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Face Frontalization

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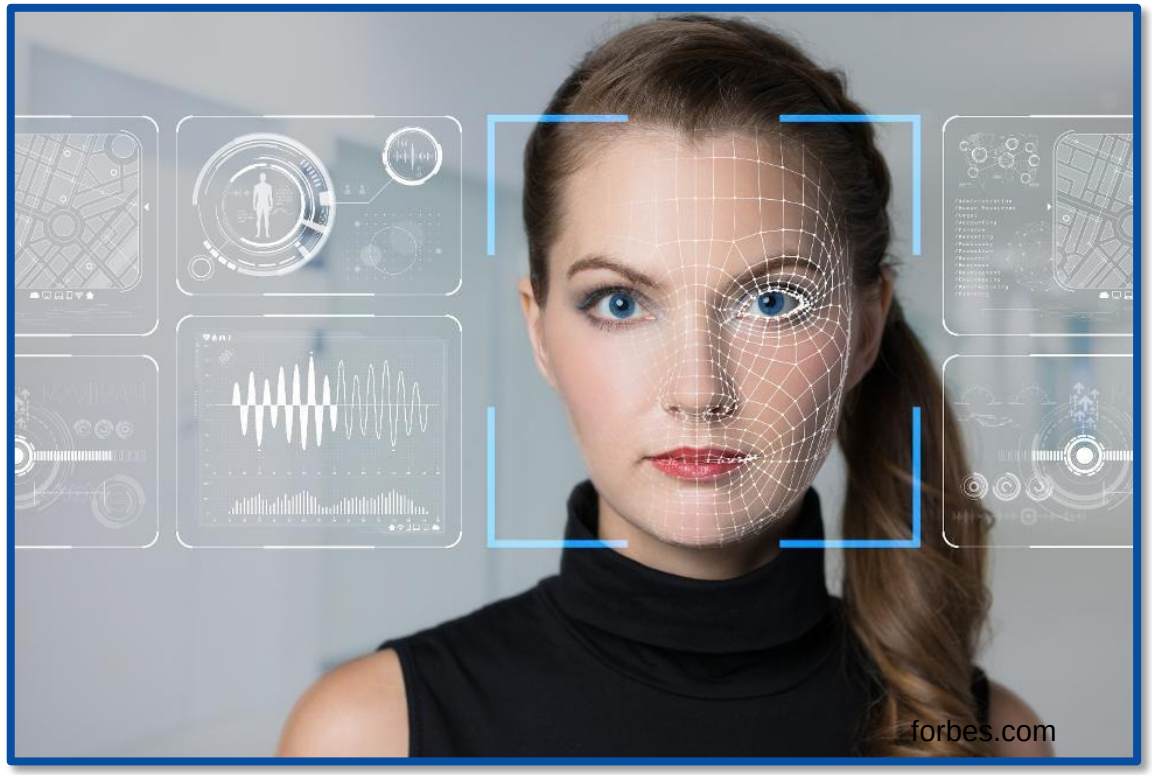
Problem Statement

