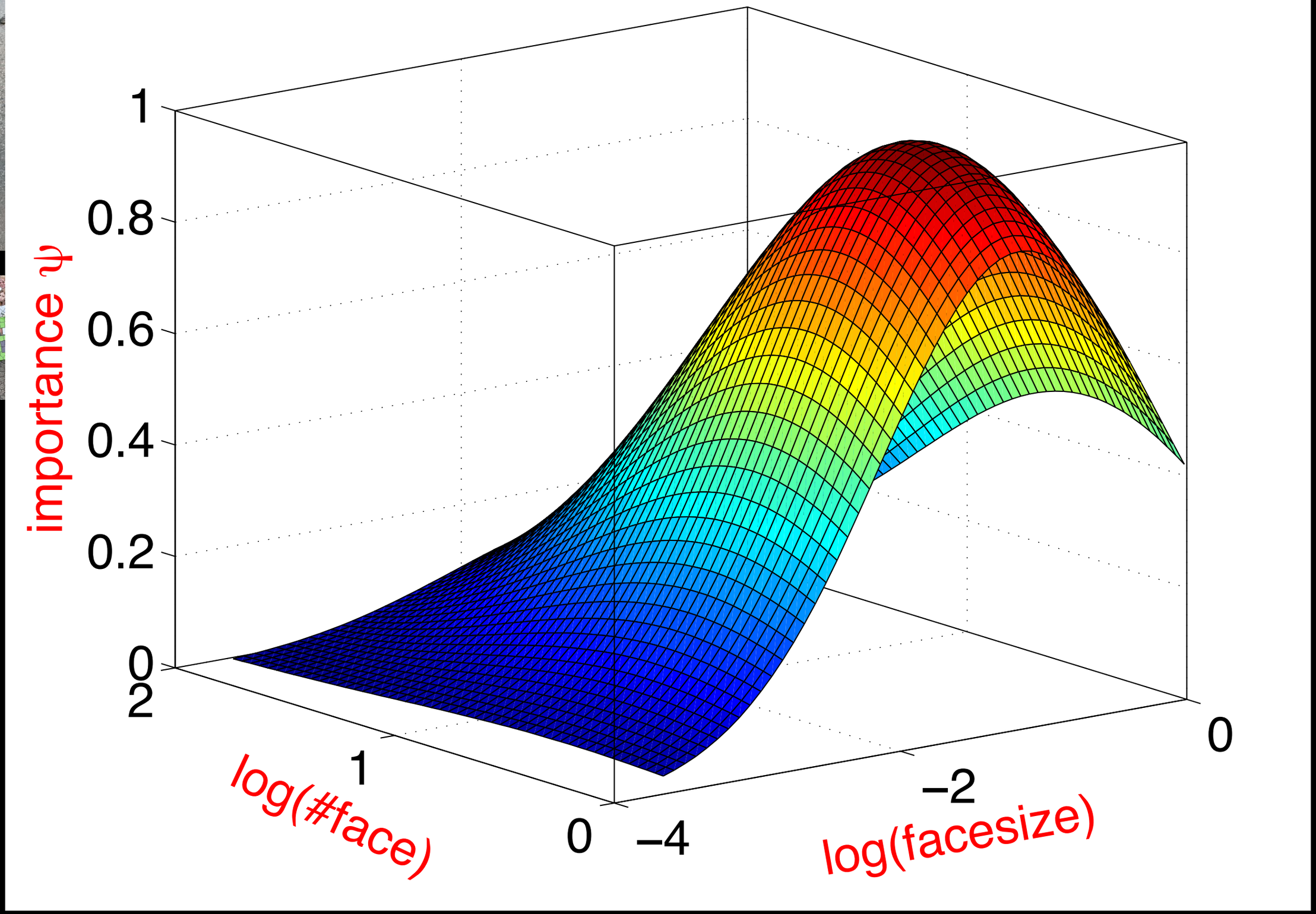

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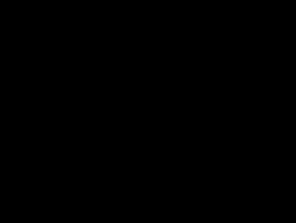

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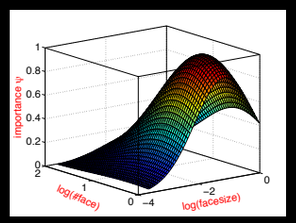


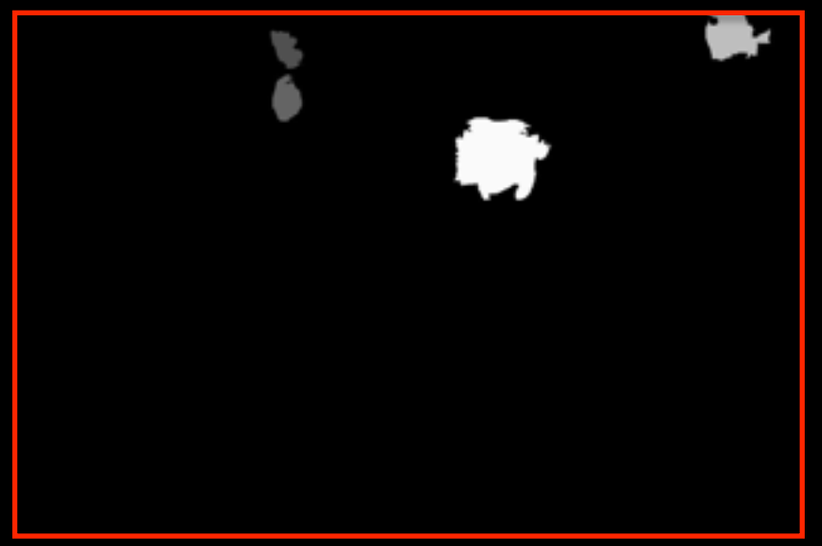

# Contrast-based saliency map

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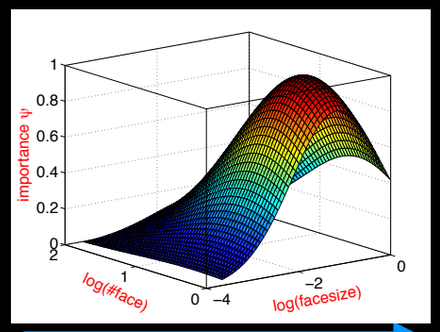
# Combination



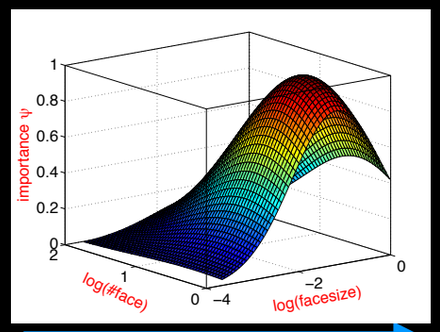
face-importance map

input

contrast-based
saliency map

final saliency map

# Combination



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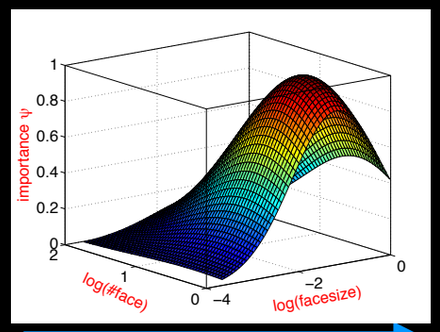

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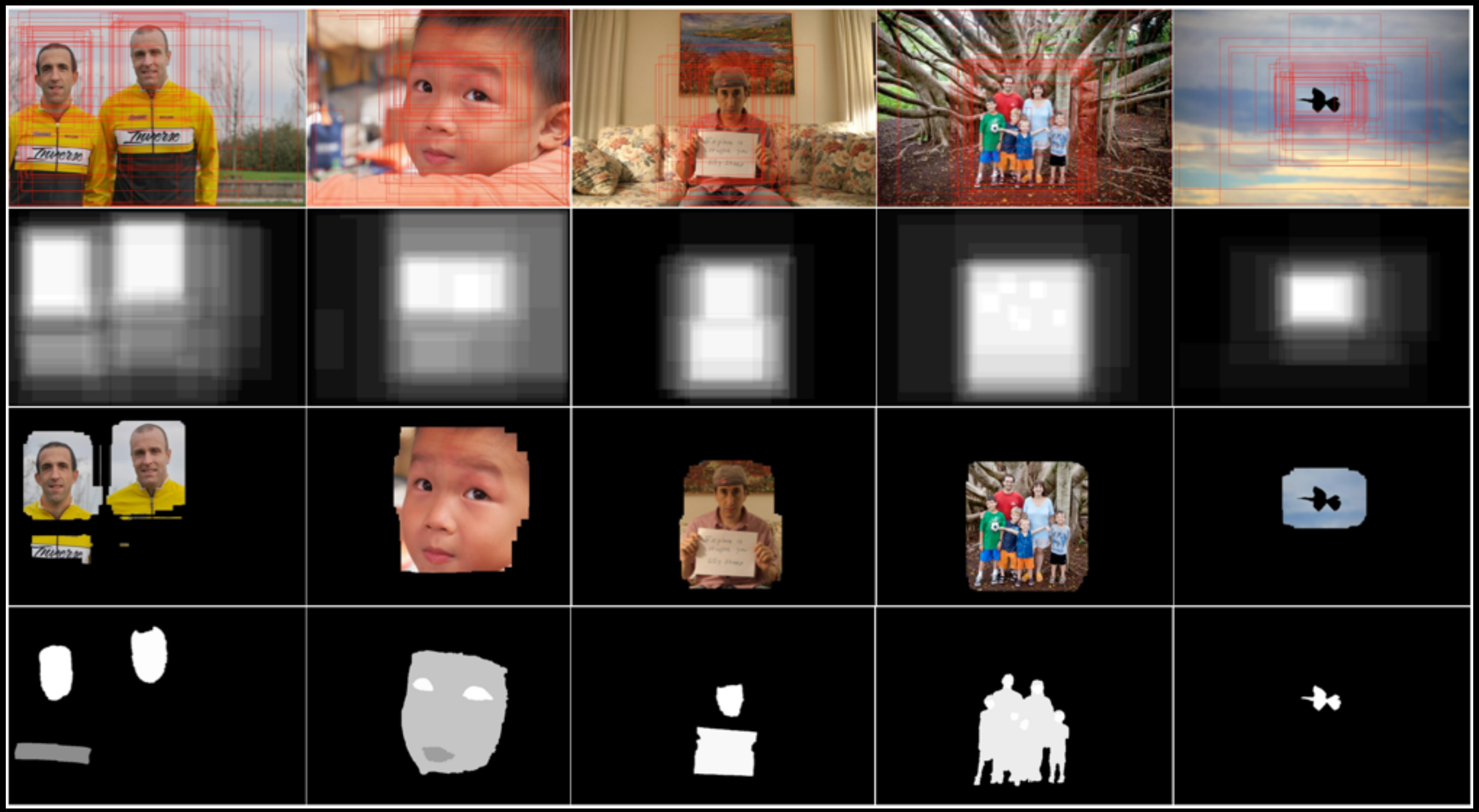
# Evaluation dataset

# Evaluation dataset

# Ground-truth



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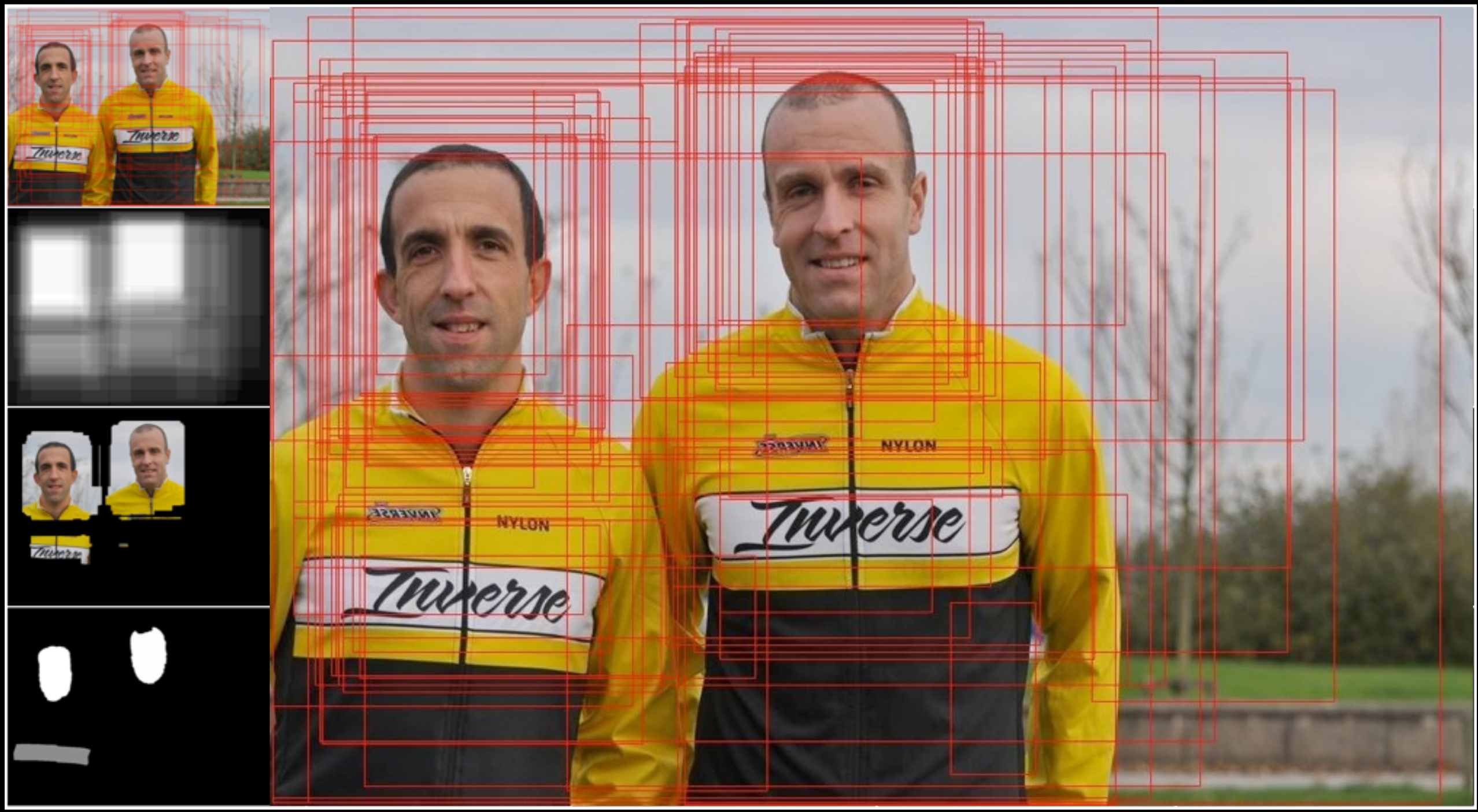

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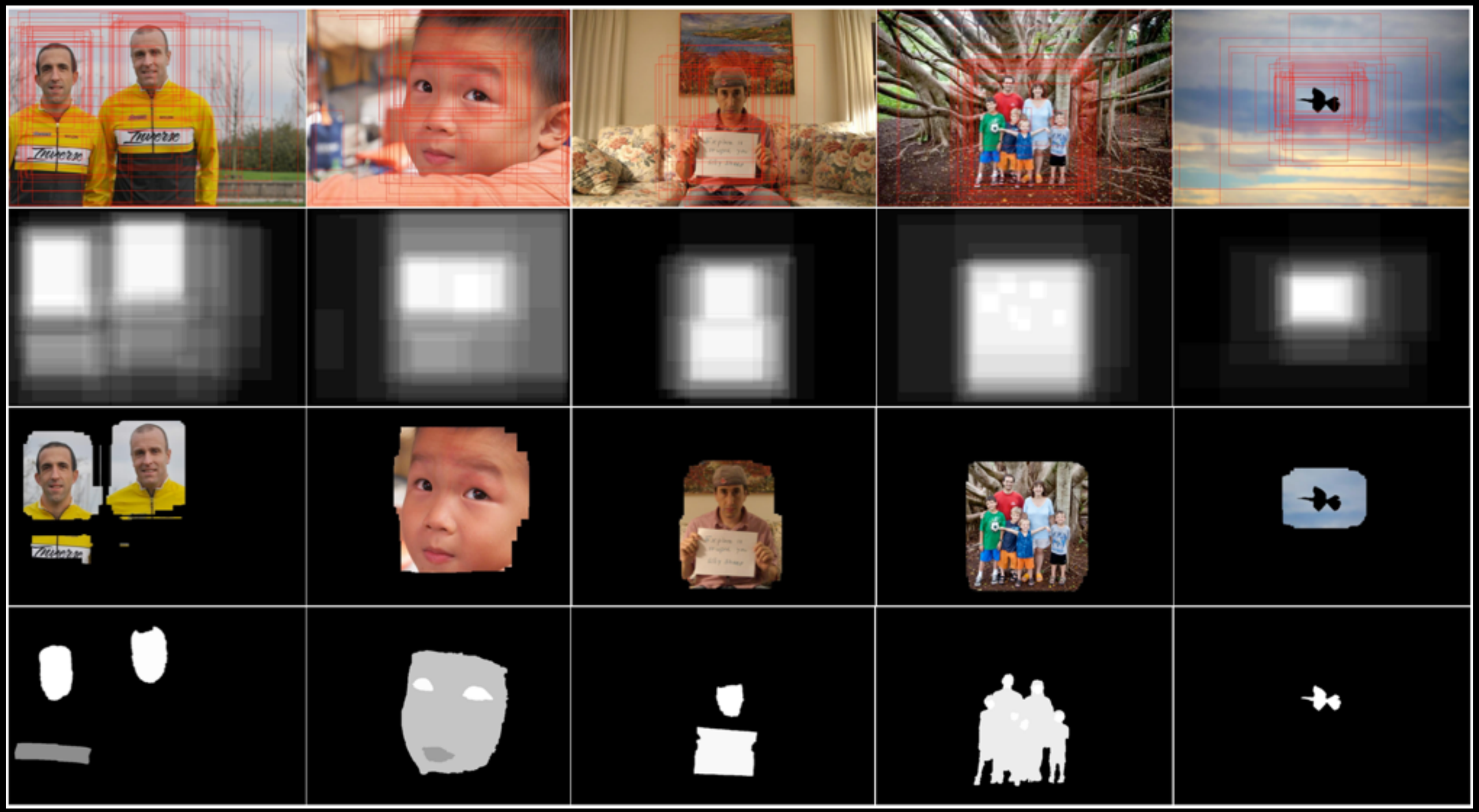

