

1. Sample Estimation



Dataset: MORPH
Real Age: 47
Esti. Age: 46.999



Dataset: MORPH
Real Age: 22
Esti. Age: 22.216



Dataset: MegaAge-Asian
Real Age: 28
Esti. Age: 28.000

DURF 2020

Yijian Liu

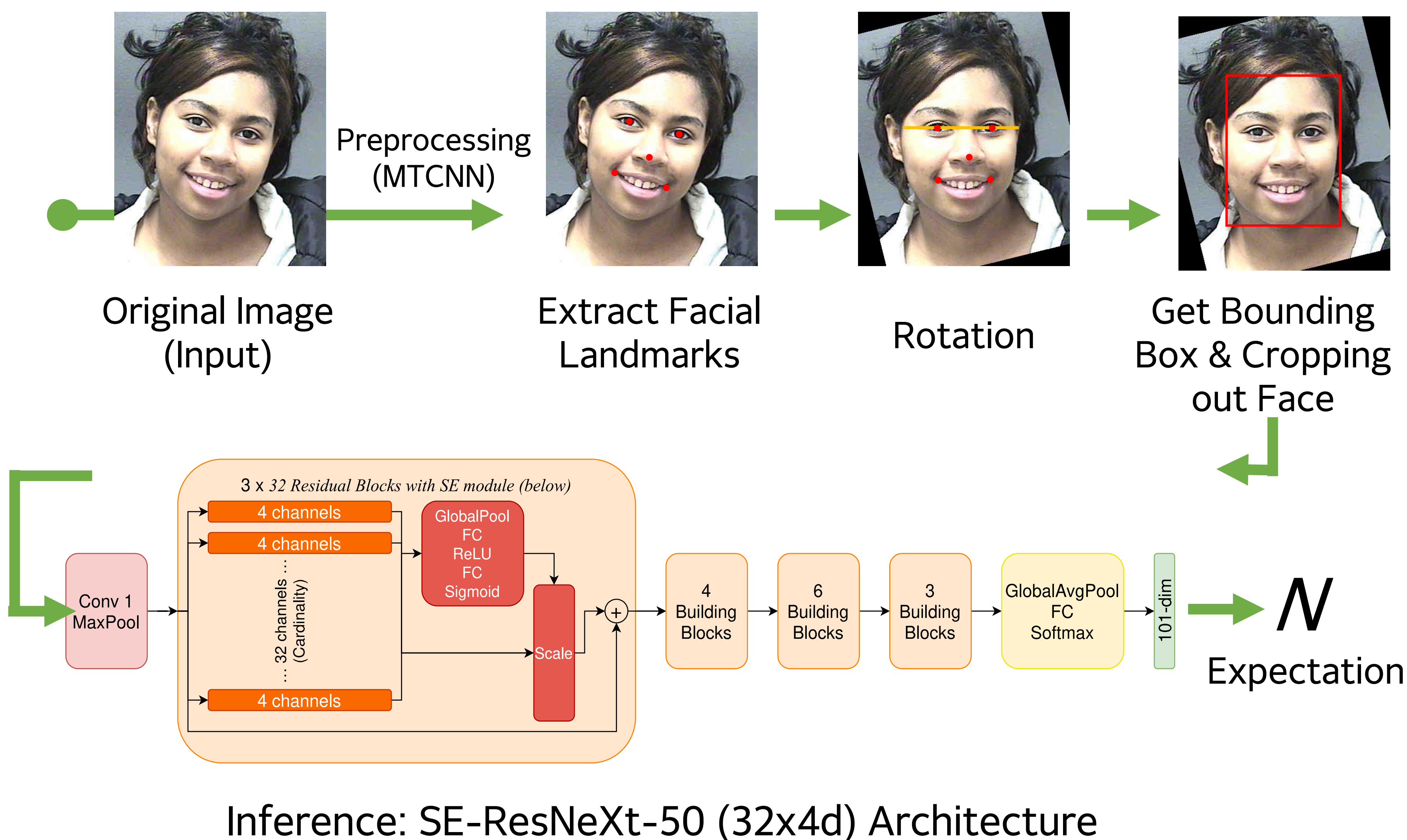
Computer Science