I. Face recognition fails for large poses

II. Mobile secure environment (trust zone) can not support heavy computations and it has speed limitations

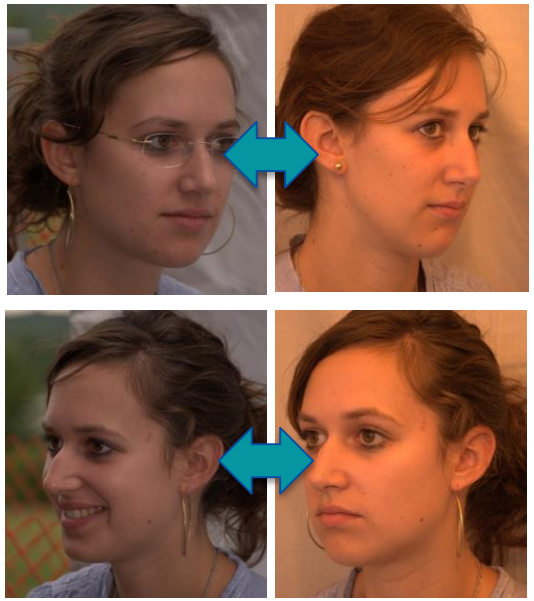


TRUST.ZONE

Solution

I. Match similar poses

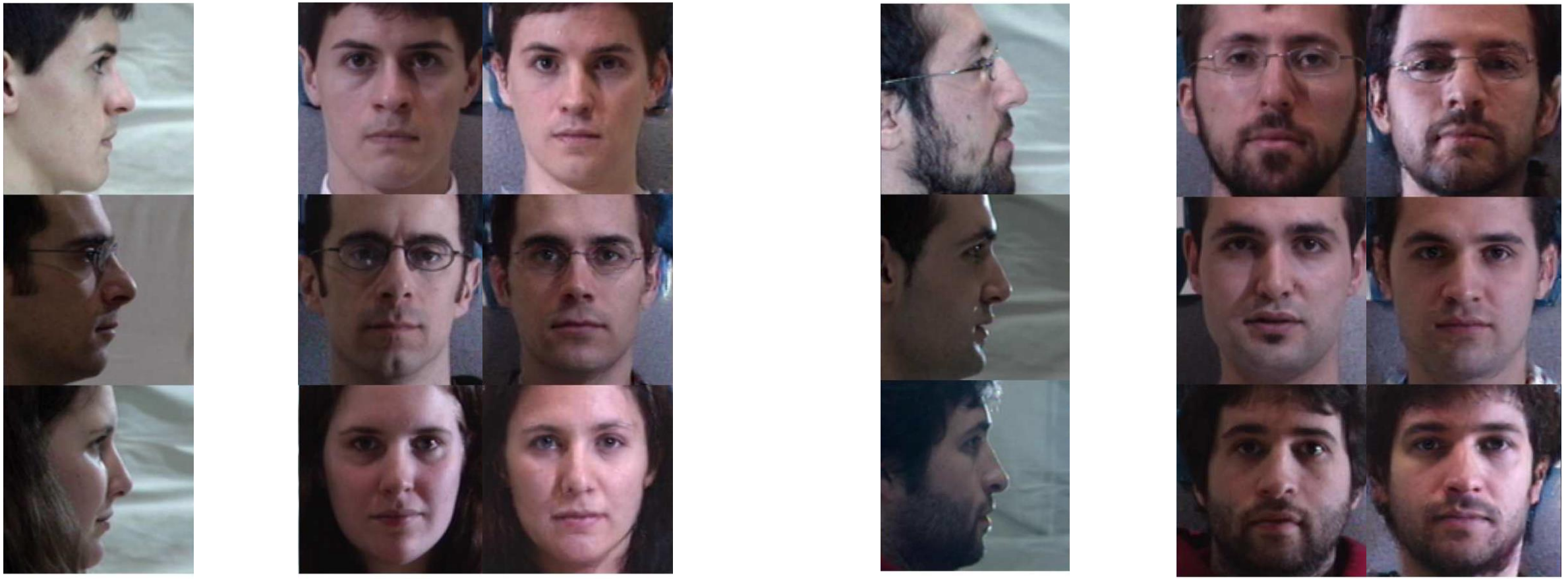
- Pose estimator is needed
- Hard to collect data
- Large databases => long training



II. Face Frontalization

- Recognition accuracy improvement
- Eliminates the need of several submodules (e.g. landmark detection, pose estimation)

Face Frontalization Examples



Guess which side is a generation result?

TPGAN (ICCV 2017)

Face Frontalization Examples

Original Generated

Original Generated

TPGAN (ICCV 2017)