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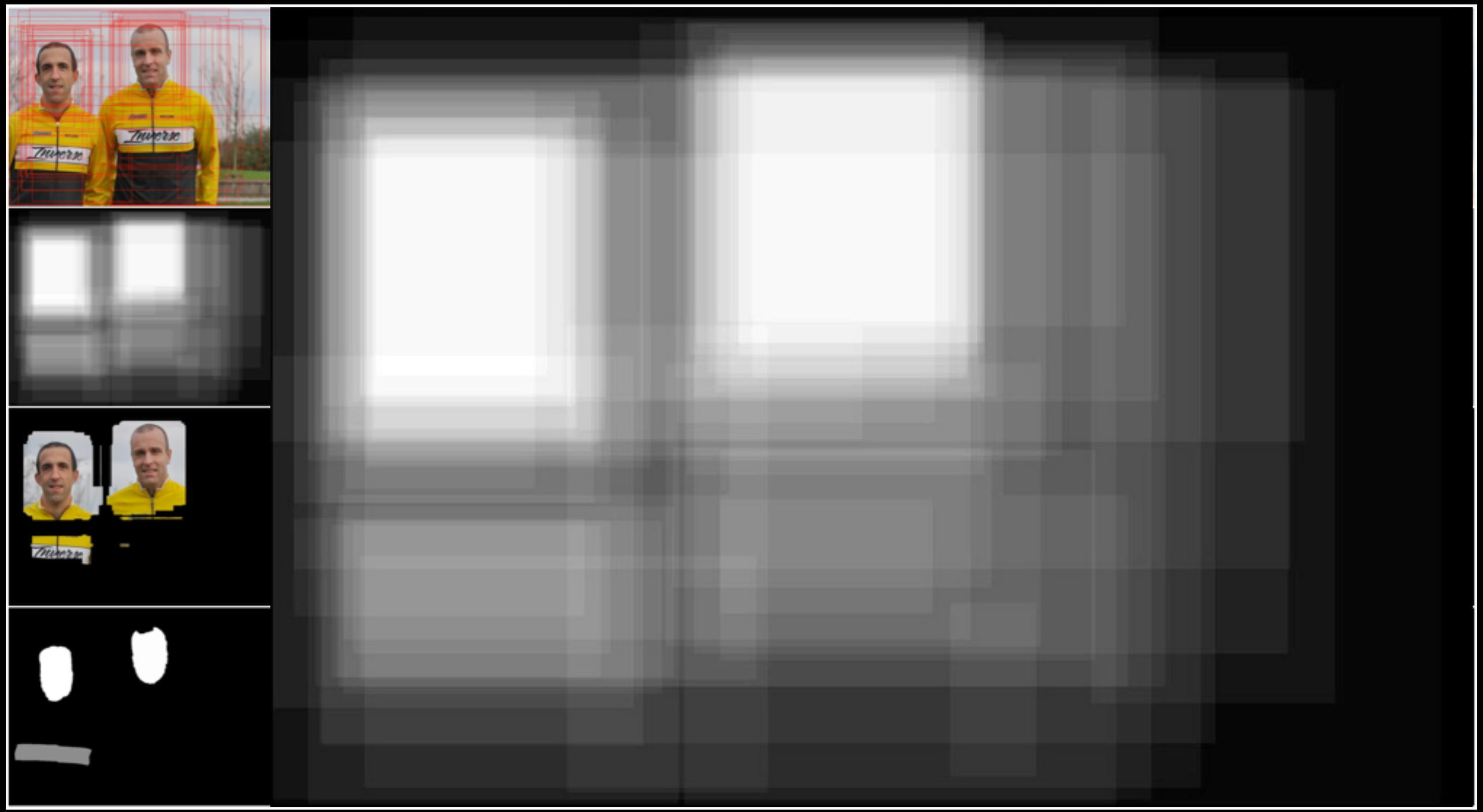

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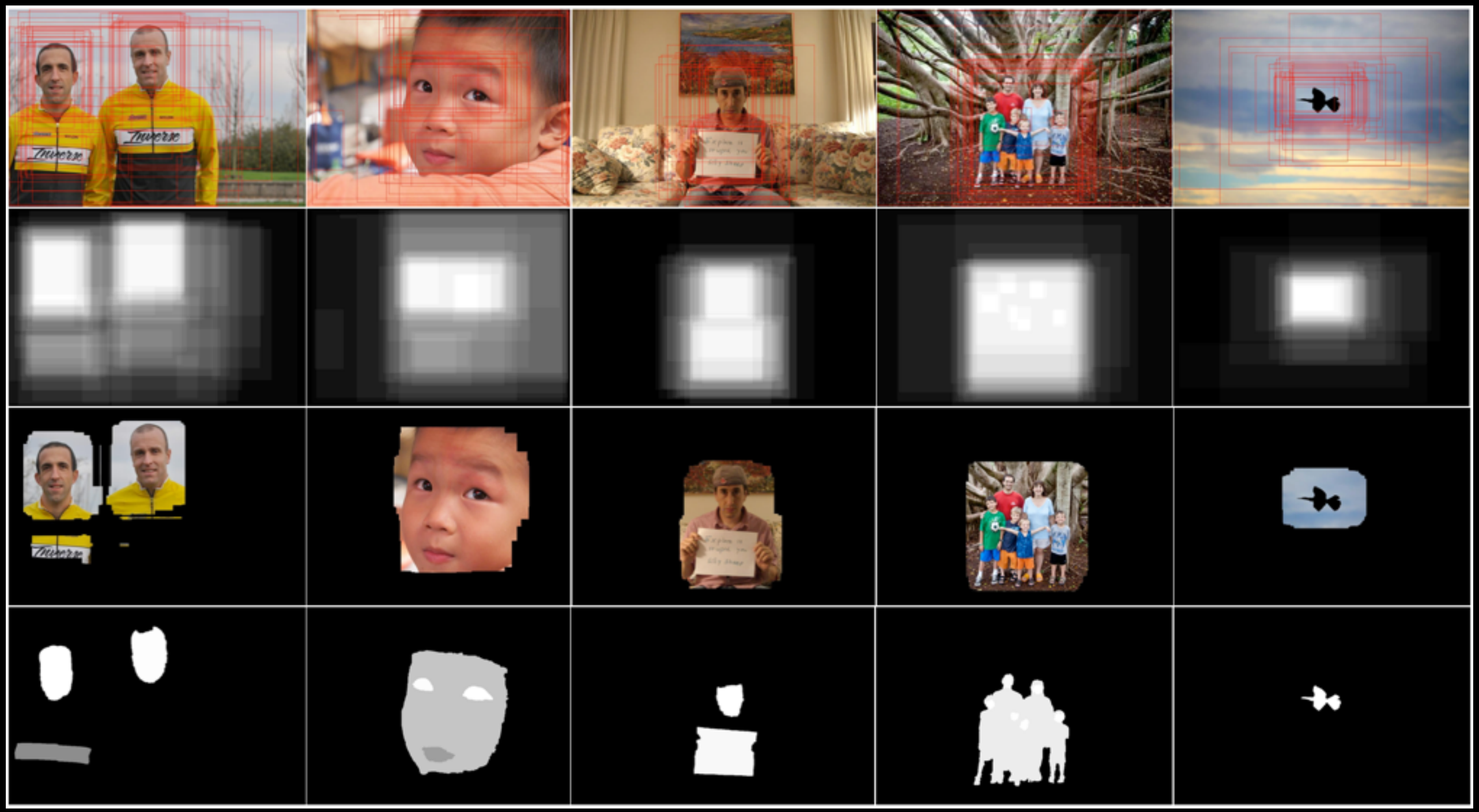

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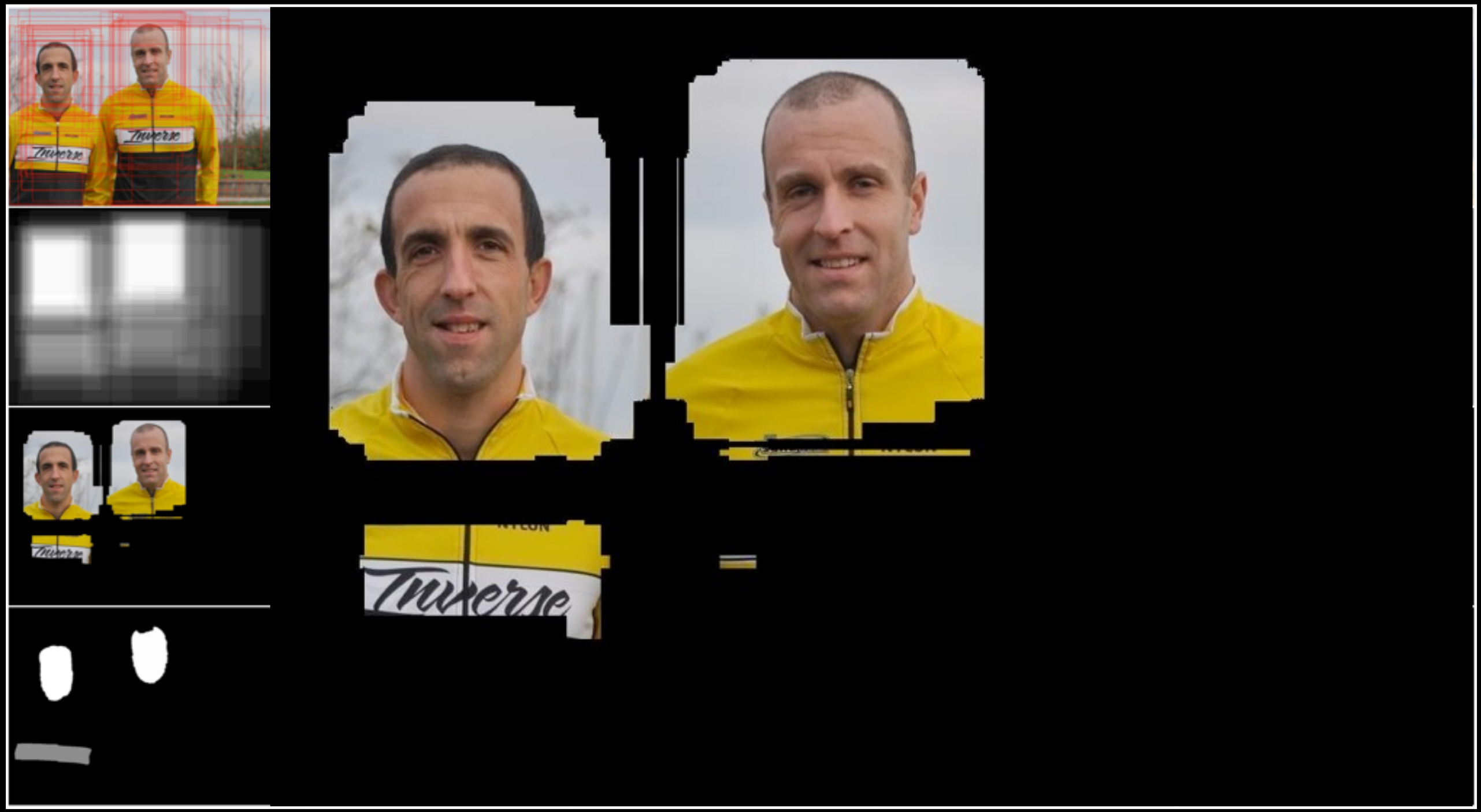

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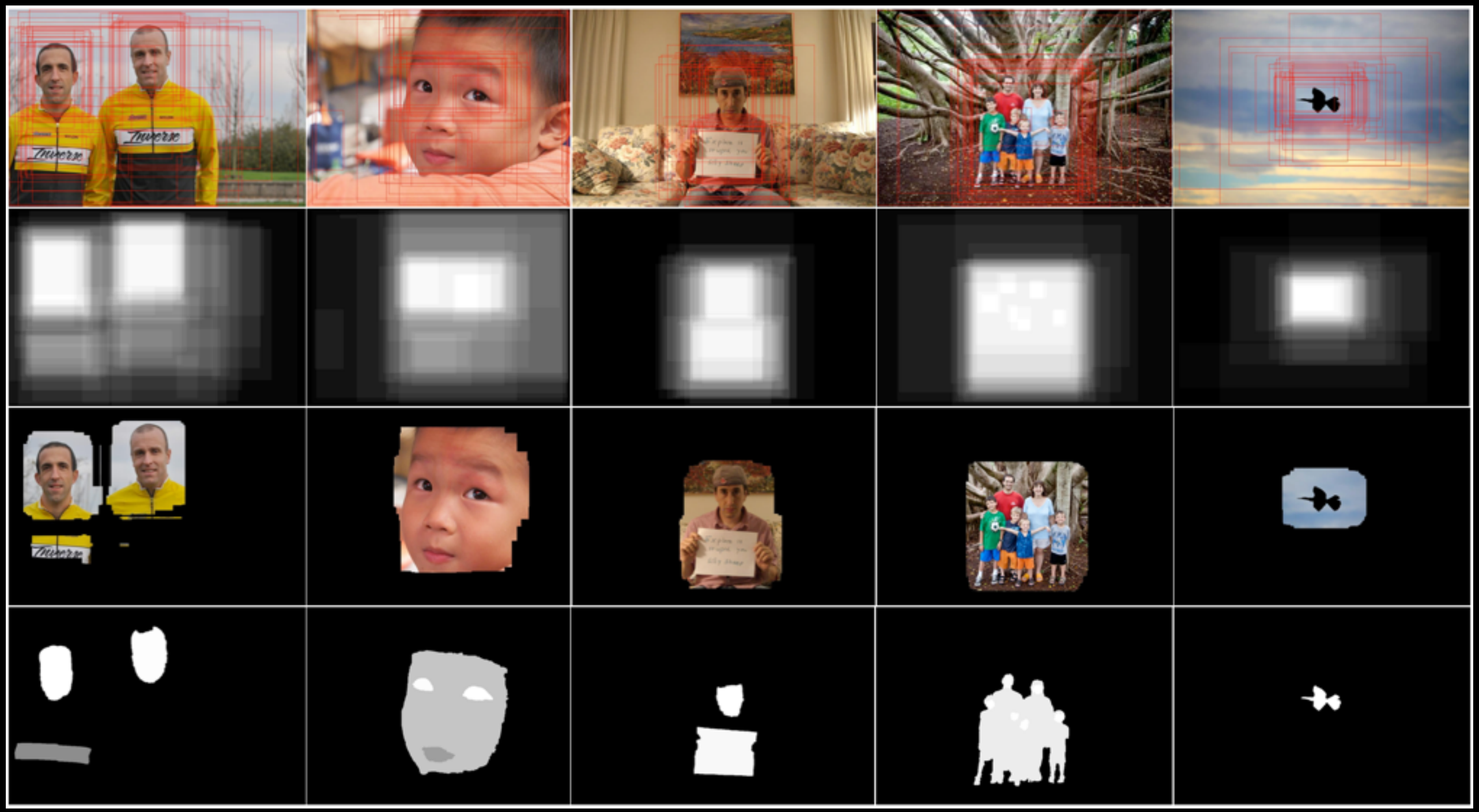

