

Facial Expression Recognition By Using a Disentangled Identity-Invariant Expression Representation

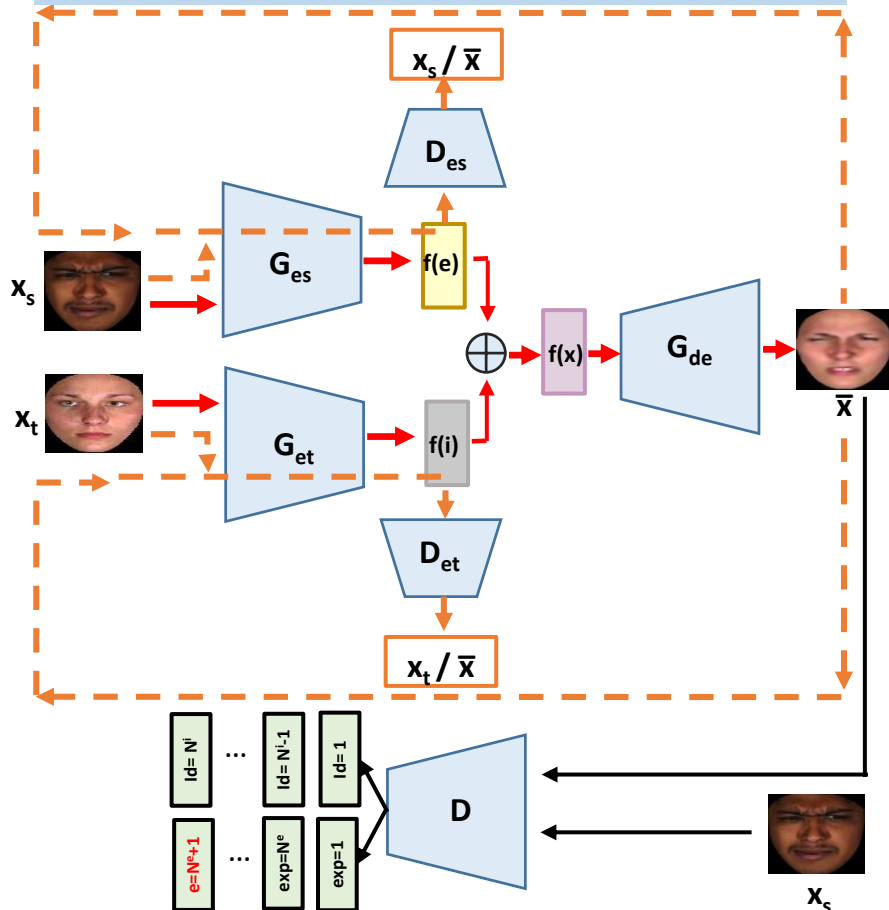
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Problem:

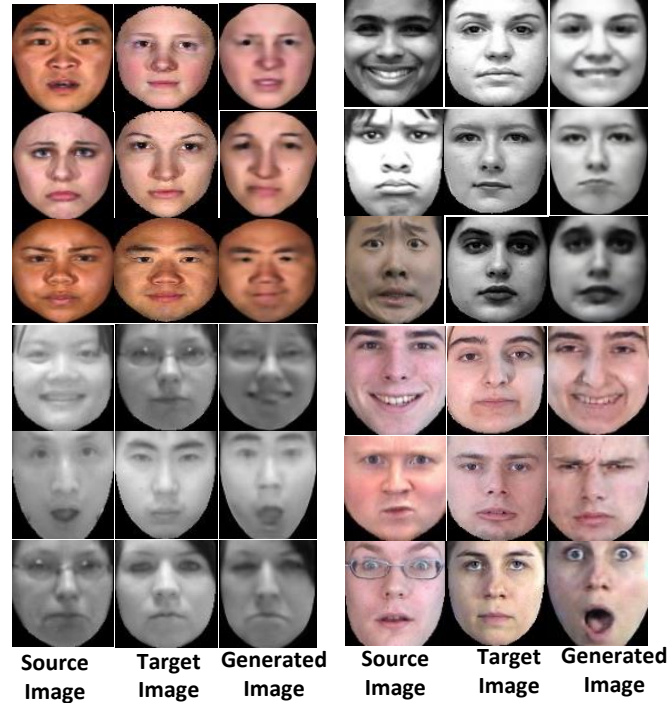
Learning optimal expression features

- By disentangling expression information from identity features
- Using an adversarial identity-invariant expression representation learning technique

