Plug & Play Attacks

Towards Robust and Flexible Model Inversion Attacks

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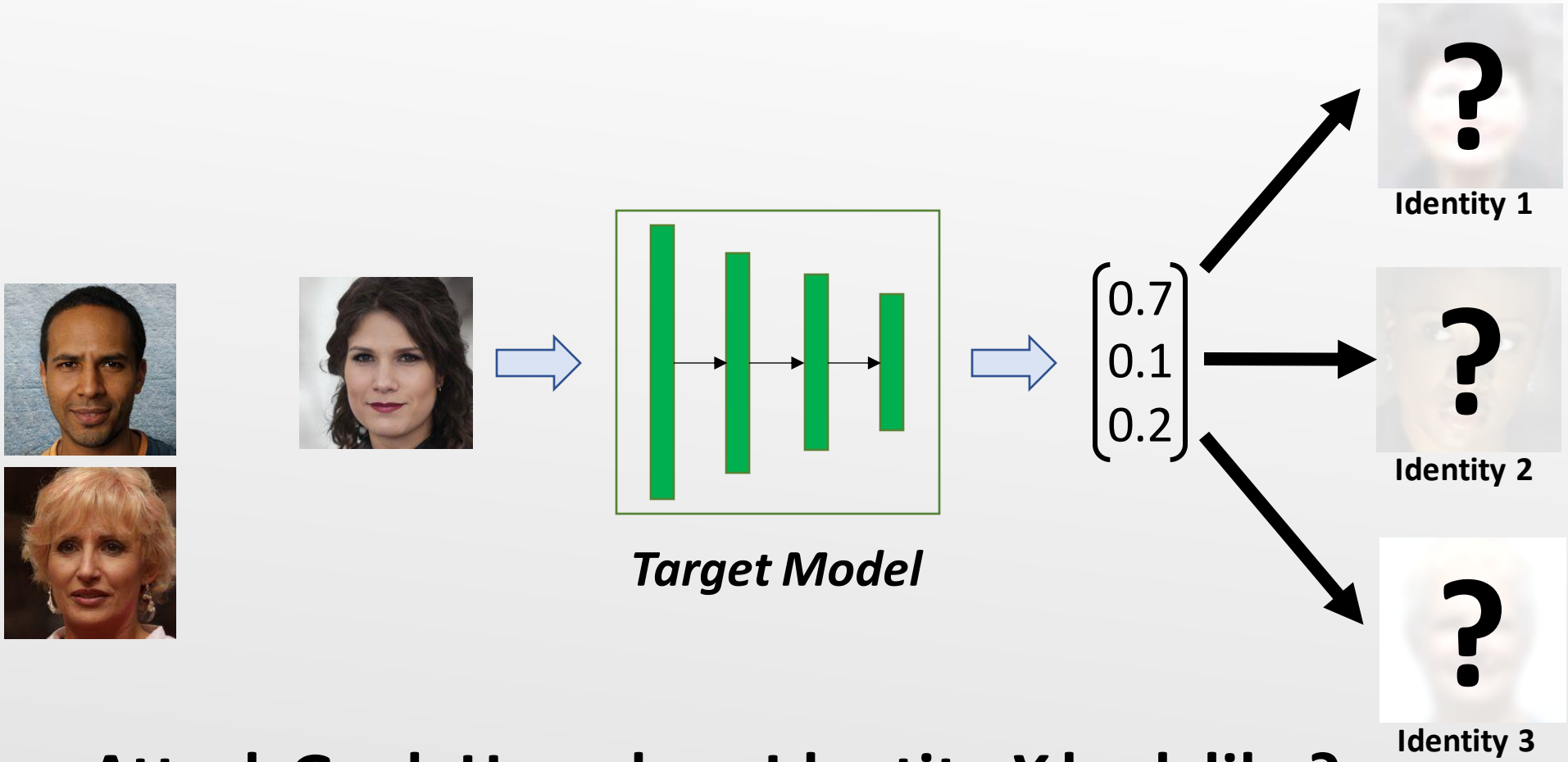
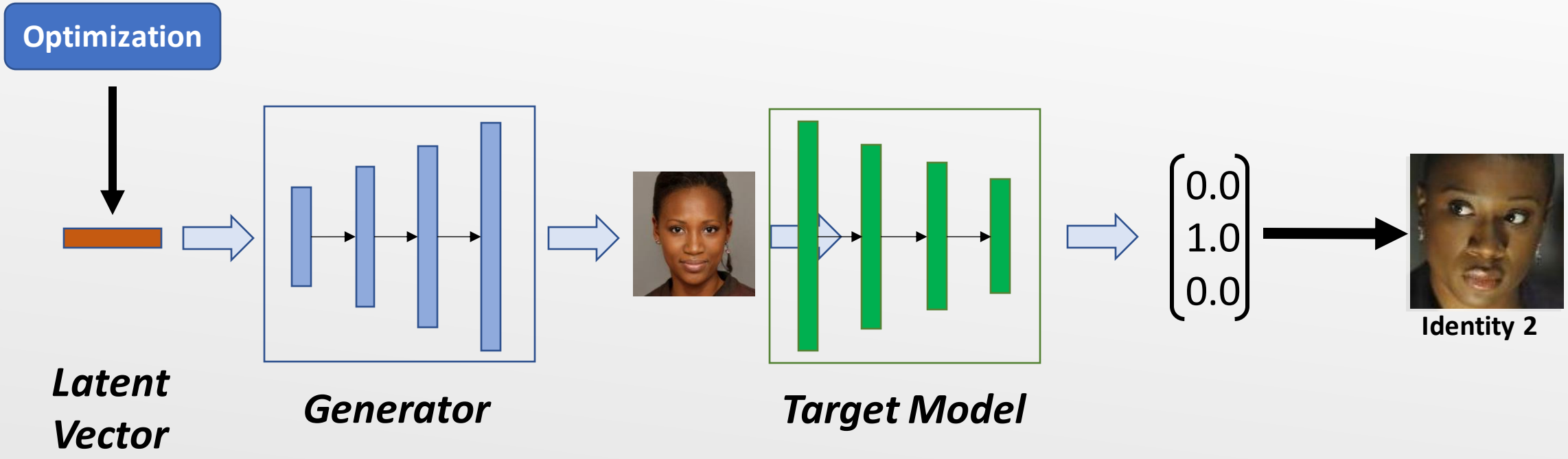
Deep Neural Networks are Changing the World – But there are Privacy Concerns