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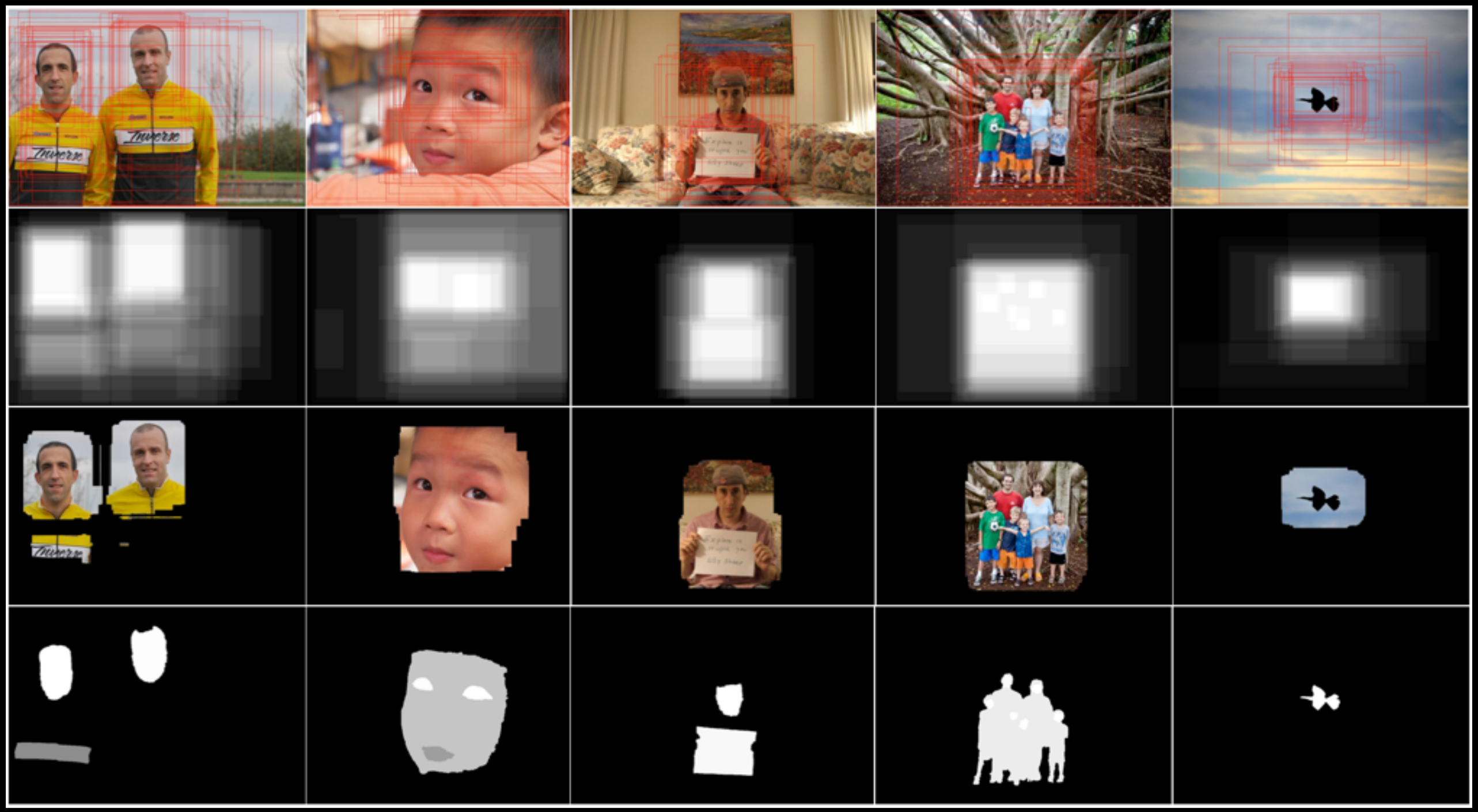
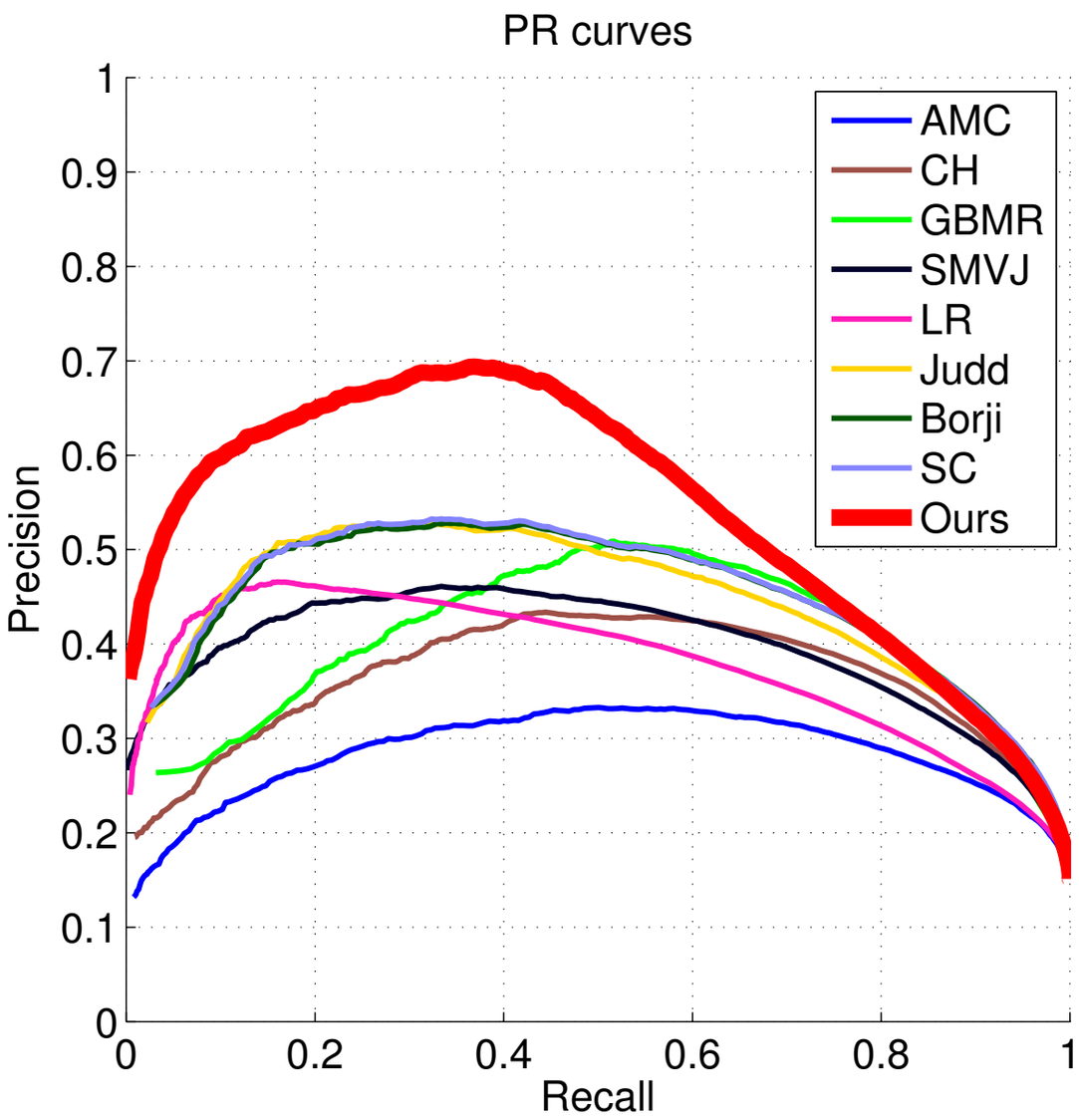
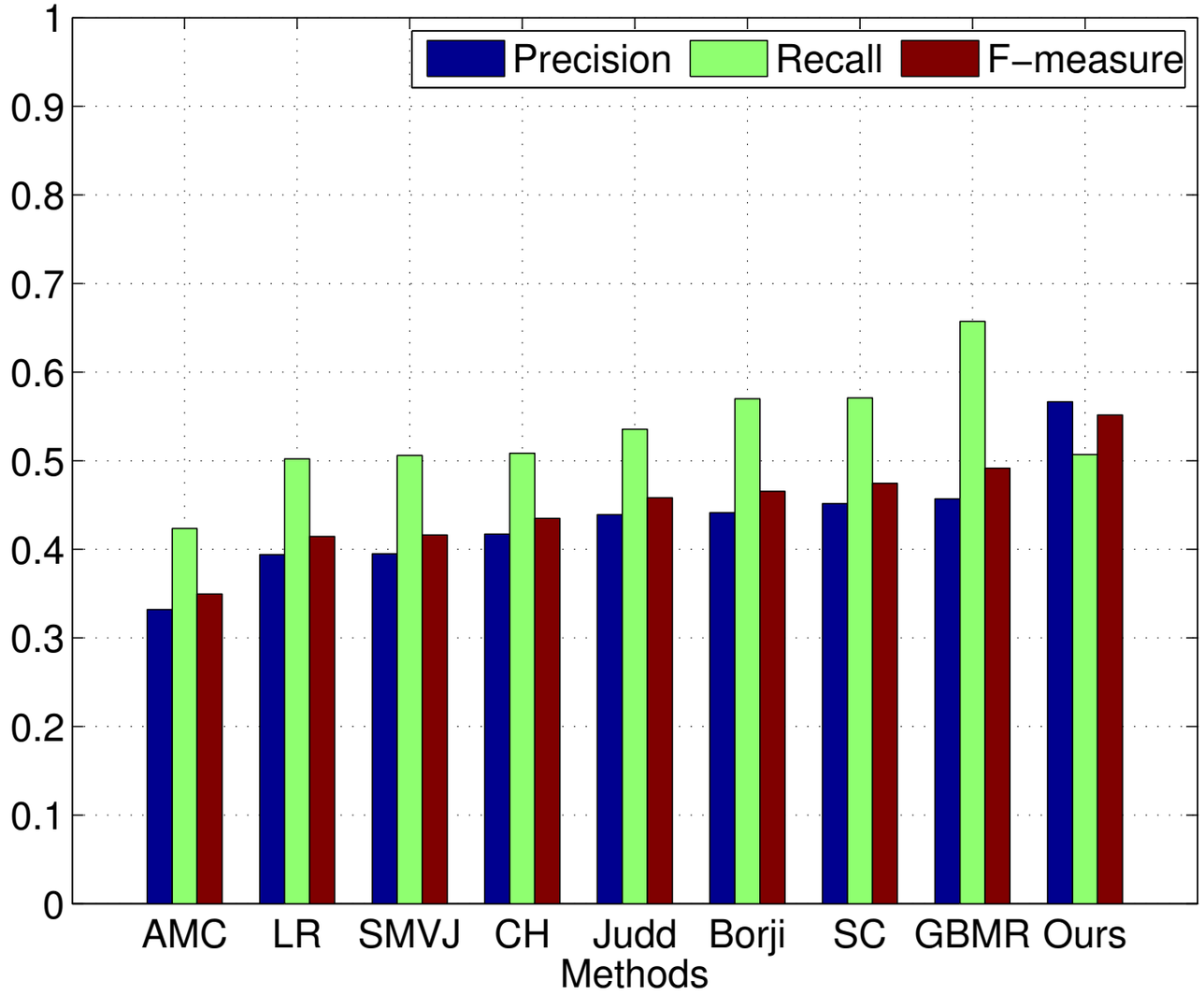
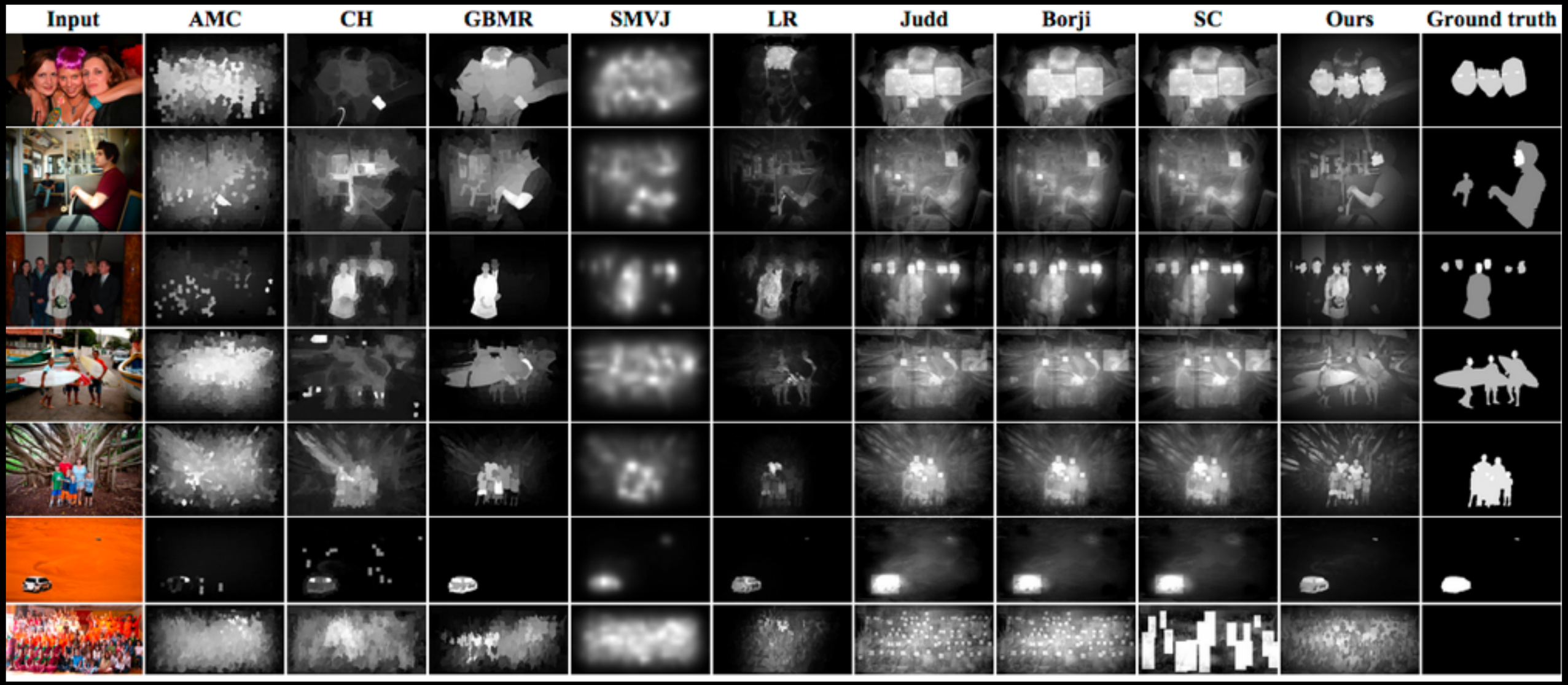


# Results


PR curves
Precision
Recall
AMC
CH
GBMR
SMVJ
LR
Judd
Borji
SC
Ours
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0
0.2
0.4
0.6
0.8
1


Precision
Recall
F−measure
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
AMC
LR
SMVJ
CH
Judd
Borji
SC
GBMR
Ours
Methods