Supervised by Li Guo

Facial Age Estimation with Deep Neural Network

2. Estimation Pipeline

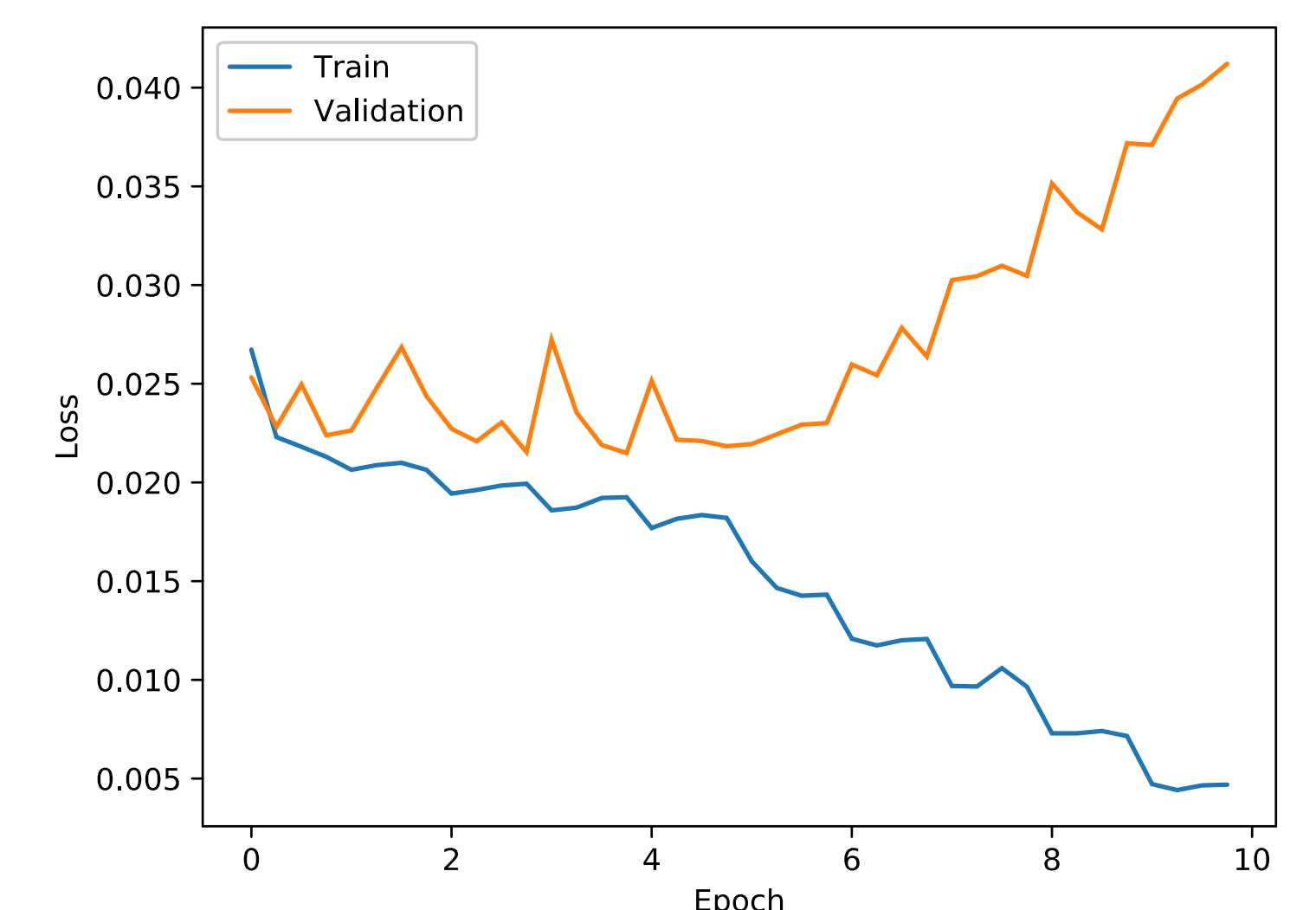
The expansion of the cropping area is measured by **expansion factor**, which can affect the performance of predication.