Face Frontalization Examples

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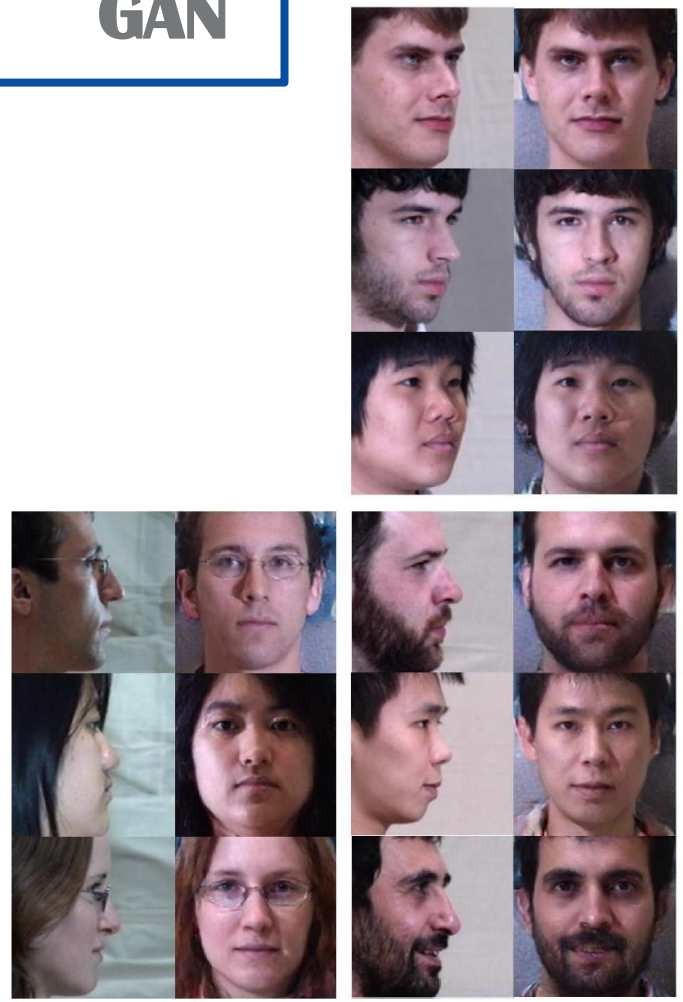
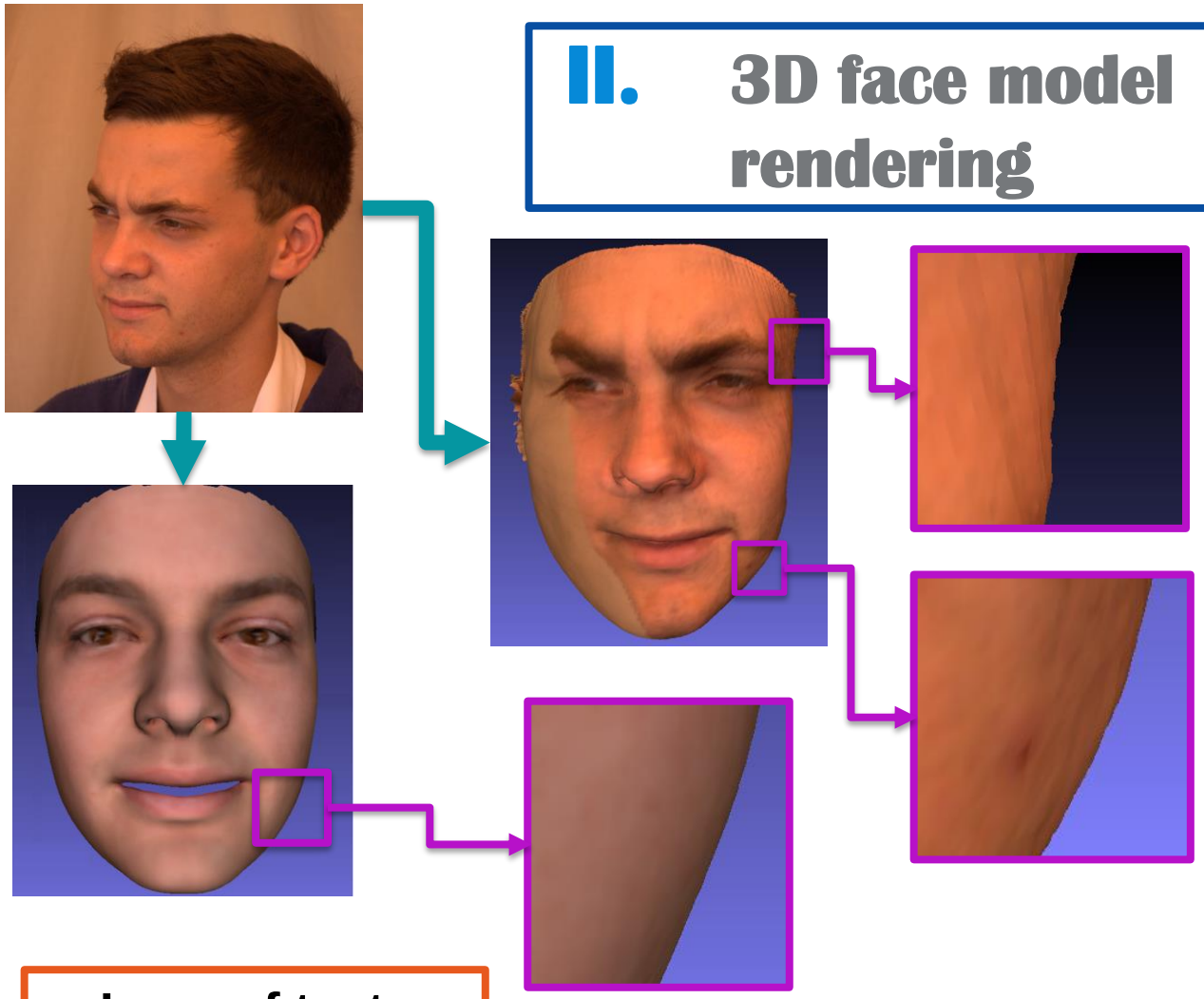
I. GAN