# Results



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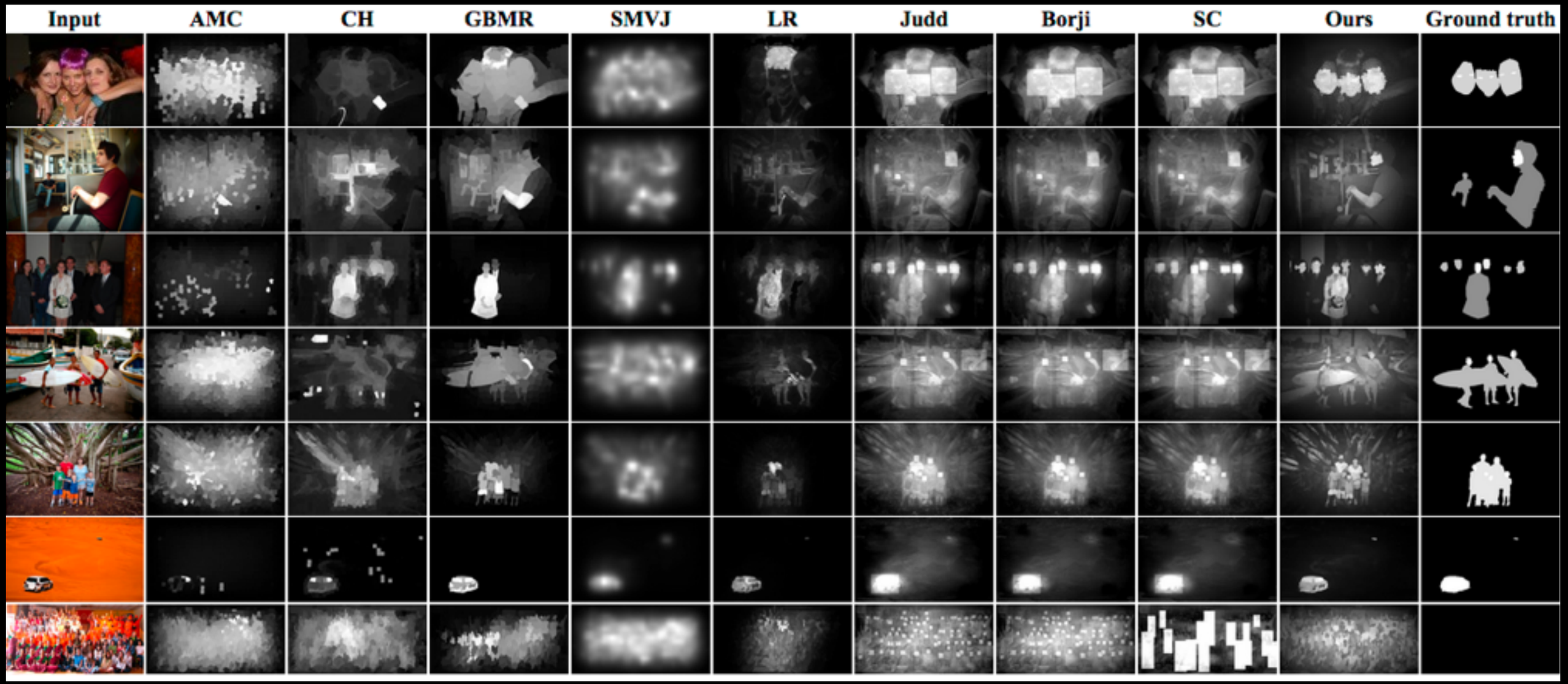
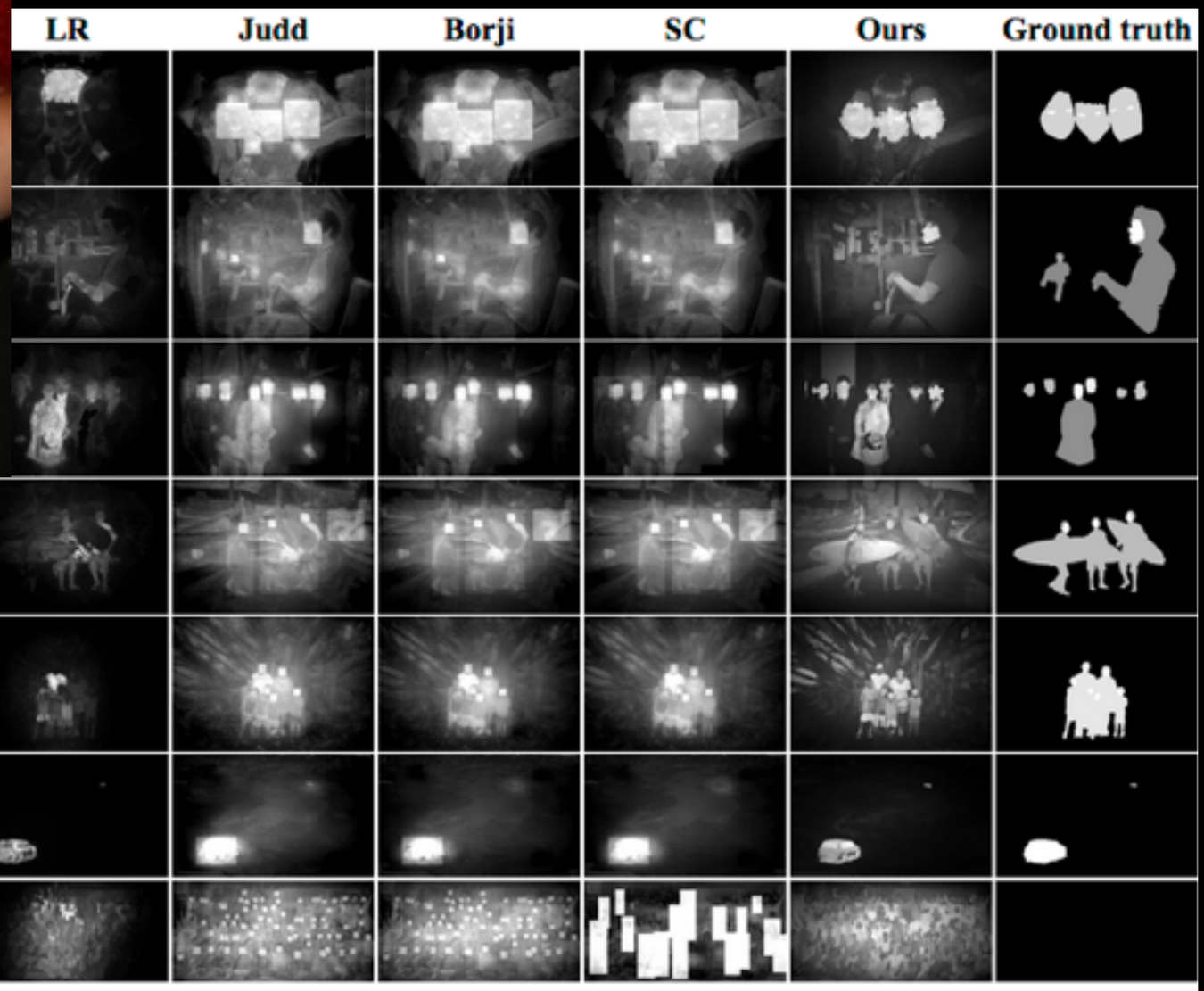


# Results



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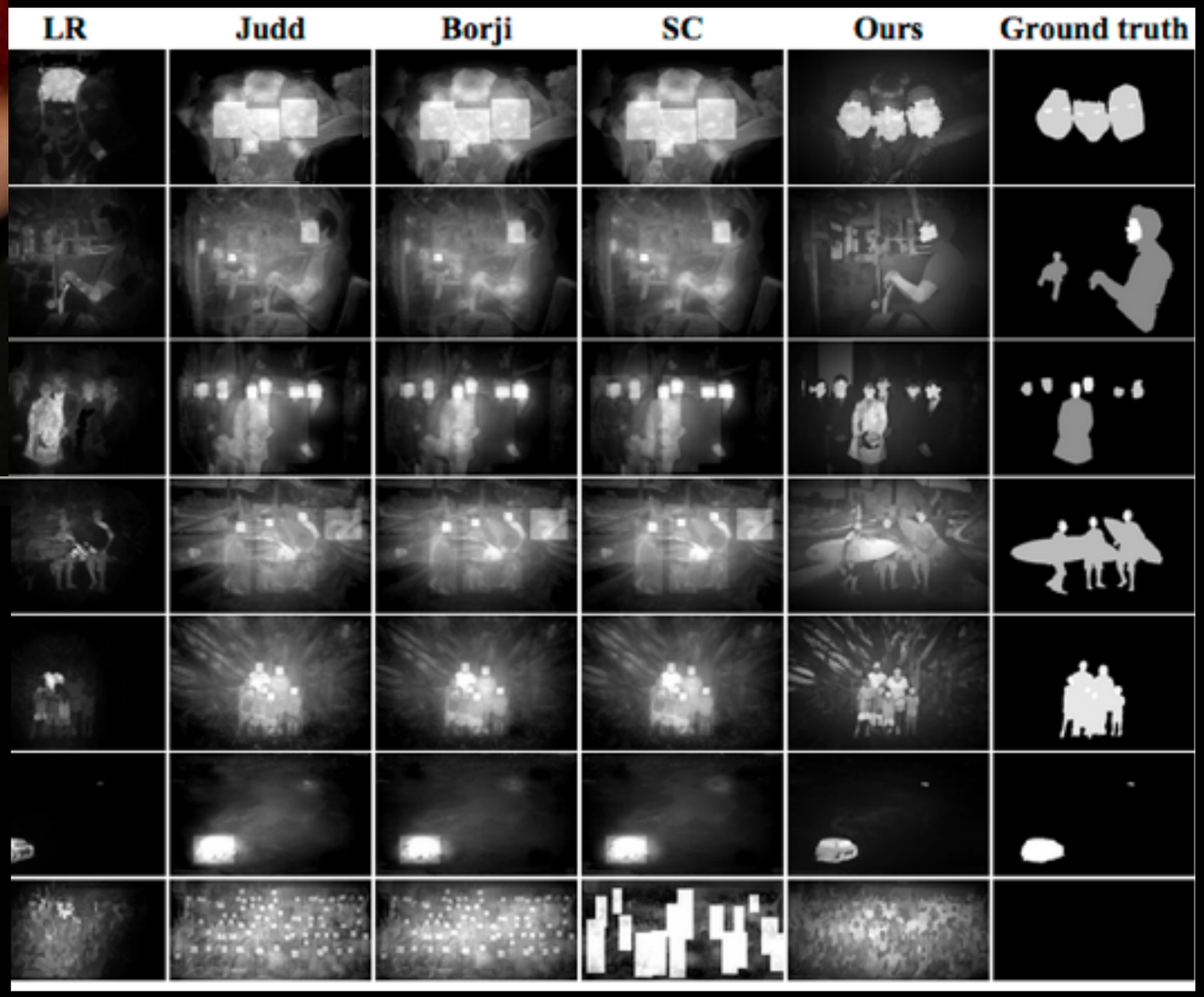

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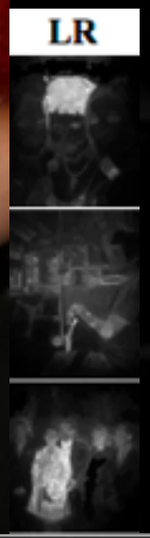


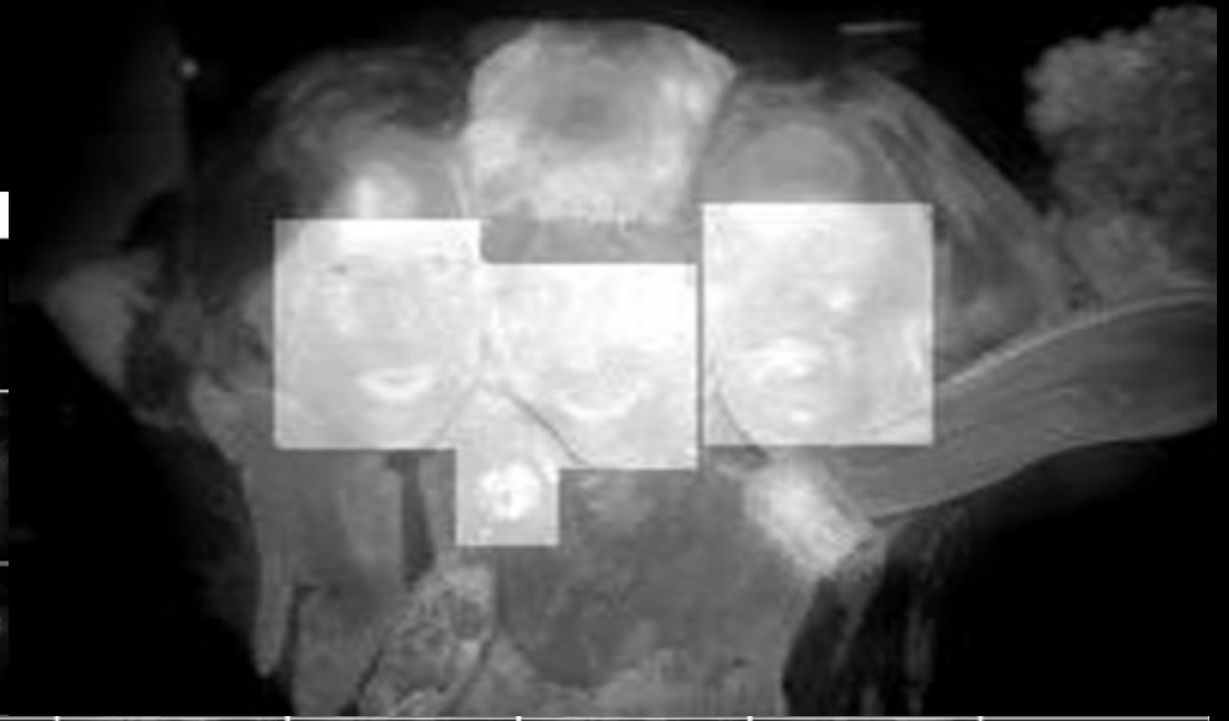

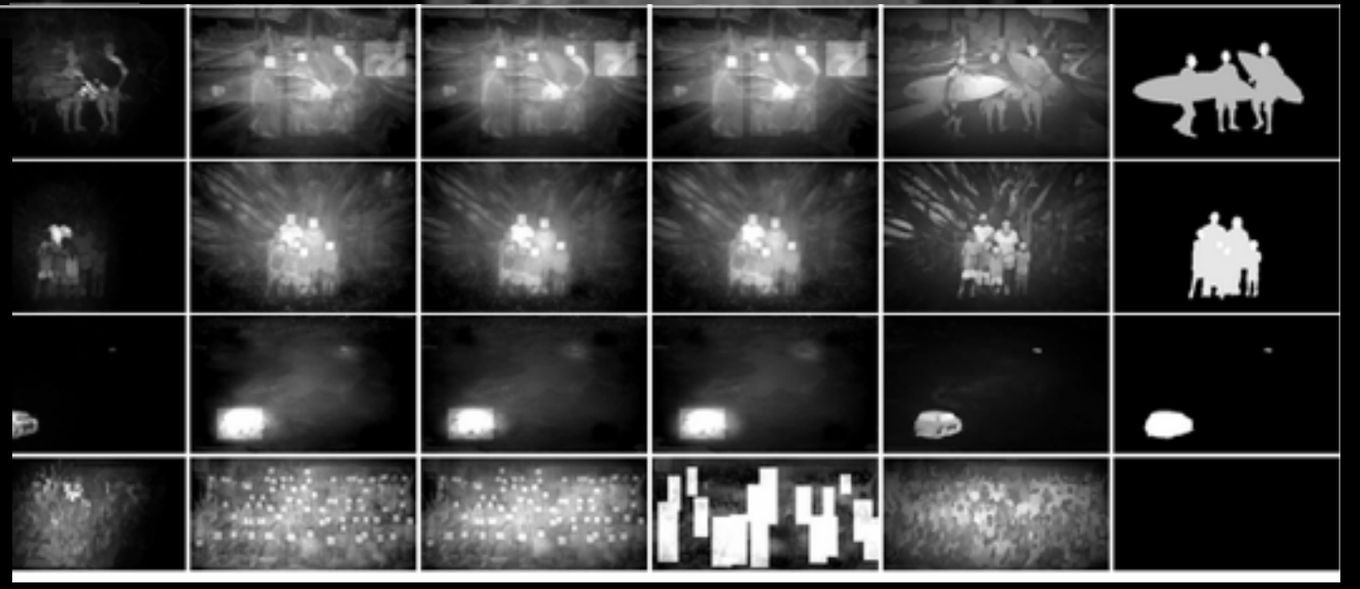

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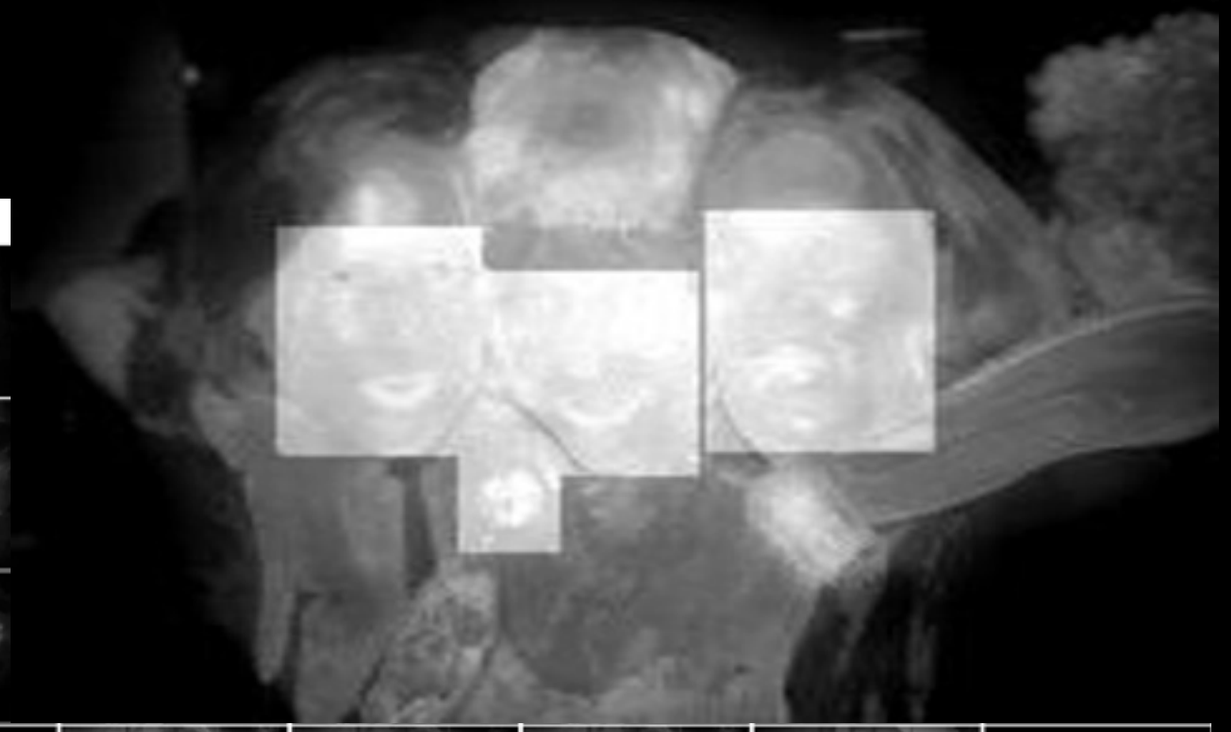