Attack Goal: How does Identity *X* look like?

(Generative) Model Inversion Attacks

Fredrikson et al. (CCS 2015); Zhang et al. (CVPR 2020)



Attack Goal: How does Identity *X* look like?

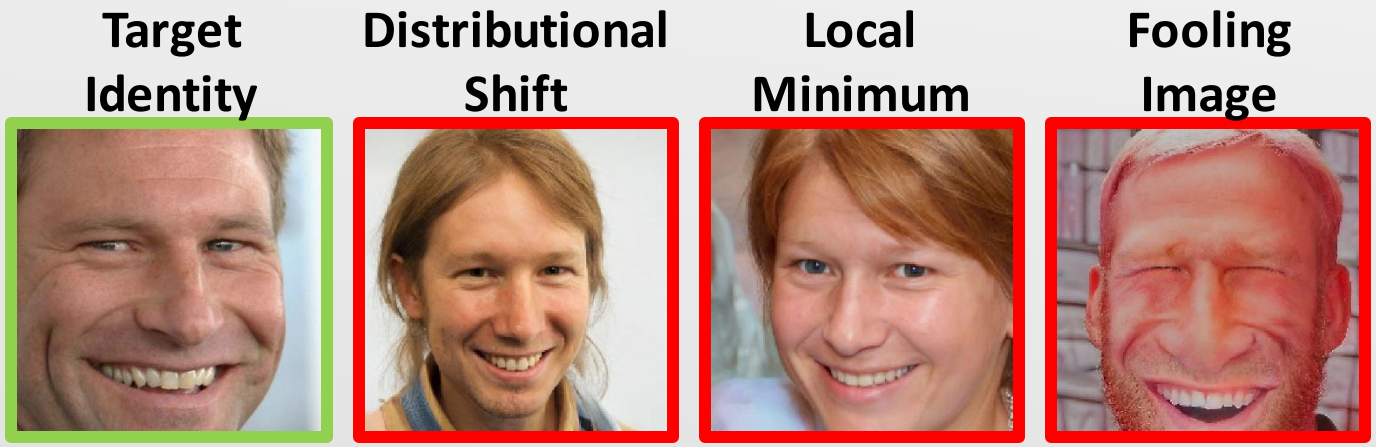
Model Inversion Attacks Face Several Challenges