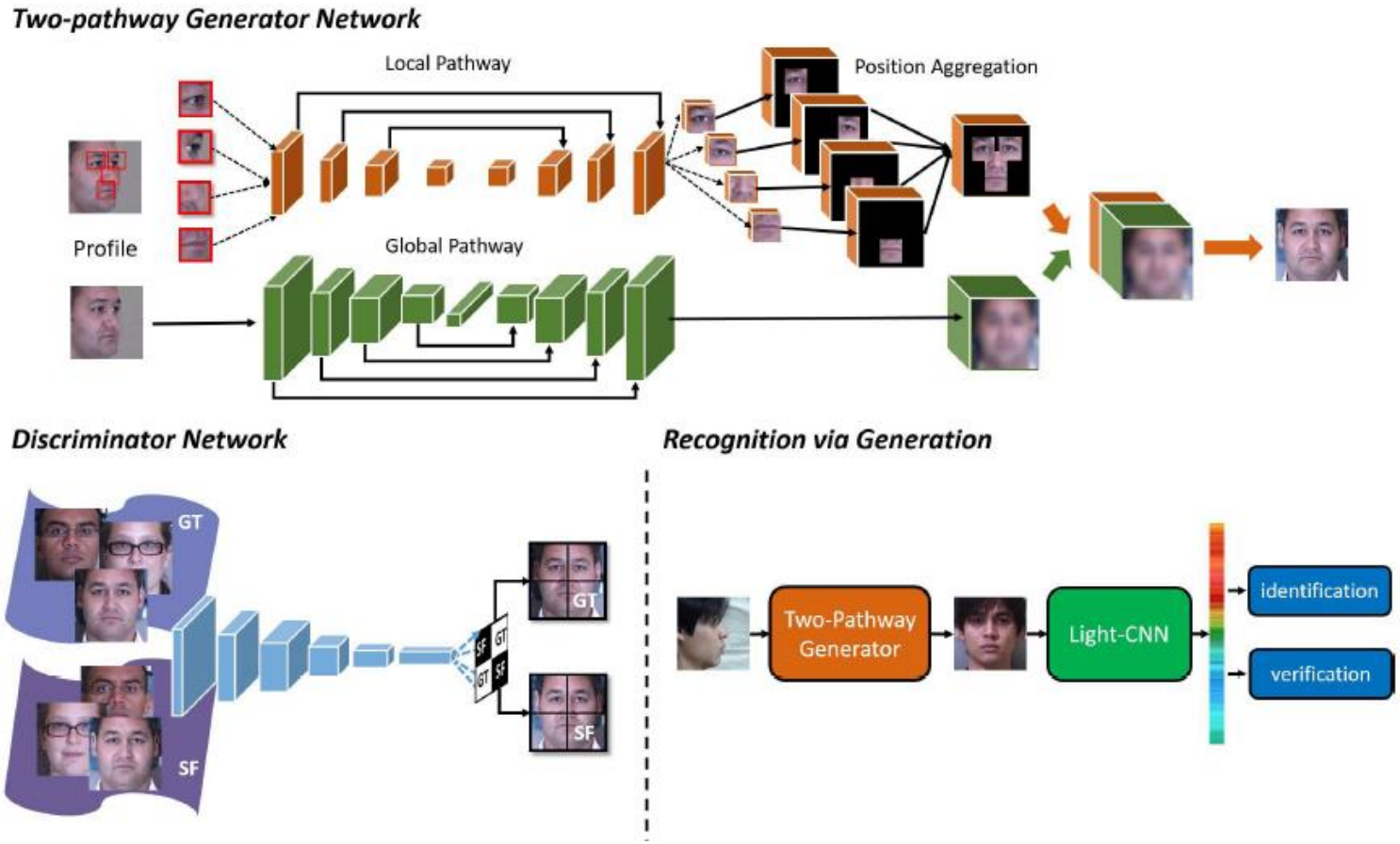
II. 3D face model rendering

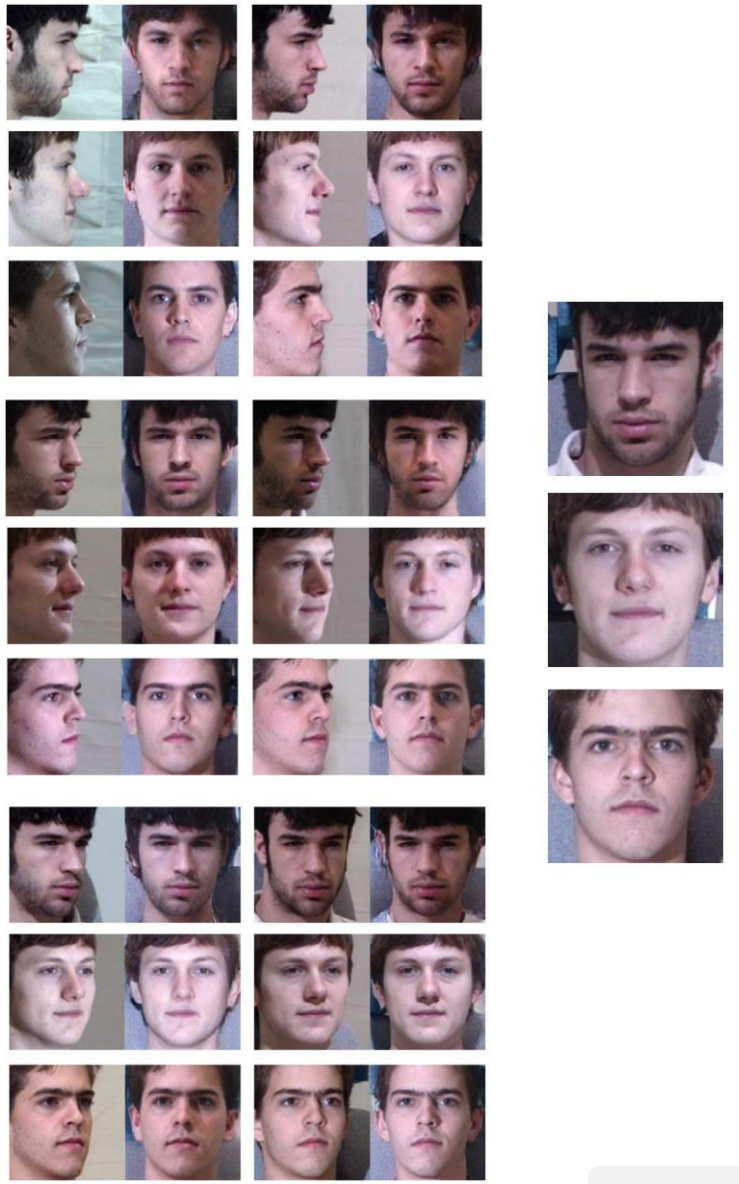


- Loss of texture
- Artifacts

Recent Solutions

I. TPGAN

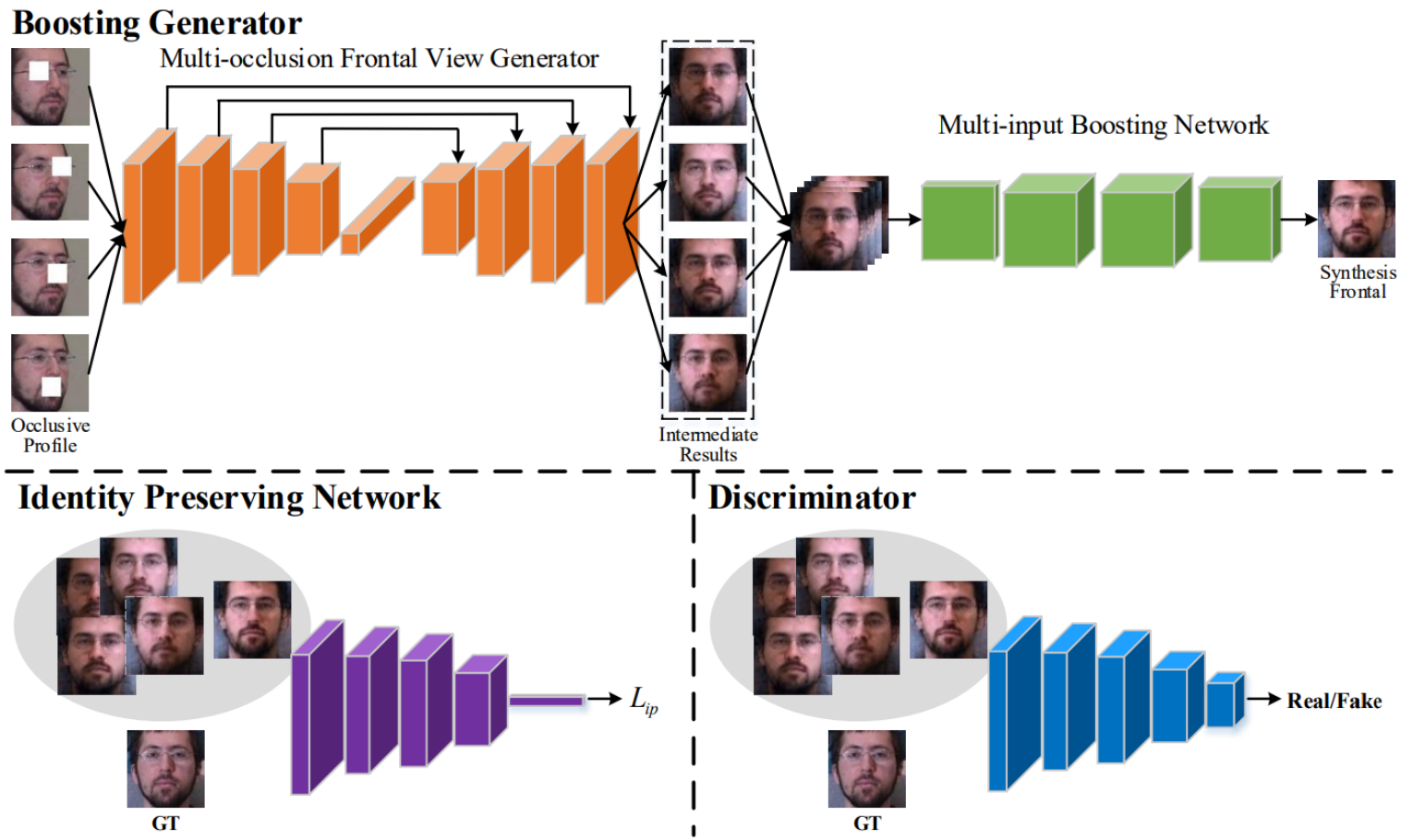


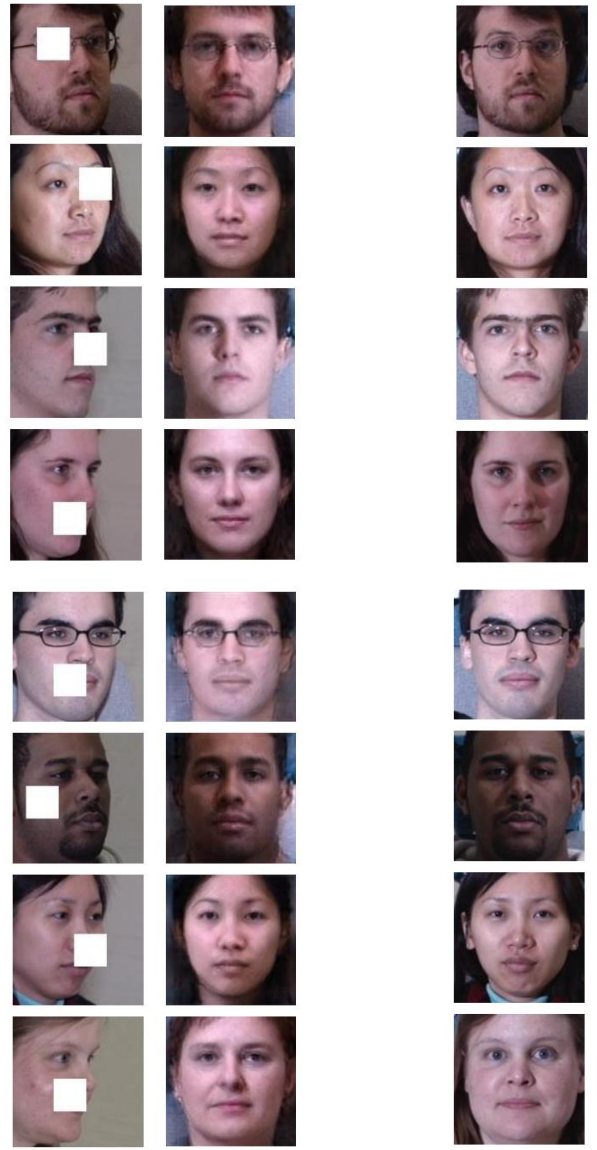