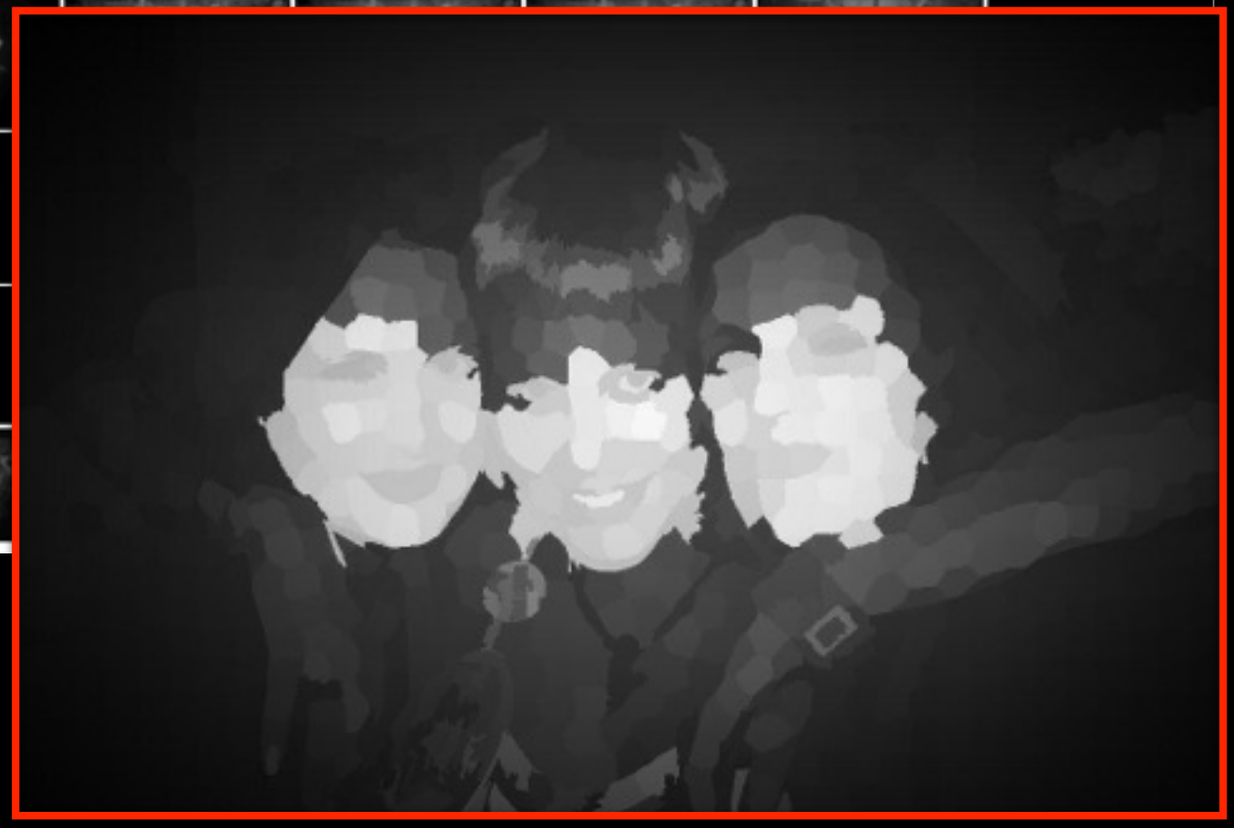

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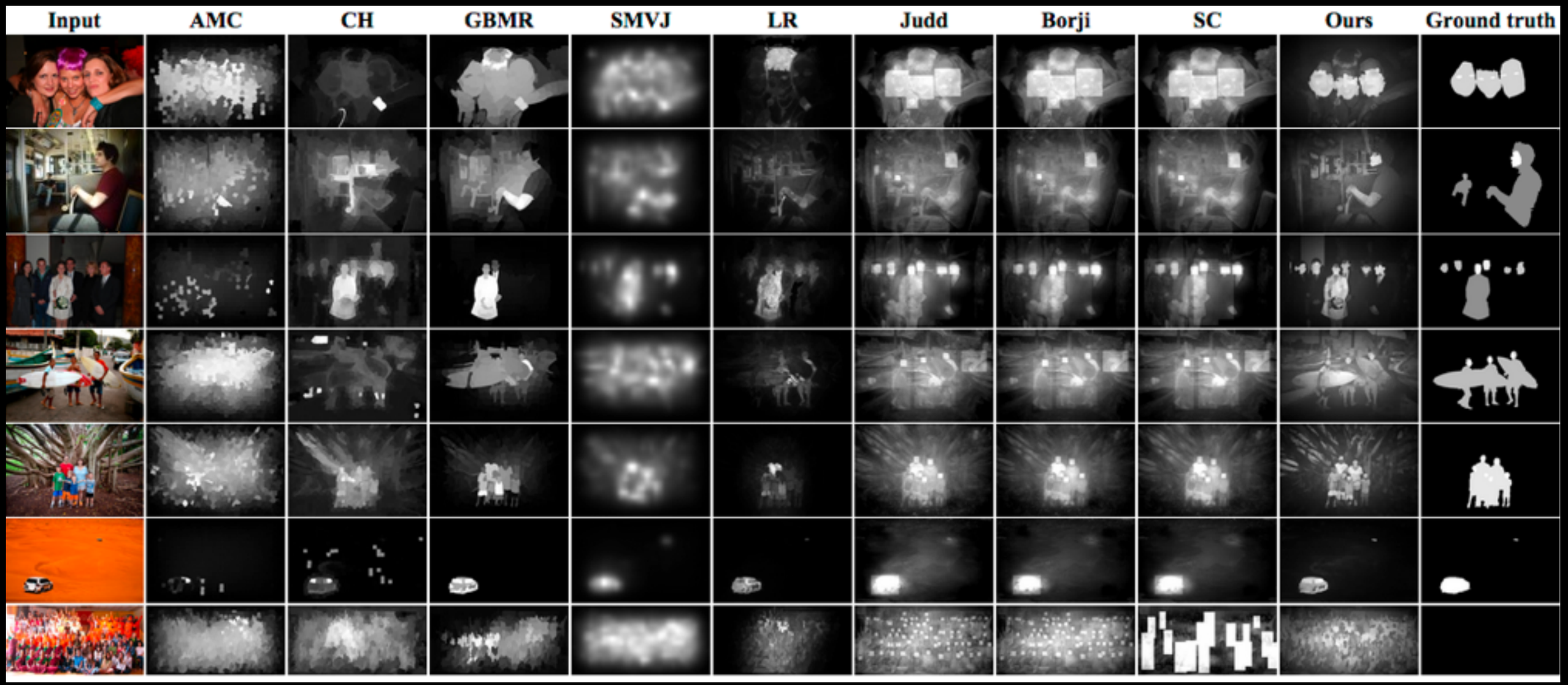

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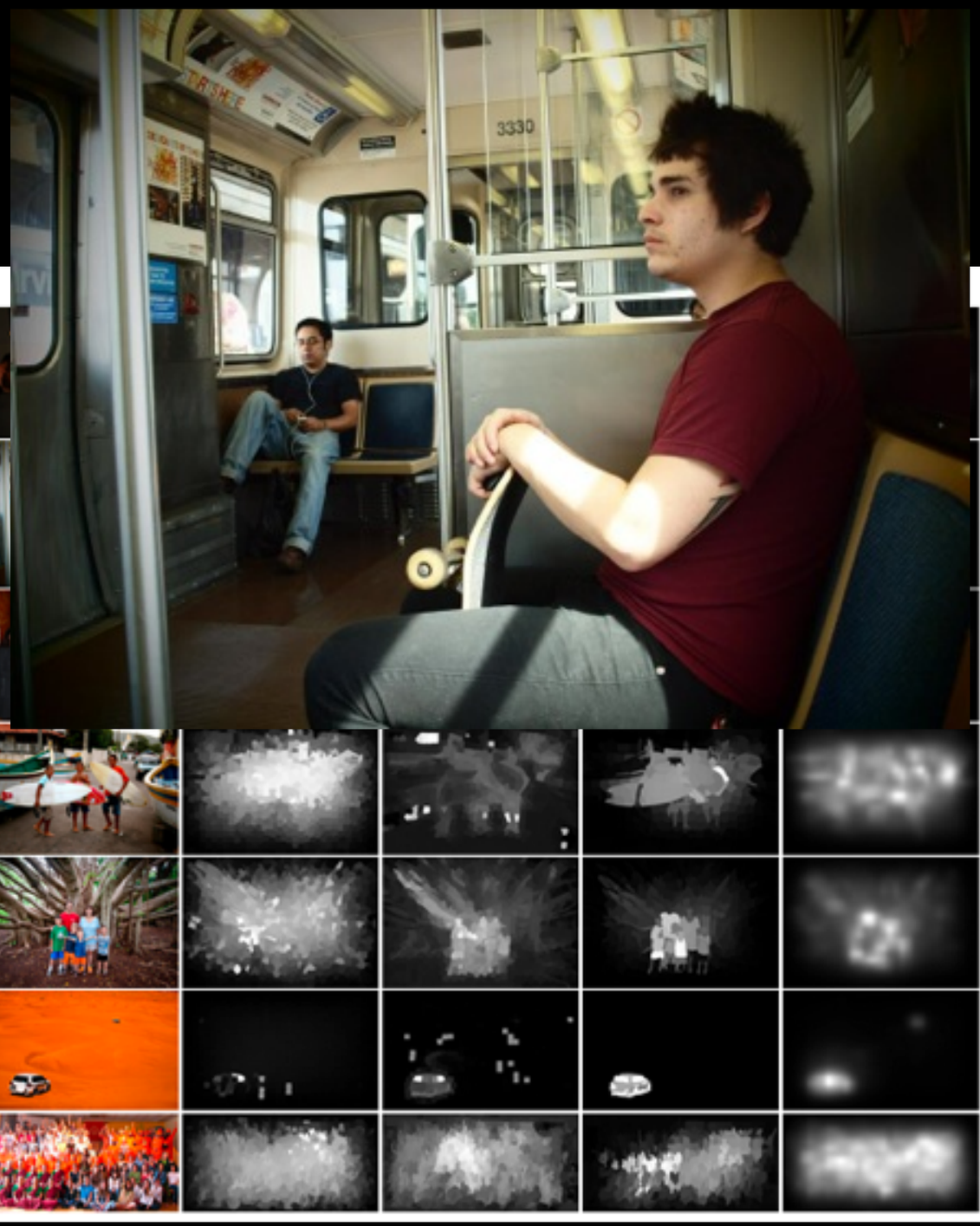

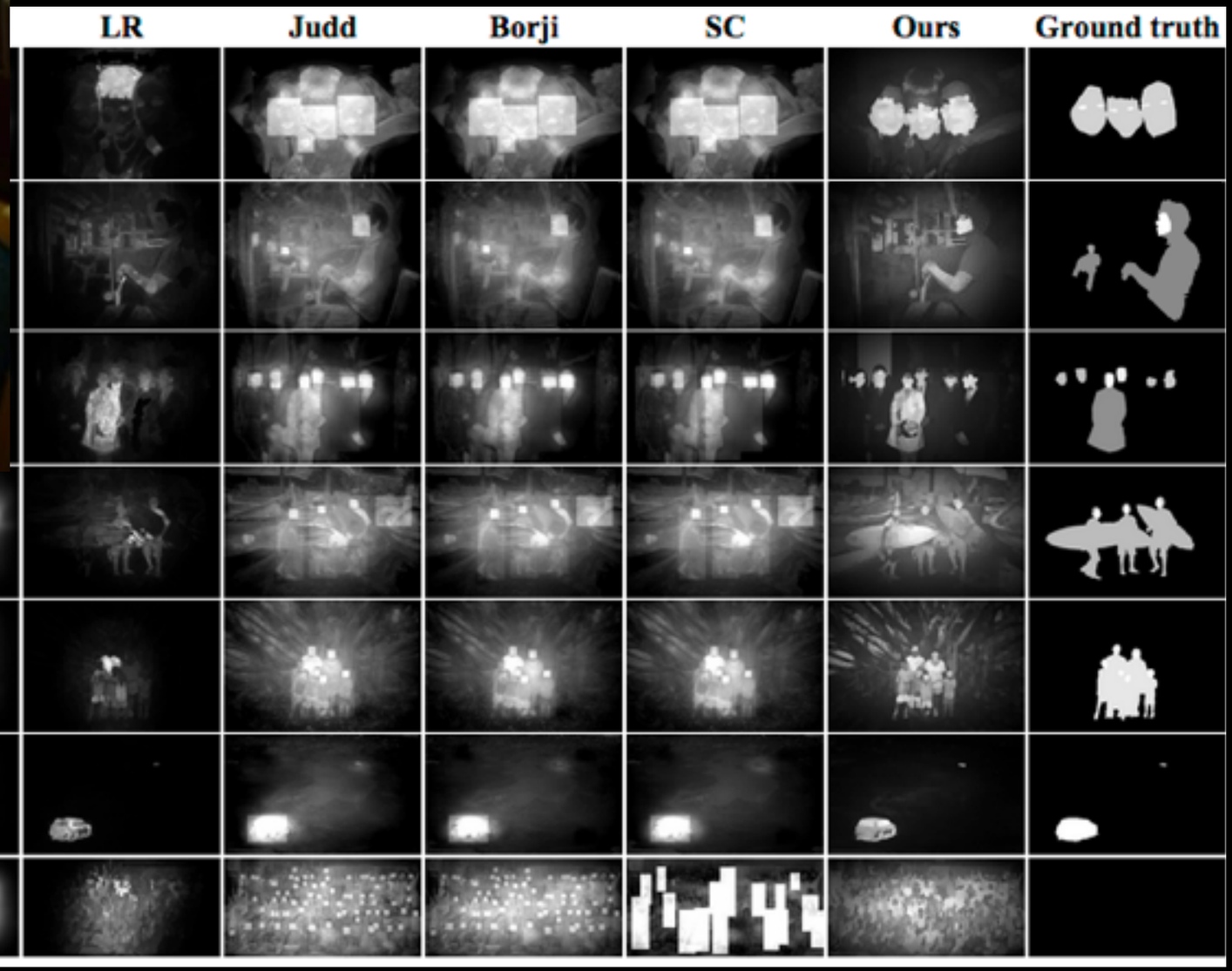

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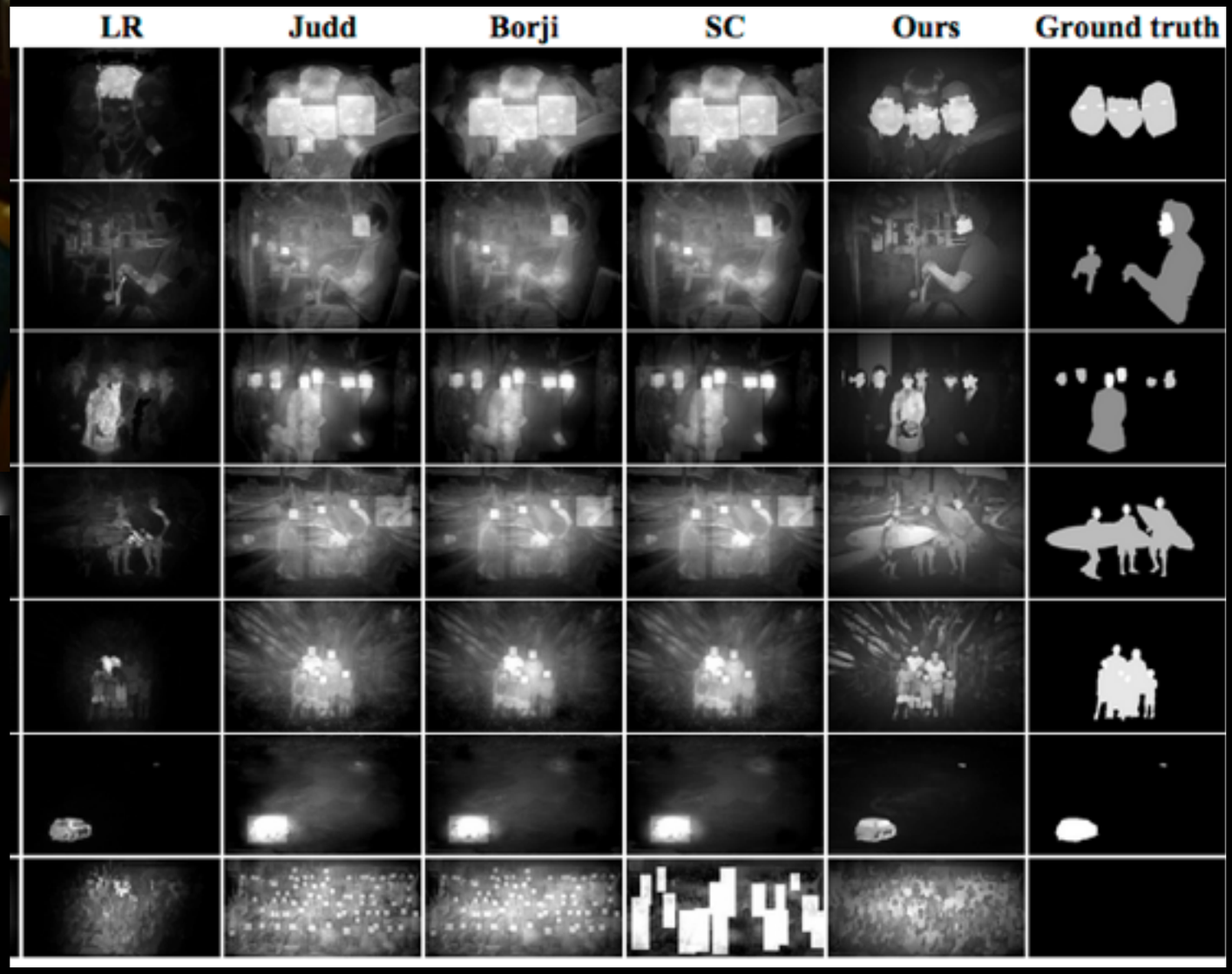