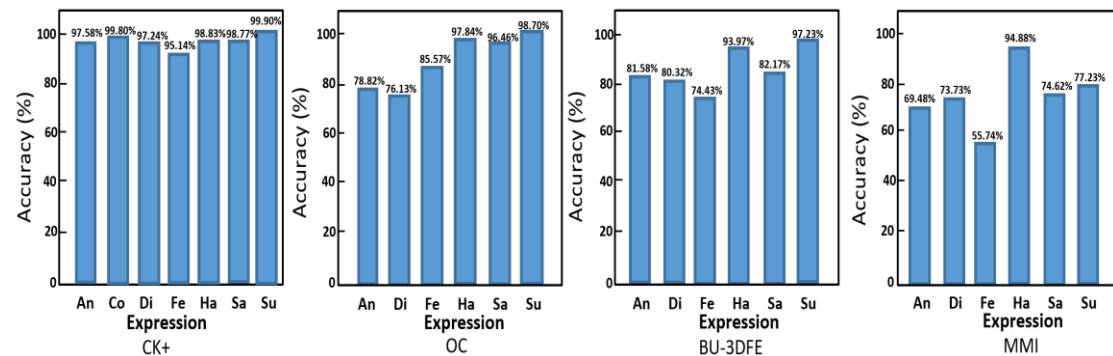
Overall Architecture of TER-GAN:



Expression Transfer Results:



Per class accuracy:



FER Result and comparison:

Method	Setting	Accuracy
STM-Explet[24]	Dynamic	94.19
STCAM[23]	Dynamic	99.08
IACNN[3]	Static	95.37
DeRL[5]	Static	97.30
CNN(baseline)	Static	91.64
TER-GAN without \mathcal{L}_{Des}	Static	94.93
TER-GAN(Ours)	Static	98.47

TABLE I
CK+: ACCURACY FOR SEVEN EXPRESSIONS CLASSIFICATION.

Method	Setting	Accuracy
STM-Explet[24]	Dynamic	74.59
STCAM[23]	Dynamic	91.25
PPDN[25]	Static	84.59
DeRL[5]	Static	88.0
CNN(baseline)	Static	73.14
TER-GAN without \mathcal{L}_{Des}	Static	82.74
TER-GAN(Ours)	Static	89.14

TABLE II
OULU-CASIA: ACCURACY FOR SIX EXPRESSIONS CLASSIFICATION.

Method	Setting	Accuracy
Berretti et al.[28]	3D	77.54
Yang et al.[27]	3D	84.80
Lo et al.[26]	2D image + 3D	86.32
DeRL[5]	Static	84.17
CNN(baseline)	Static	75.63
TER-GAN without \mathcal{L}_{Des}	Static	81.25
TER-GAN(Ours)	Static	84.83

TABLE III
BU-3DFE DATABASE: ACCURACY FOR SIX EXPRESSIONS CLASSIFICATION.

Method	Setting	Accuracy
STM-Explet[24]	Dynamic	75.12
STCAM[23]	Dynamic	82.21
IACNN[3]	Static	71.55
DeRL[5]	Static	73.23
CNN(baseline)	Static	60.37
TER-GAN without \mathcal{L}_{Des}	Static	67.81
TER-GAN(Ours)	Static	74.69

TABLE IV
MMI: ACCURACY FOR SIX EXPRESSIONS CLASSIFICATION.