



UNIVERSITY OF  
MICHIGAN

# EECS 442 Group Project

## Surface Normals Prediction From a Single Image

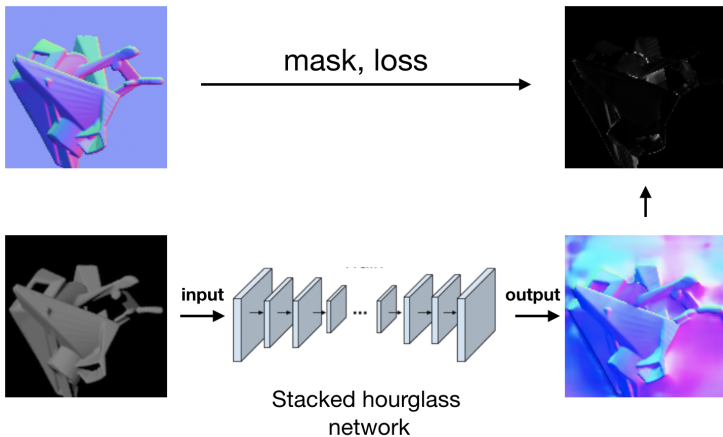
J.D. Fans  
Shengyi Qian, Linyi Jin, Yichen Yang

January 16, 2019

# Method

Method

References



# Implementation Details

Method

References

- We modify the preprocess part for Hourglass network. We only use  $3 \times 3$  kernel and the input size to hourglass is (128, 128, 256).
- We propose a novel loss function. Suppose our prediction is  $N$  and the ground true is  $N'$ ,

$$\mathcal{L}(N, N') = \arccos(N \cdot N') + \lambda \cdot \sum_{i=1}^3 (N_i - N'_i)^2$$



# References

Method

References

- 1 Dharmasiri et al., “Joint Prediction of Depths, Normals and Surface Curvature from RGB Images using CNNs”.  
<https://arxiv.org/abs/1706.07593>
- 2 Newell et al., “Stacked Hourglass Networks for Human Pose Estimation”.  
<https://arxiv.org/abs/1603.06937>
- 3 Training code for “Associative Embedding: End-to-End Learning for Joint Detection and Grouping”  
<https://github.com/umich-vl/pose-ae-train>
- 4 Yang et al., “Shape from Shading through Shape Evolution”.  
<https://arxiv.org/abs/1712.02961>