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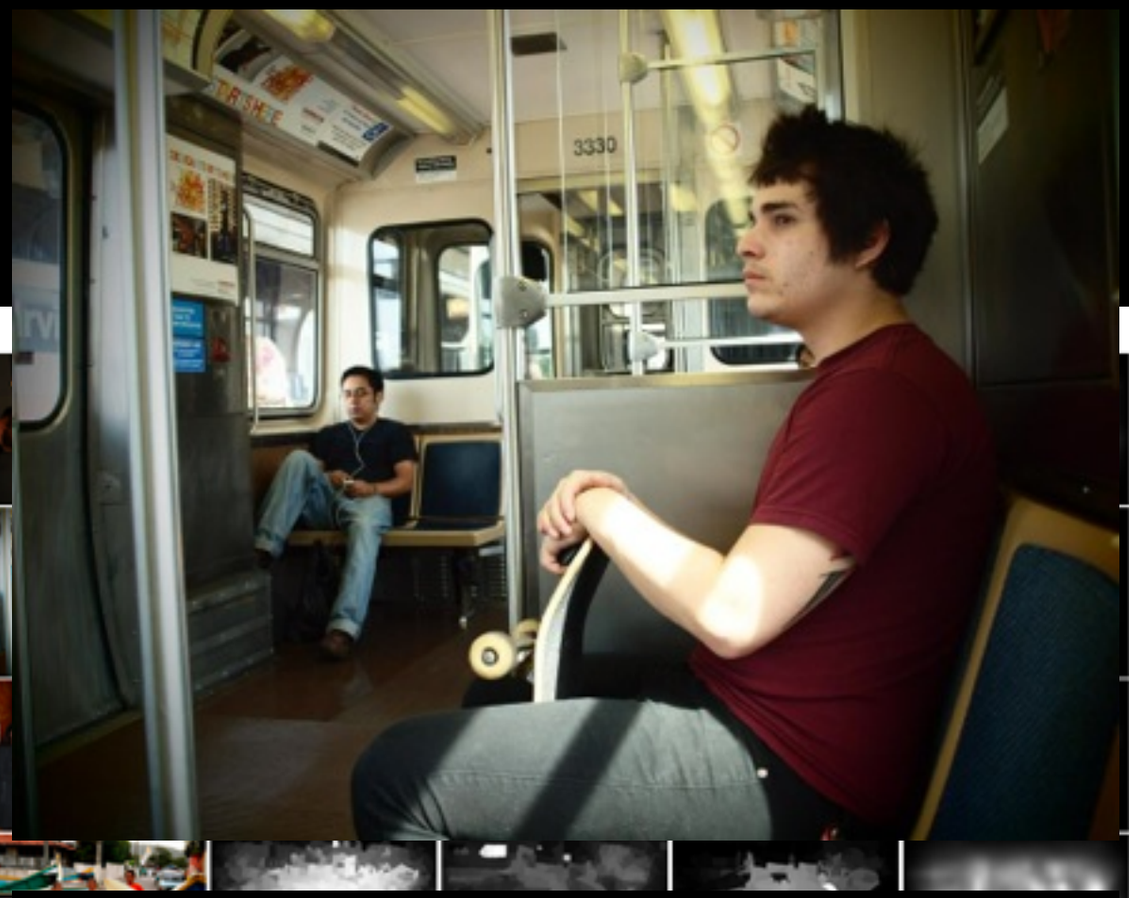

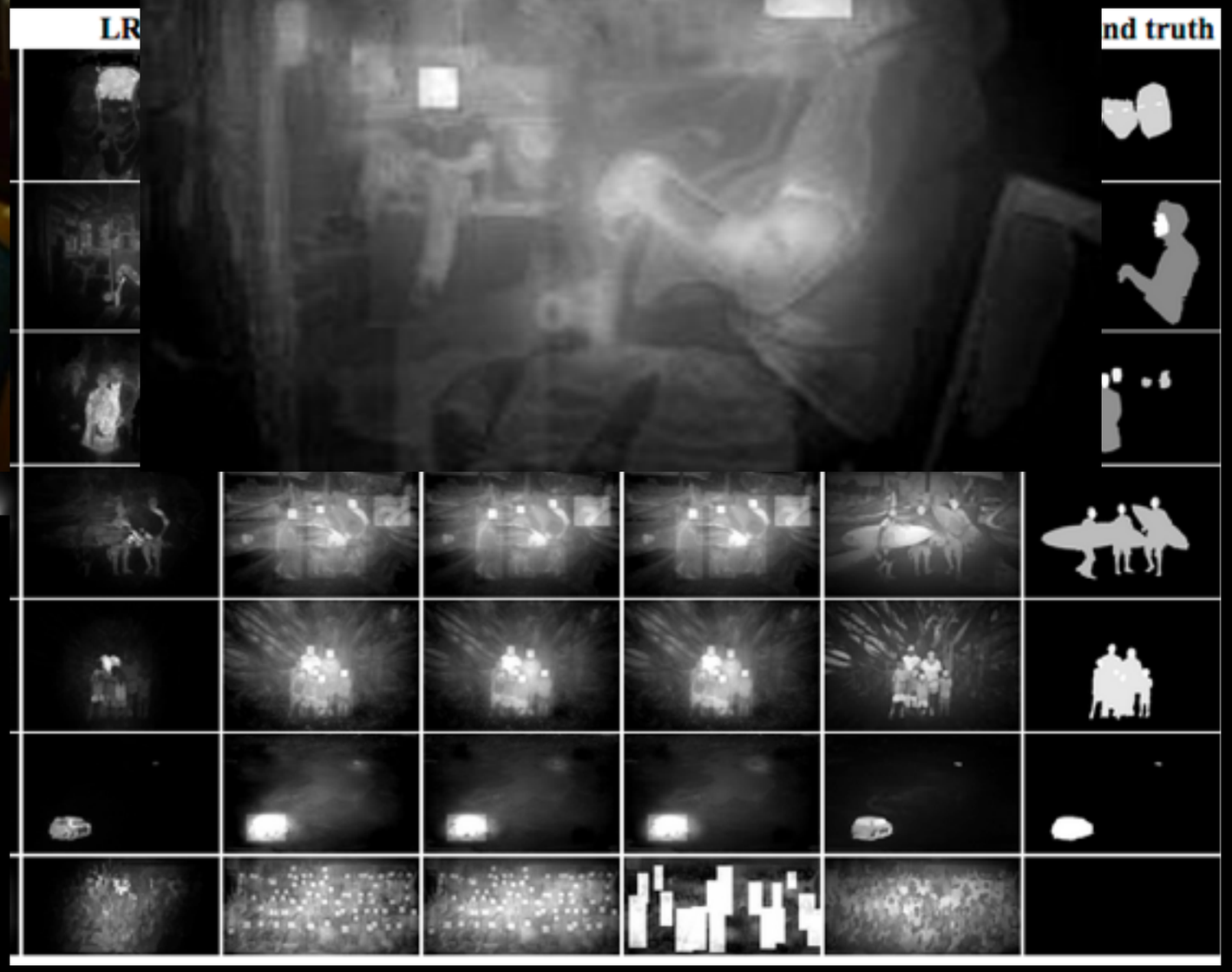

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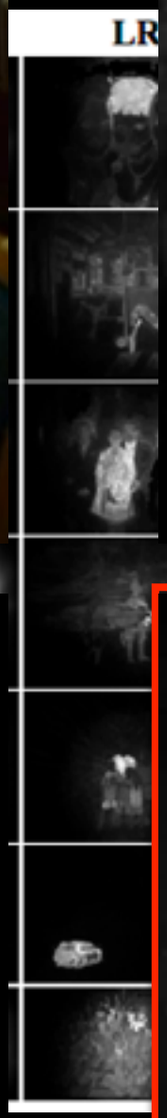

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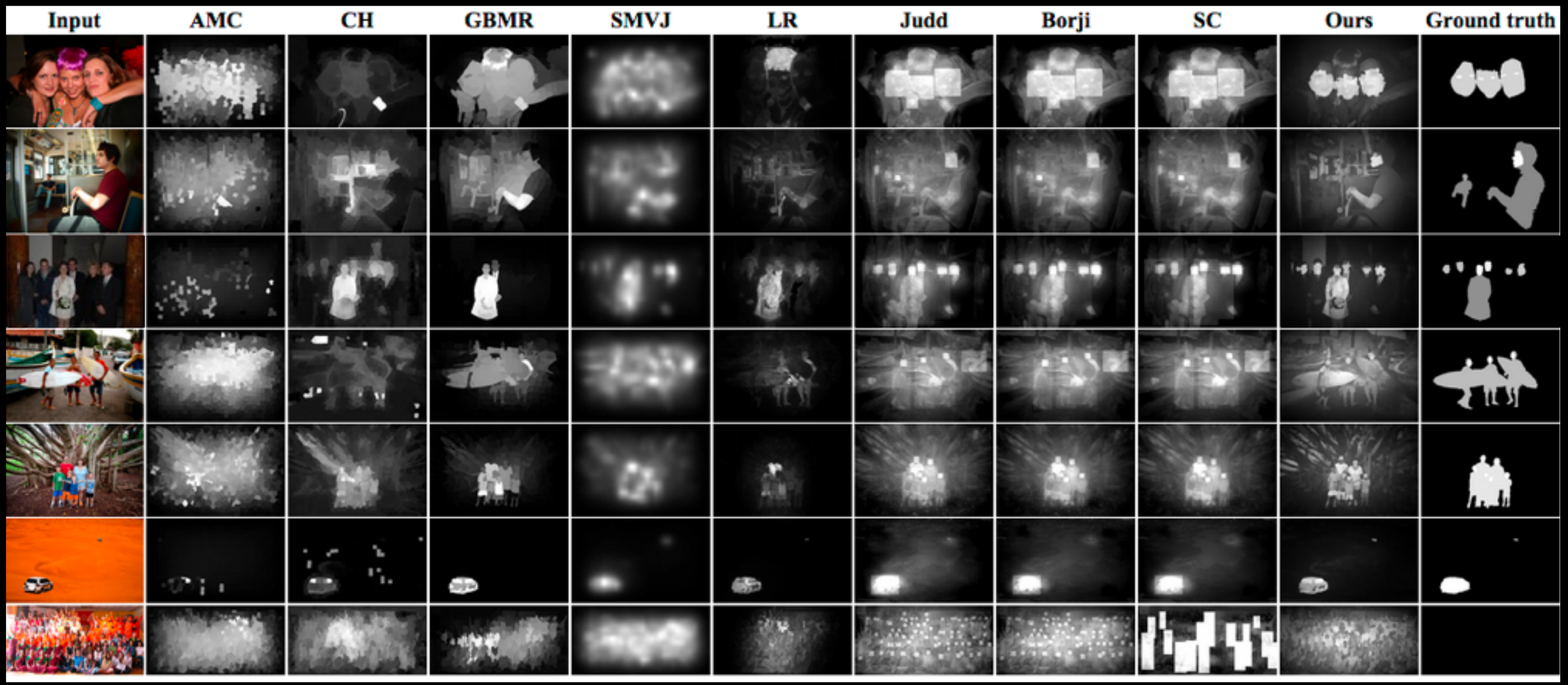

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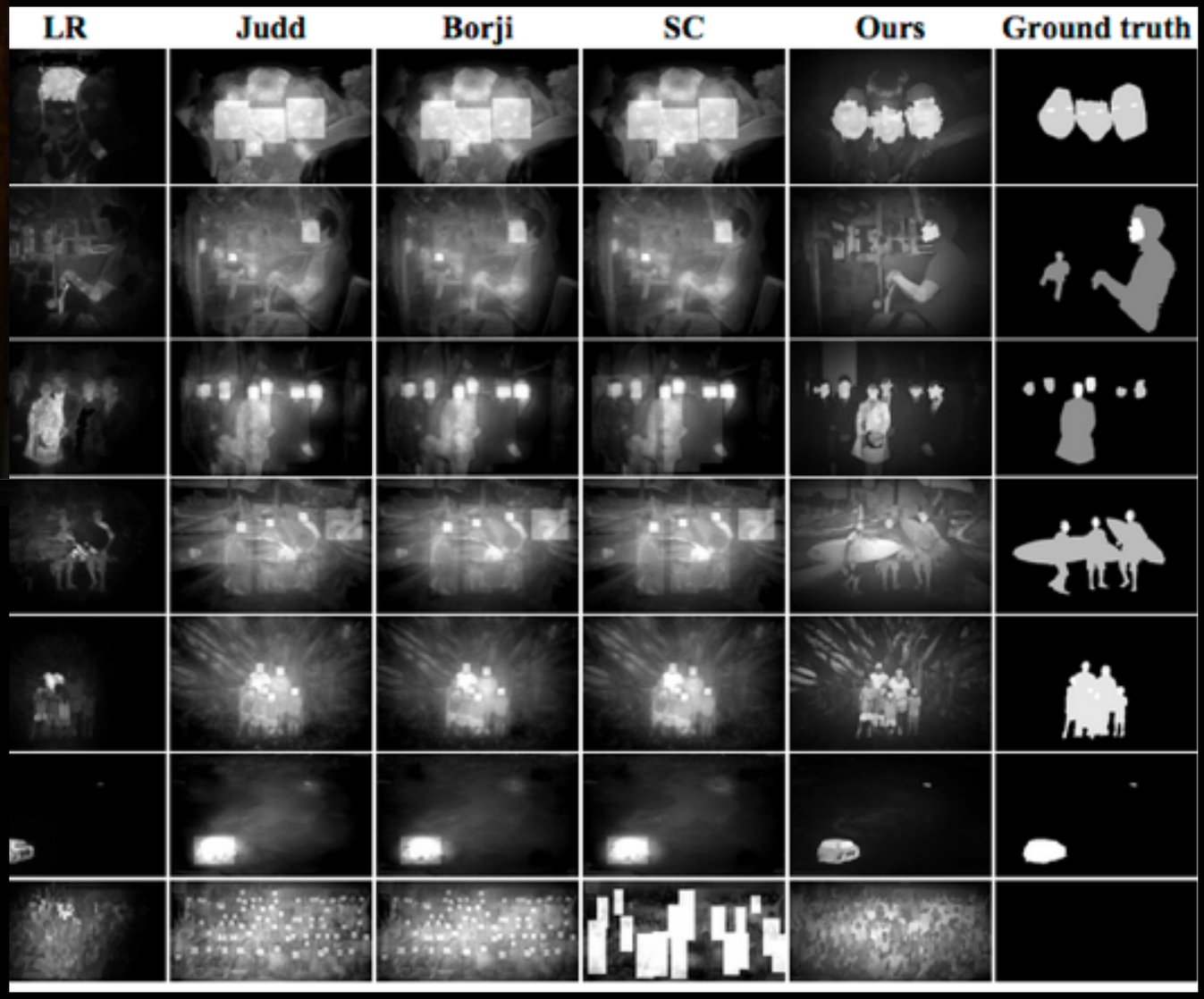

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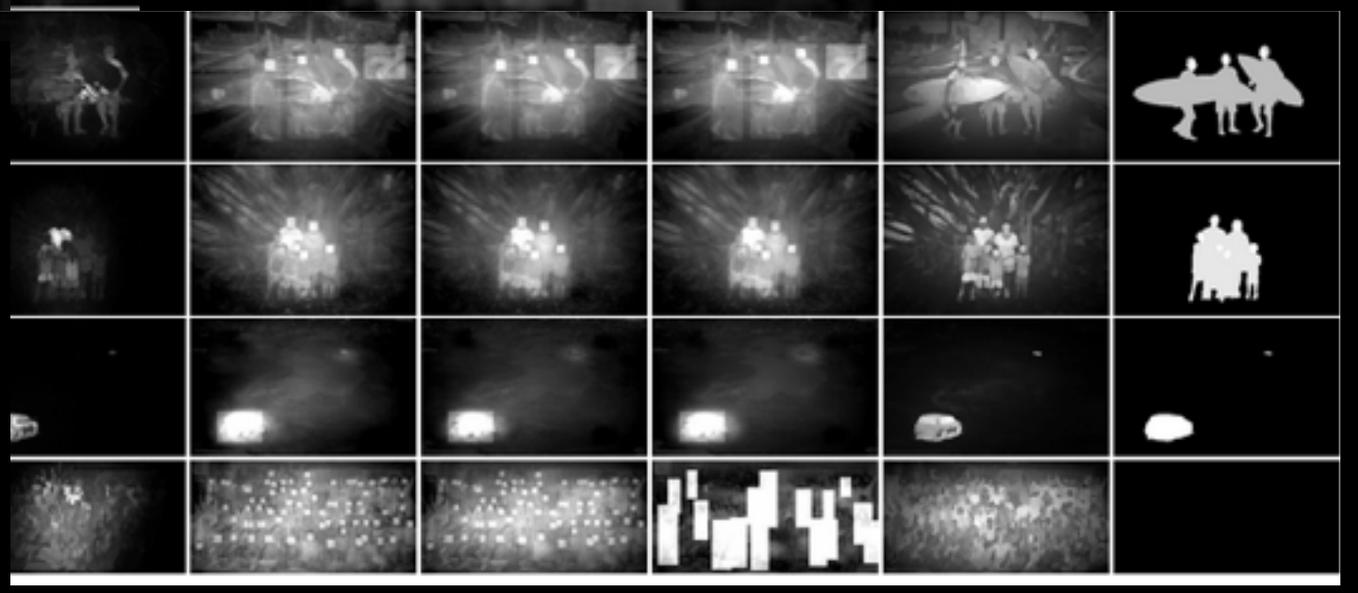