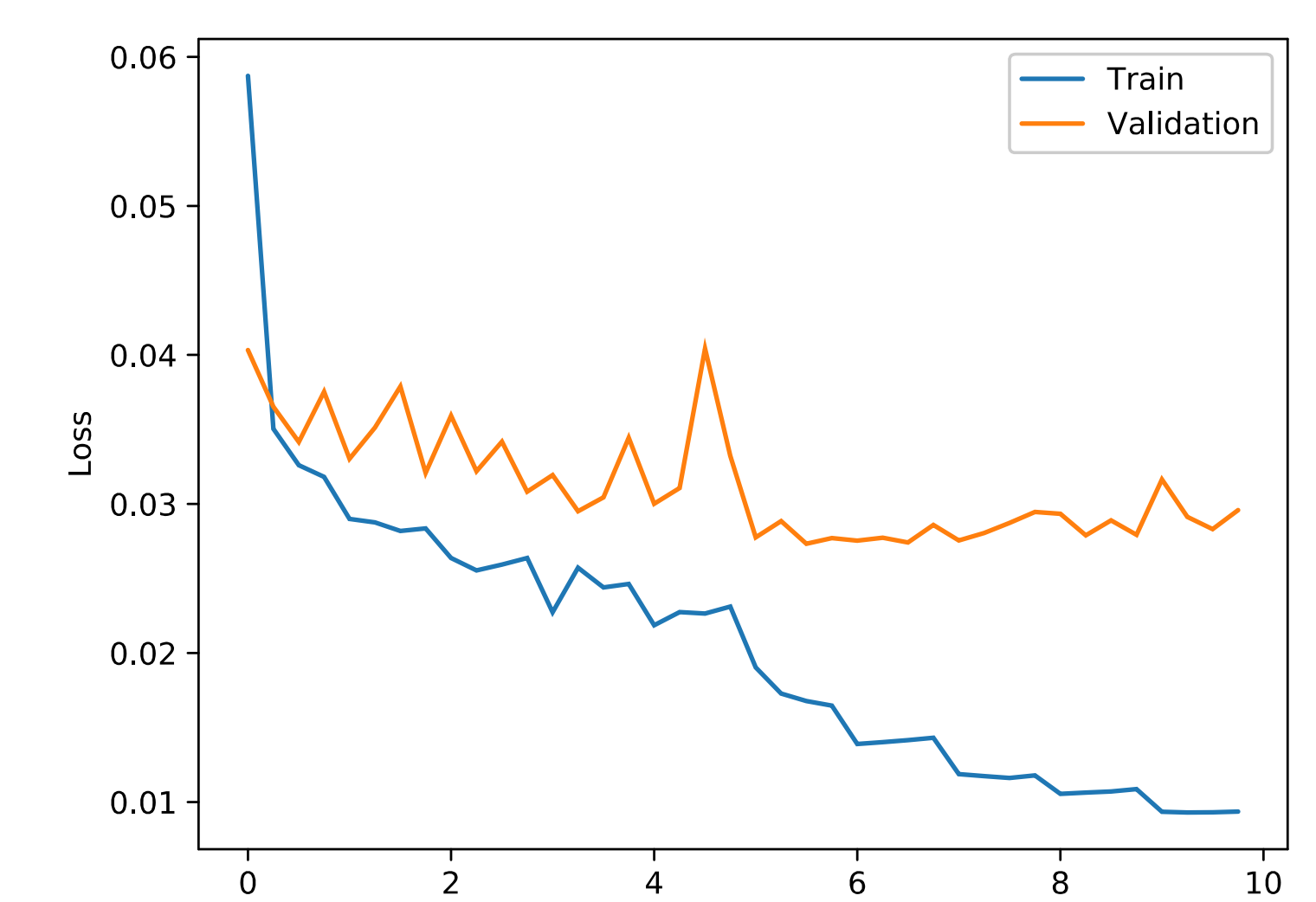
3. DLDL-v2

Label Distribution Learning (LDL) refers to the method that using model to learn an age distribution from a facial image. In this research, we follow the design of loss function in DLDL-v2, it consists two parts:

$$LOSS = \frac{L_{KLDiv} = \sum_{i \in K} d_i \ln \frac{d_i}{\hat{d}_i}}{L_{L1} = \lambda |\hat{y} - y|}$$