Degradation Factors

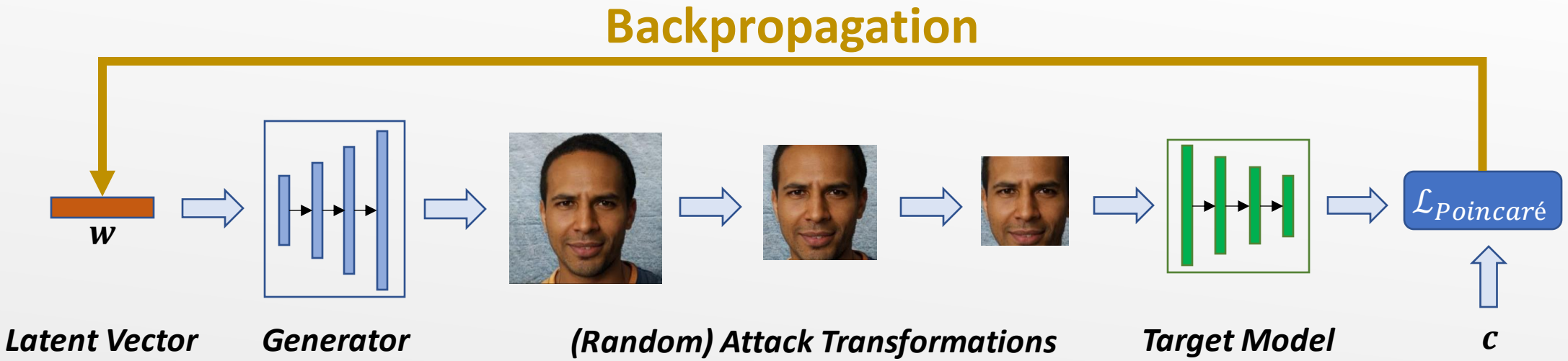
- Distributional Shifts
- Complex Optimization Landscape
- Fooling Images

Limitations of Previous MIAs

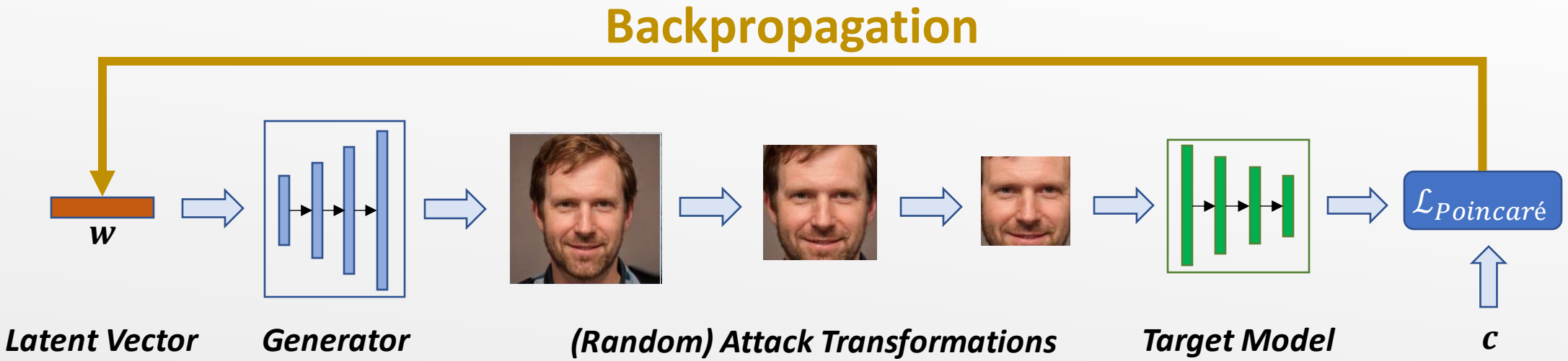
- Tailored on single target
- Time and resource intensive
- Additional input information required