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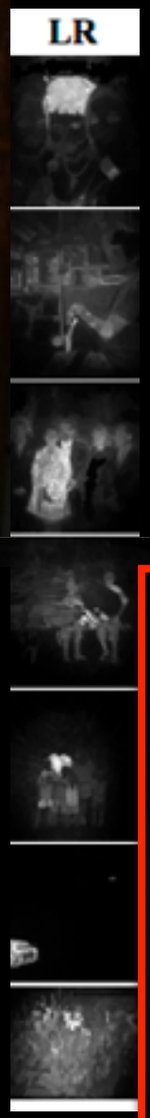

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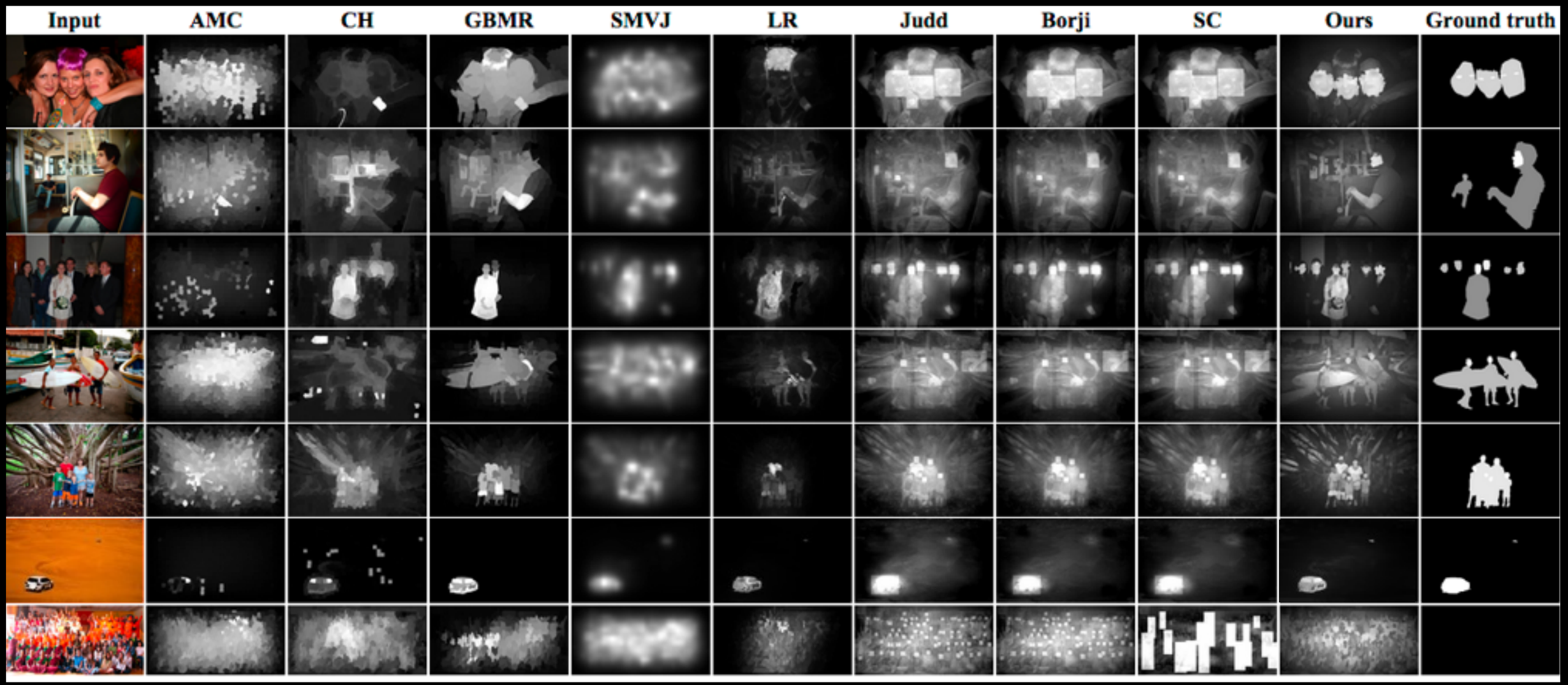

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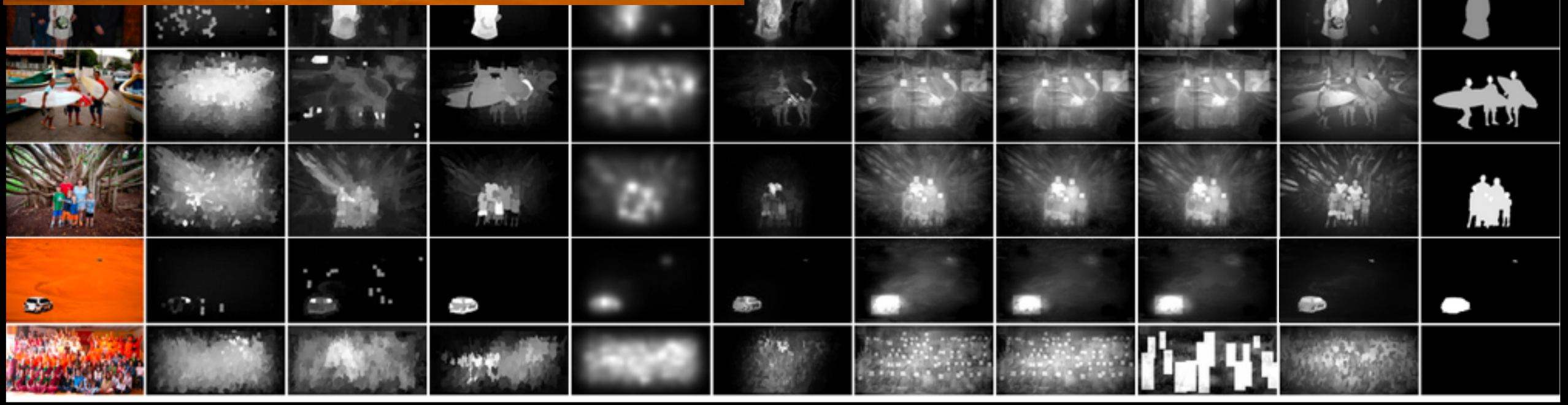

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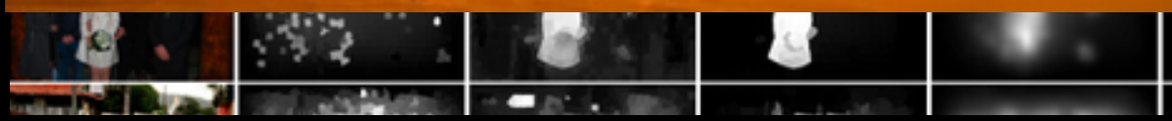

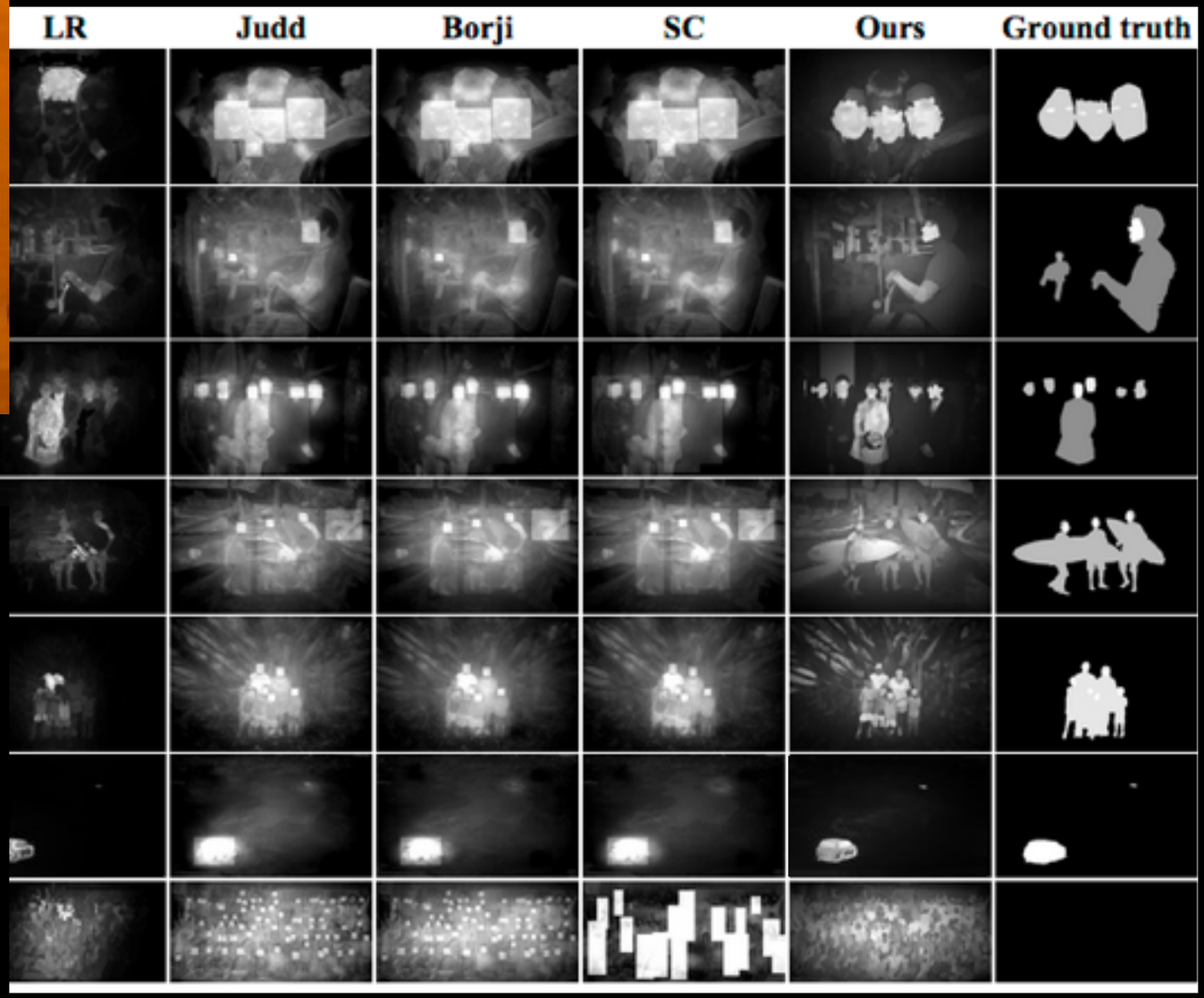

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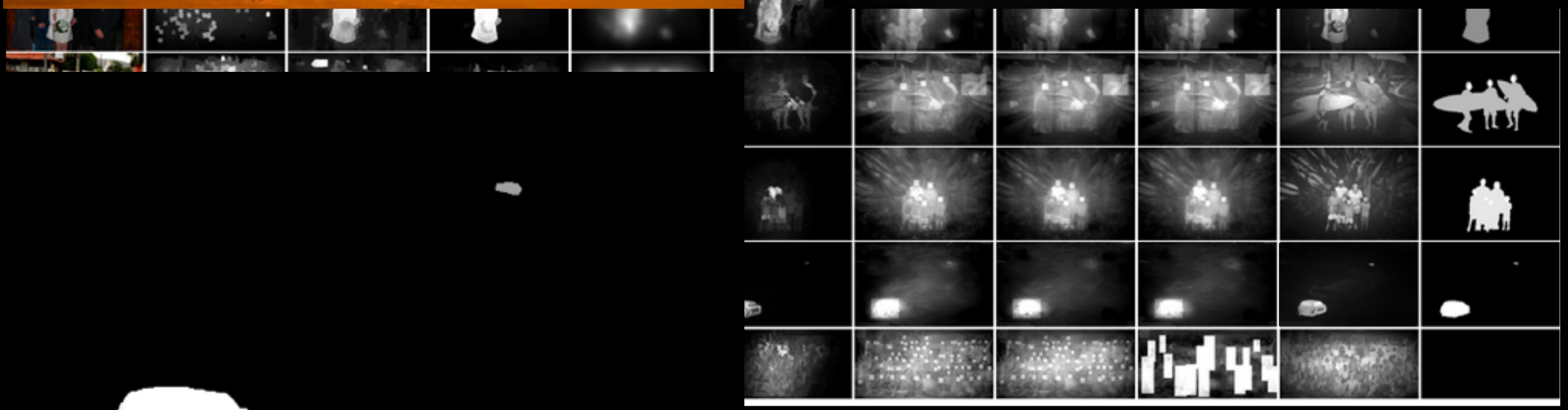

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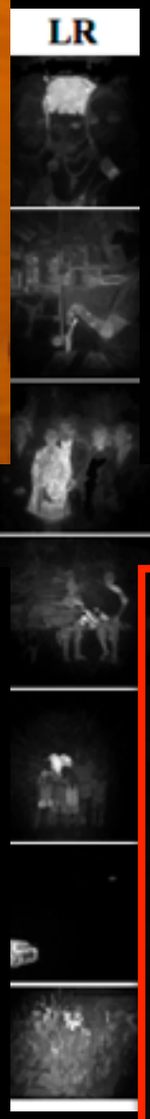

# Conclusion

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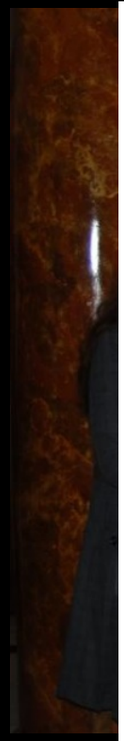
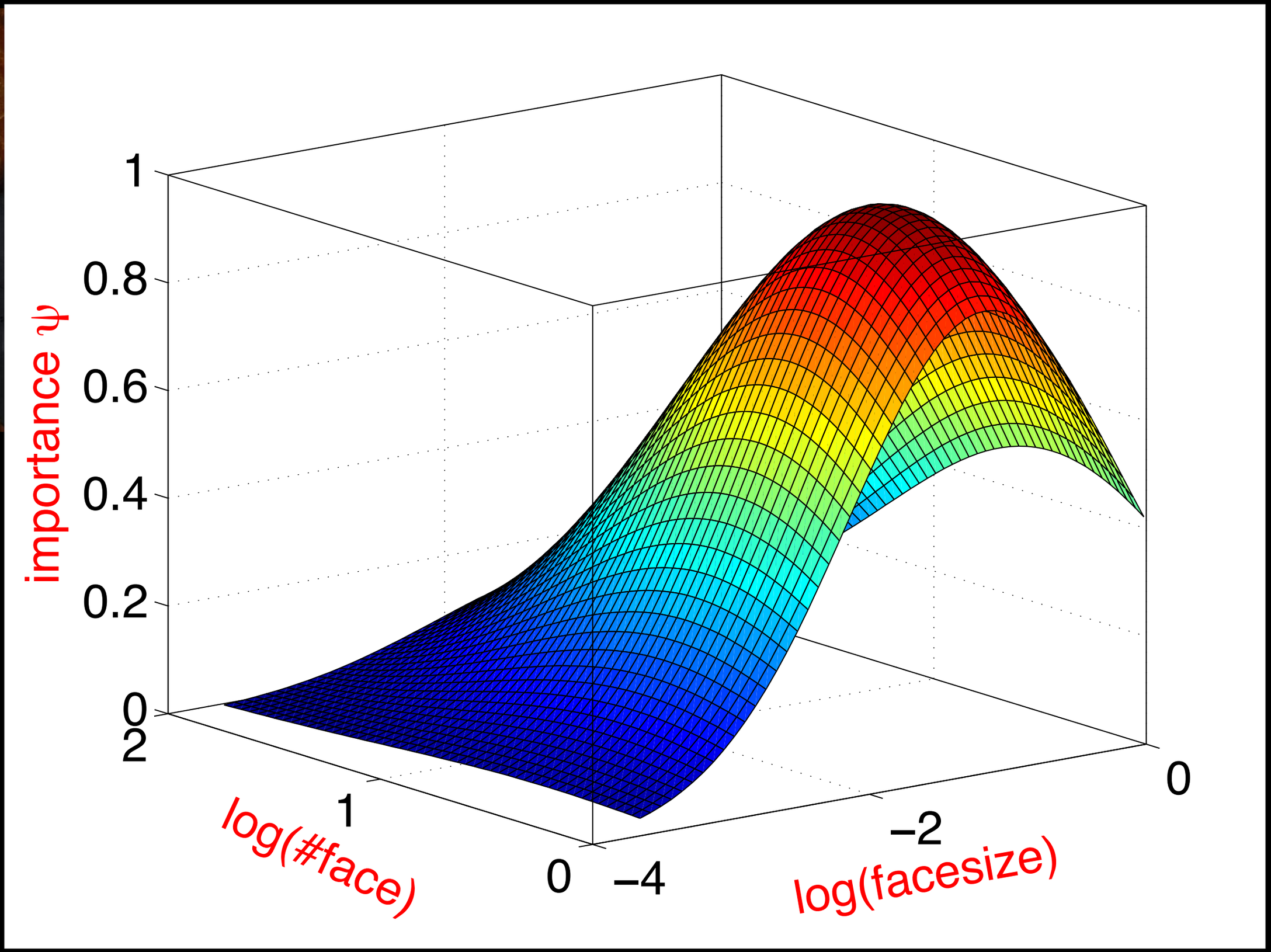
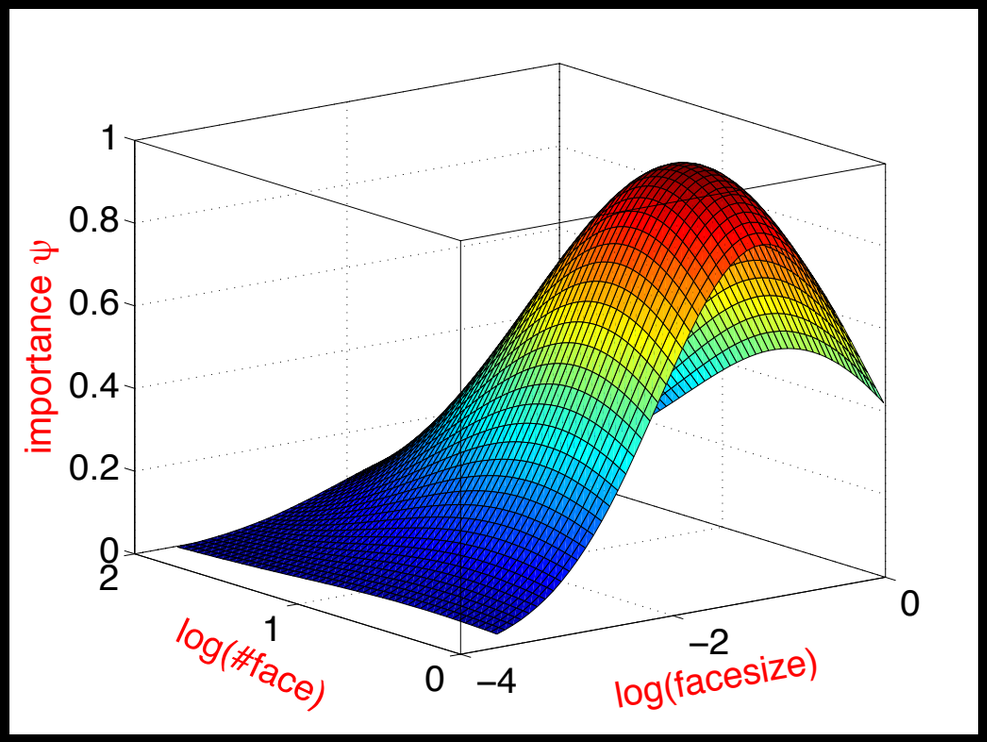




