# Identifying Missing Children: Face Age Progression via Deep Feature Aging

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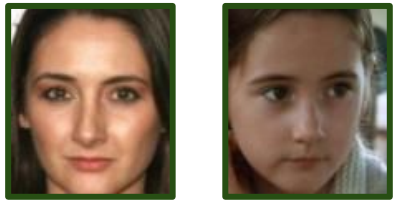
## Introduction

- **8 million children** go missing around the world every year
- Face is the primary biometric modality to trace missing children




**Match Score**
**0.33**
**(threshold=0.35)**

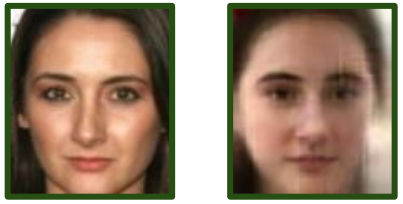
CosFace **FAILS** to match

**Hannah Taylor Gordon**

**Performance of Face Recognition systems degrade under large time lapses**

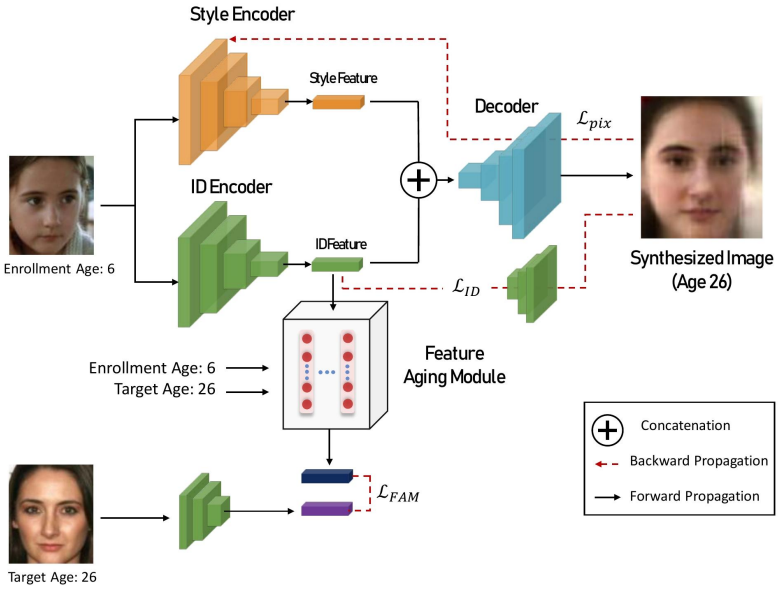
## Objective

- Develop an age progression method that can **improve cross-age performance of AFR systems**
- Can also **Synthesize realistic age progressed version** of the face




**Match Score**
**0.39**
**(threshold=0.35)**

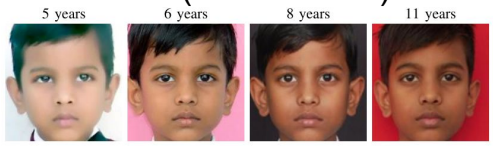
## Proposed Approach




- Directly aging face in the image space is hard
- Instead, **age the feature** in the face matcher's lower dimensional feature space
- Use the feature aging to guide aging in the image space

## Datasets

CFA (Constrained)

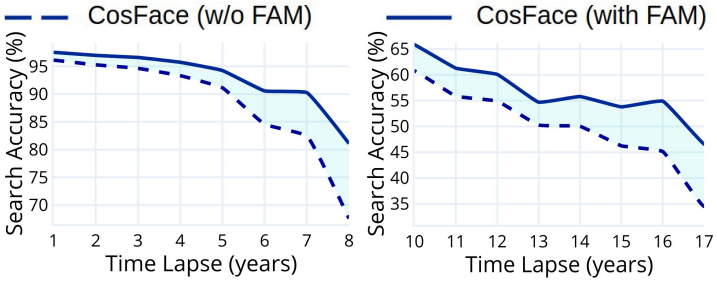



**25,180 images of 9,196 subjects**
Age Range : 2-18 years

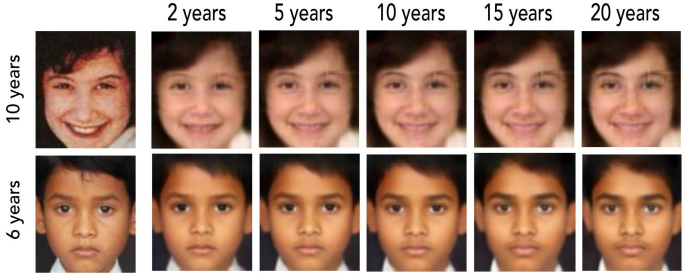
ITWCC (Semi-Constrained)


**7,990 images of 745 subjects**
Age Range : 0-32 years

## Experimental Results




**Rank-1 search accuracy for CosFace on CFA (left) and ITWCC (right) with and without the proposed Feature Aging Module (FAM)**




**Column 1 shows probe images of two children and columns 2-6 show the corresponding synthesized aged images via the proposed Image Generator**

- The proposed age progression method improves the rank-1 open-set identification accuracy of CosFace from **22.91% to 25.04% on ITWCC**
- Outperforms SOTA with Rank-1 identification rate of **95.91% and 99.58% on FG-NET and CACD-VS** respectively

## Conclusion

- Proposed an Age Progression framework to improve cross-age face recognition performance of any commodity face matcher
- Used aged features from Feature Aging Module to generate realistic age progressed face images