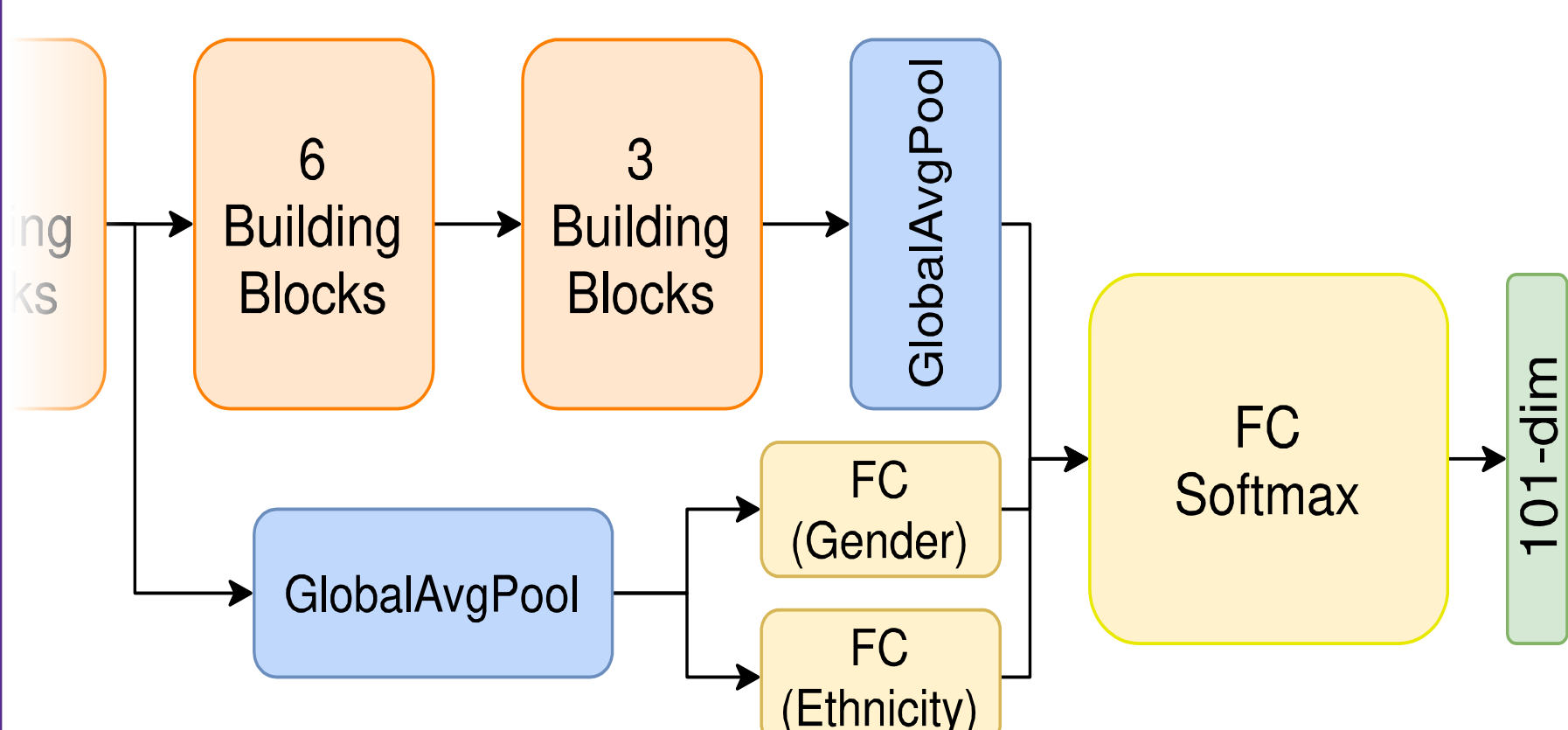


SE-ResNeXt without LDL



SE-ResNeXt with LDL

4. Multi-task Learning

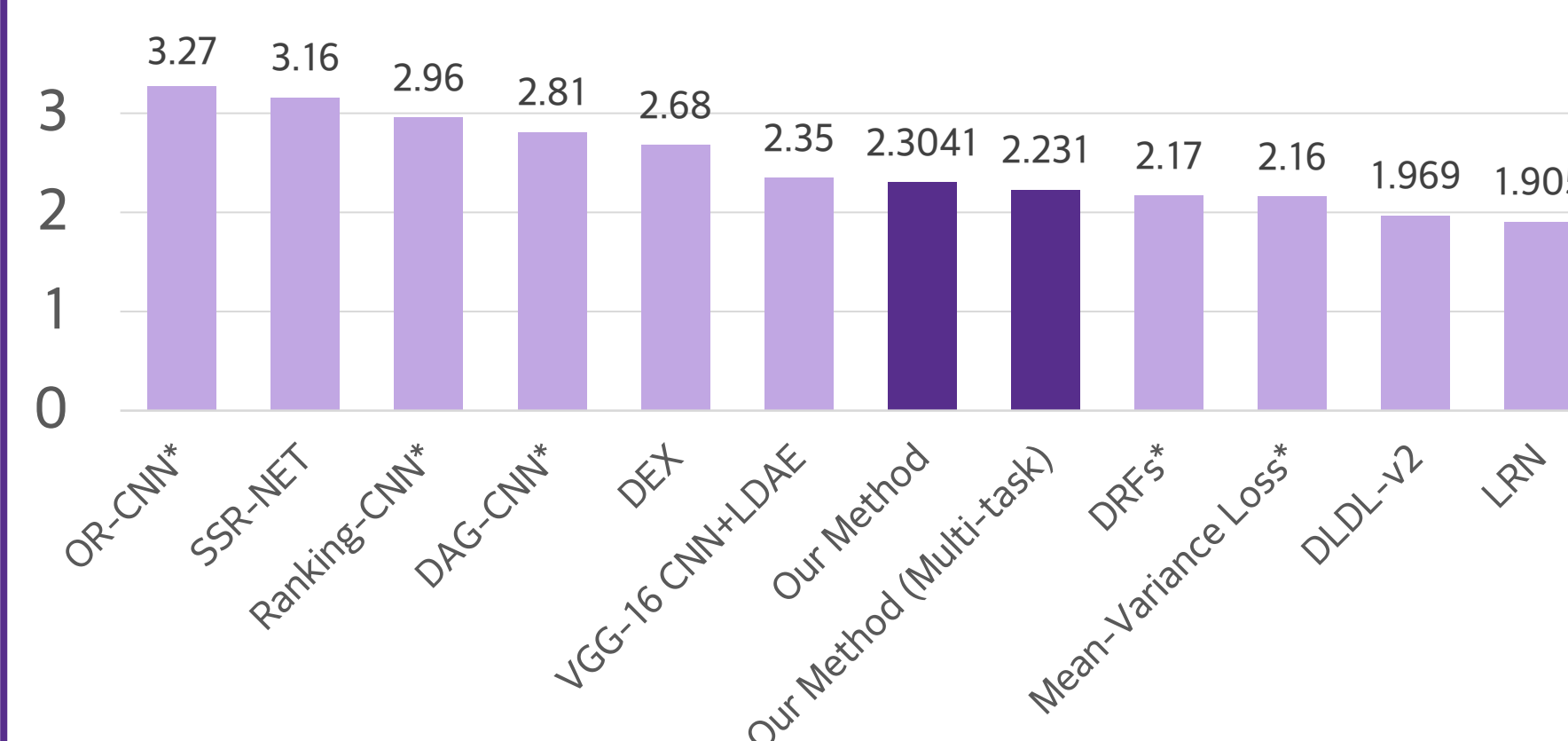


The multi-task learning model add another two fully connected layer for gender and ethnicity predication to the original architecture. The results are fed into the final FC layer to produce the age estimation. This improves the accuracy of estimation on MORPH dataset.