# Conclusion

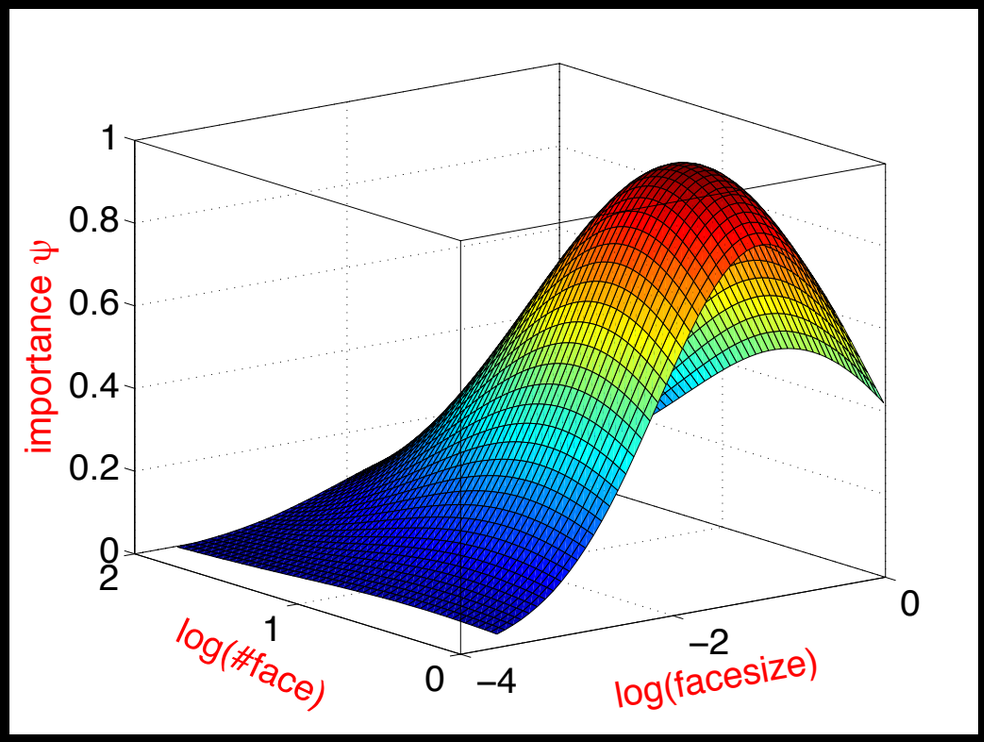



a face importance model

# Conclusion

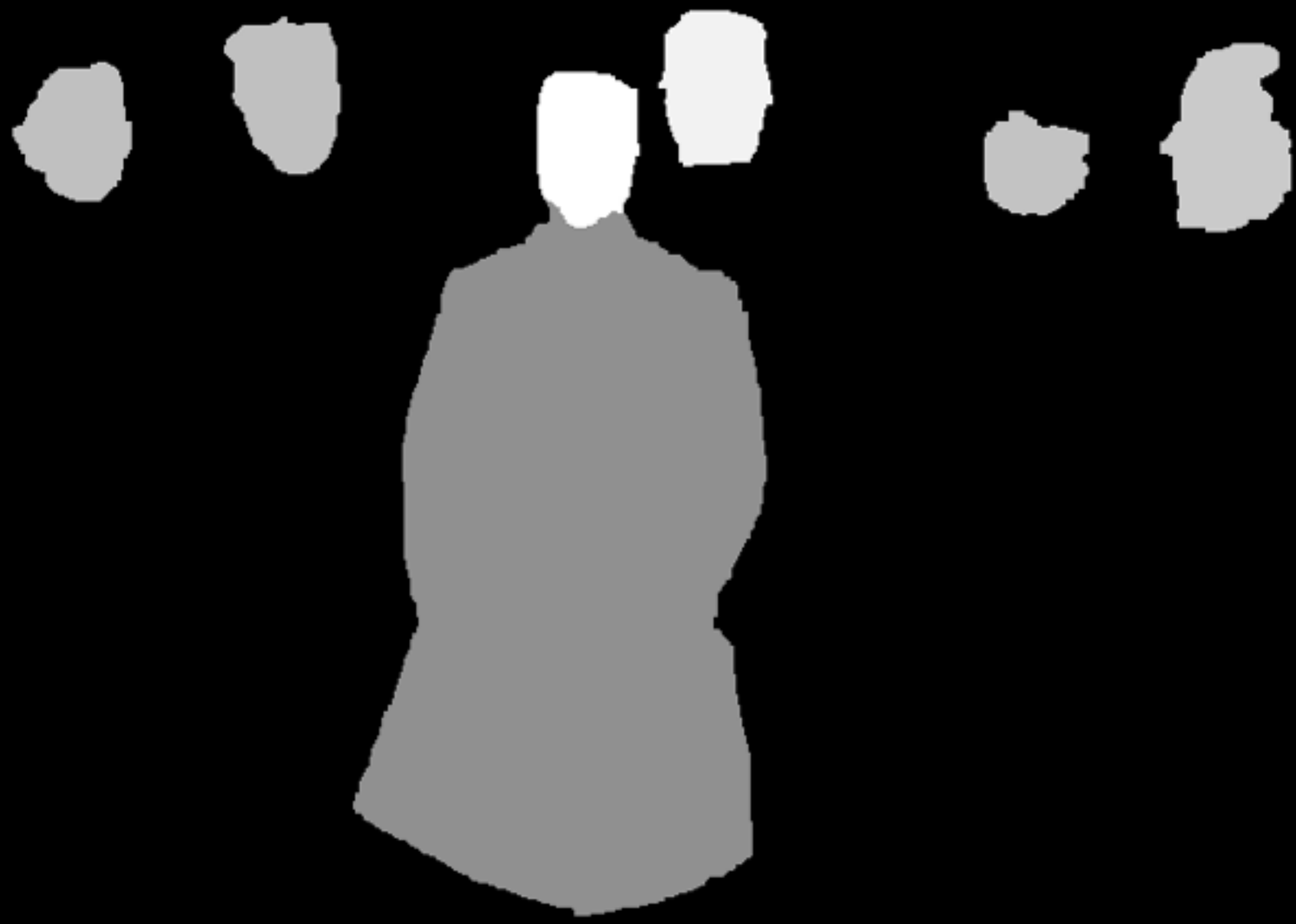
# Conclusion

a saliency algorithm



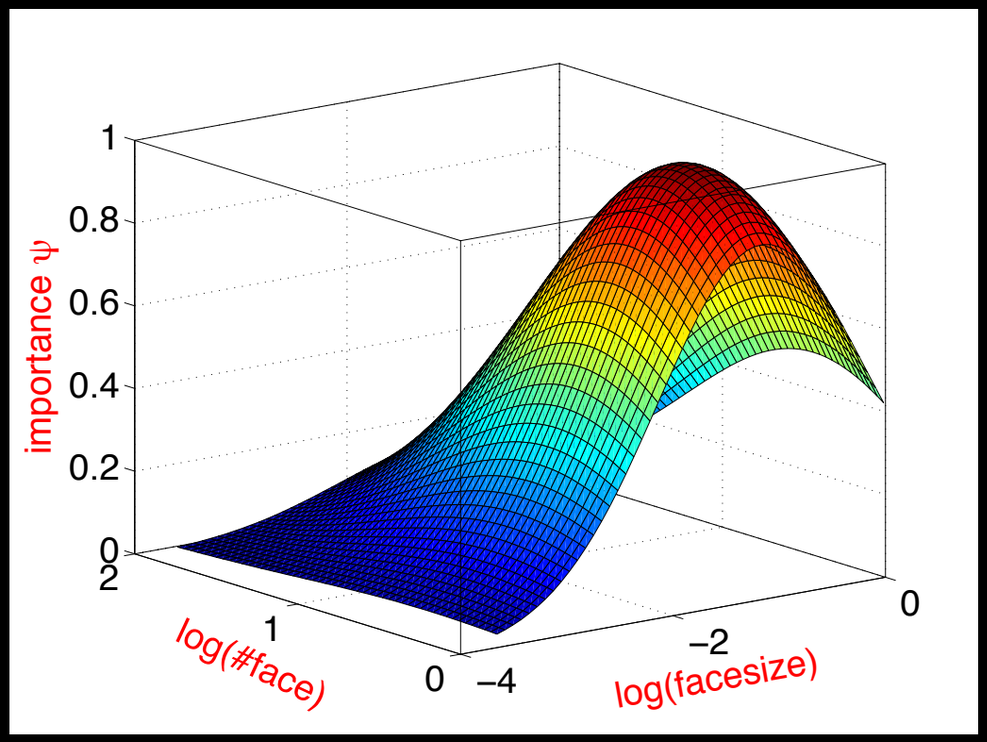

a face importance model

# Conclusion



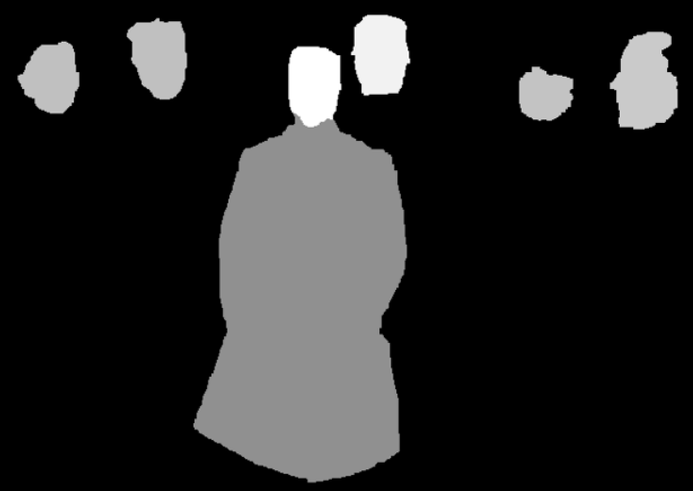
a saliency algorithm

# Conclusion




a face importance model

a saliency algorithm



a saliency dataset

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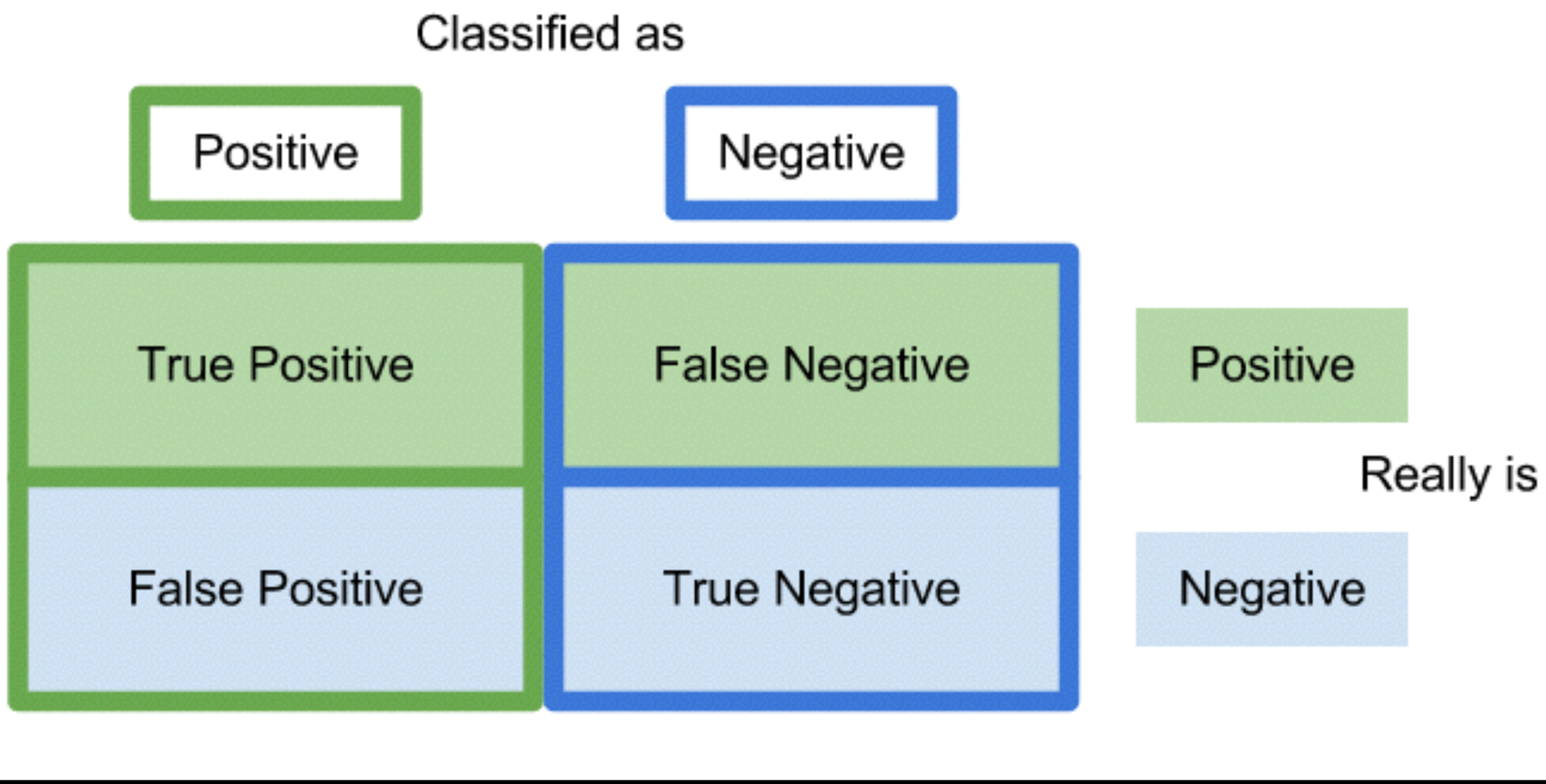
# Thank you!

precision = tp / (tp + fp)
recall = tp / (tp + fn)



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# Saliency vs importance

- Wang, J., Chandler, D. M., and Le Callet, P., "Quantifying the relationship between visual salience and visual importance," IS&T/SPIE HVEI (2010): 80-90% overlap between importance and visual gaze.
- Crowd-sourcing needs to be easy.
- Application-oriented.