R.Huang, S. Zhang 2017

Recent Solutions

II. BoostGAN

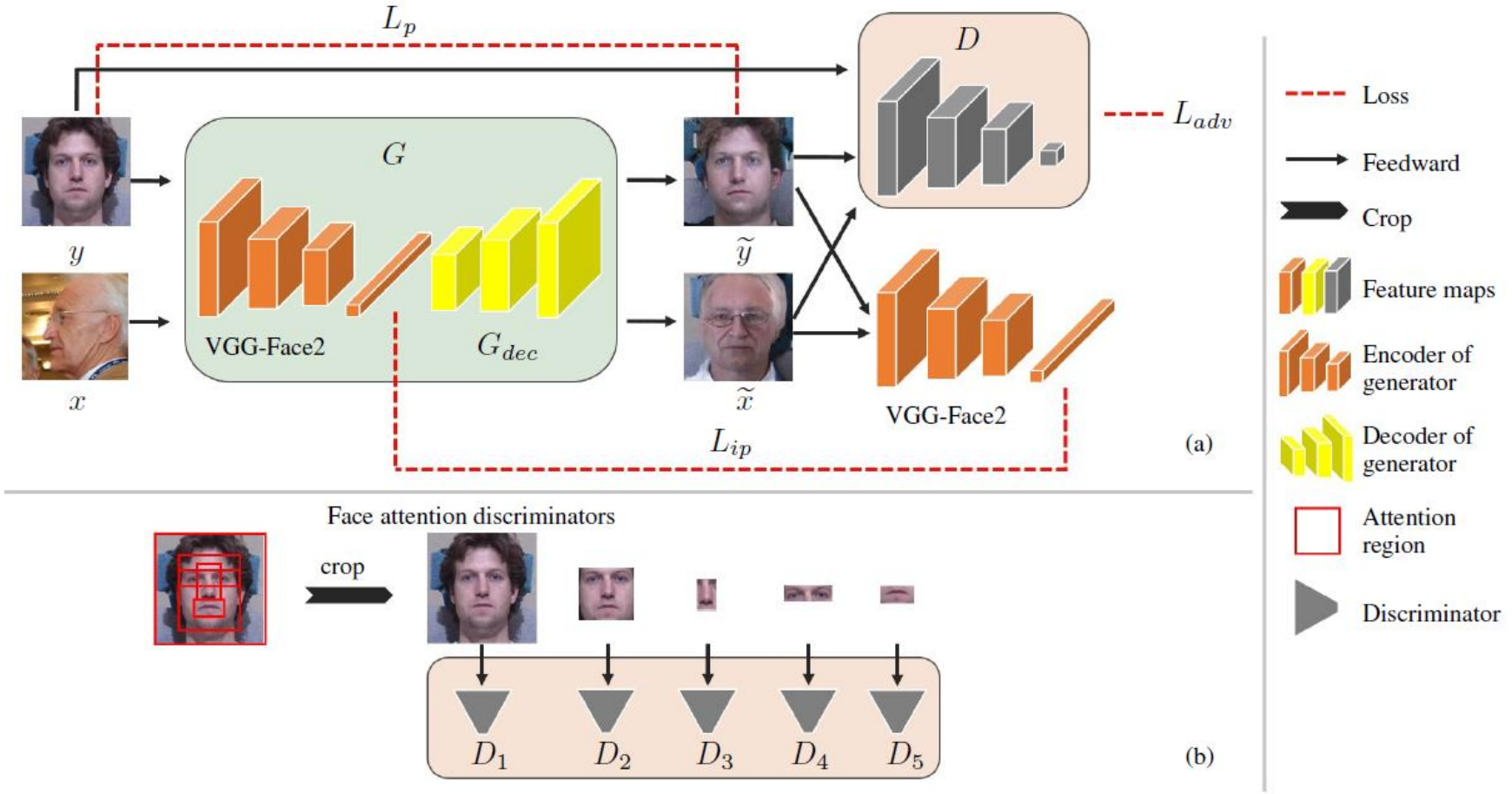


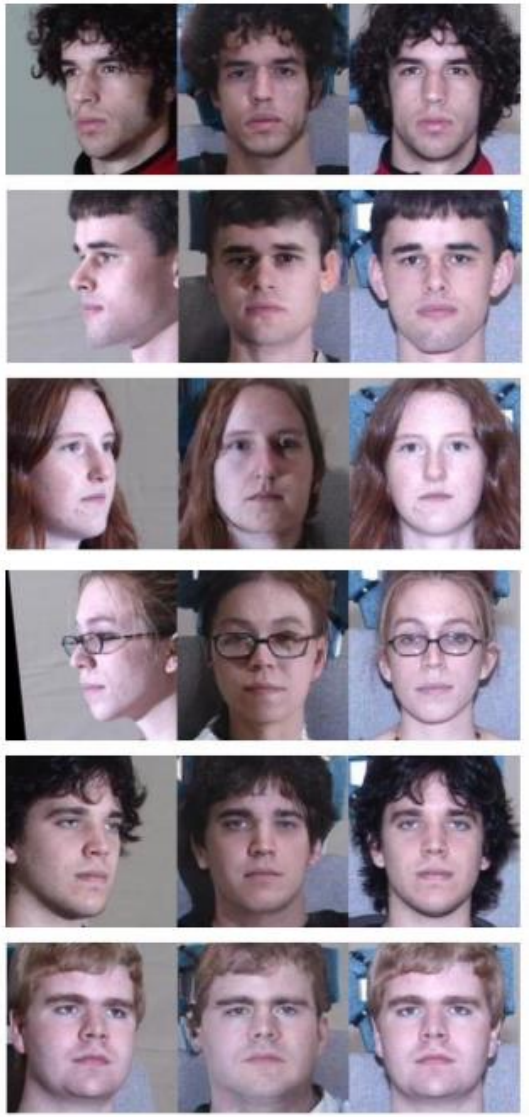


Q. Duan, L. Zhang 2019

Recent Solutions

III. FNM





Y. Qian, W. Deng 2019

Project Proposal

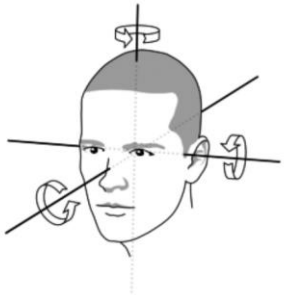
I. Review the literature concerning the existing face frontalization techniques

II. Prepare data for training/testing a frontalization model

III. Implement a face frontalization algorithm, train and test it

IV. Optimize and tune the resulting model

Restrictions:

Computational efficiency (suitability for mobile devices) 	Robustness to pose variations 
Robustness to different lighting conditions 	Robustness to glasses usage 

Contacts

Ask your questions or send your CV:

- Alena
  a.moskalenko@partner.samsung.com (Until October 14th)
- Vitaly
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THANK YOU

감사합니다

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