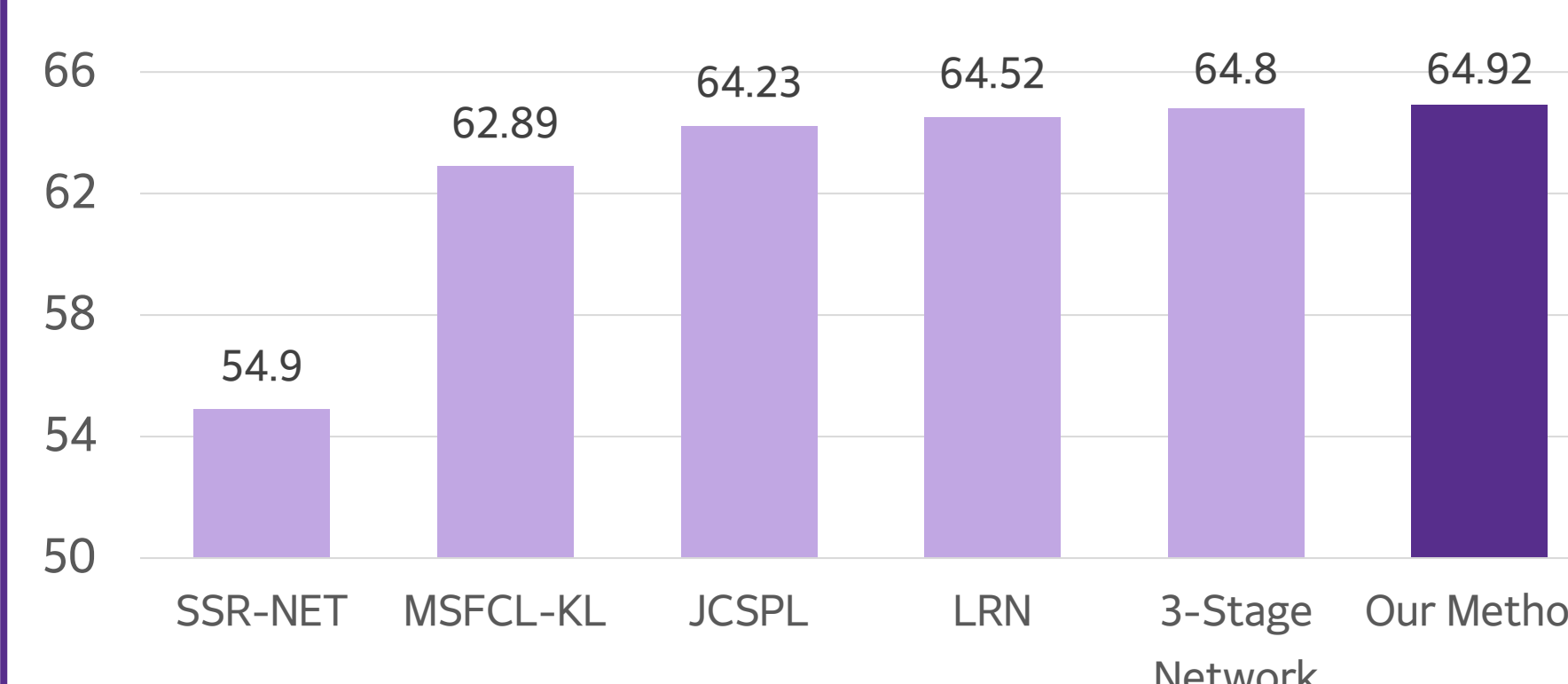
58 Male Caucasian
[..., 0.18, 0.20, 0.18, ...]
[0]
[0, 1, 0, 0, 0]

5. Comparison



MAE on MORPH dataset
(The lower the better)

(*: The evaluation protocol is slightly different)



CA(3) on MegaAge-Asian dataset
(The higher the better)

6. References

- B.-B. Gao, H.-Y. Zhou, J. Wu, and X. Geng, "Age estimation using expectation of label distribution learning," in *Proceedings of the 27th International Joint Conference on Artificial Intelligence (IJCAI 2018)*, 2018.
- R. Rothe, R. Timofte, and L. V. Gool, "Deep expectation of real and apparent age from a single image without facial landmarks," *International Journal of Computer Vision*, vol. 126, no. 2-4, pp. 144-157, 2018.
- G. Antipov, M. Baccouche, S.-A. Berrani, and J.-L. Dugelay, "Effective training of convolutional neural networks for face-based gender and age prediction," *Pattern Recognition*, vol. 72, pp. 15-26, 2017. [Online].
- J. Hu, L. Shen, and G. Sun, "Squeeze-and-excitation networks," 2018.

Please scan the QR-code for the paper and code