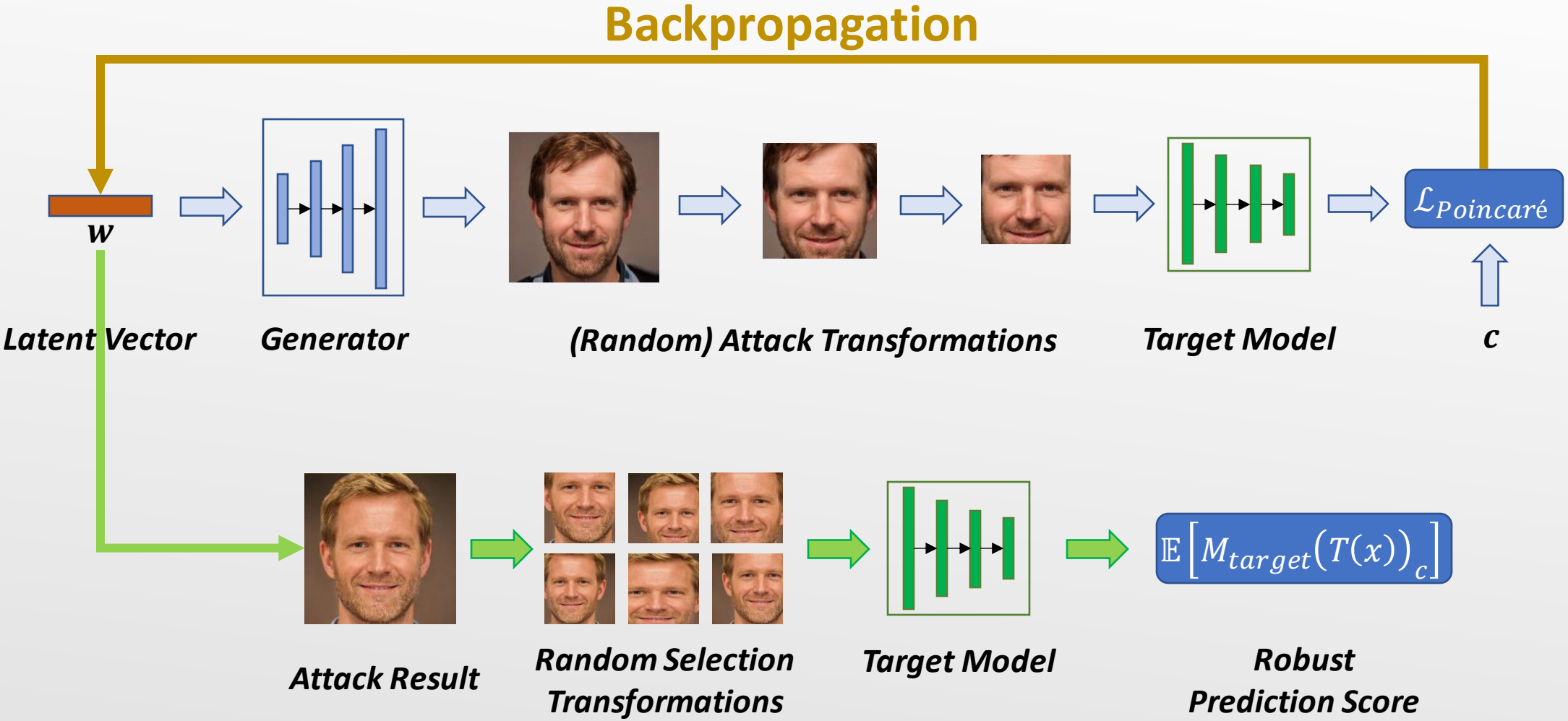
Robust & Flexible Model Inversion Attacks



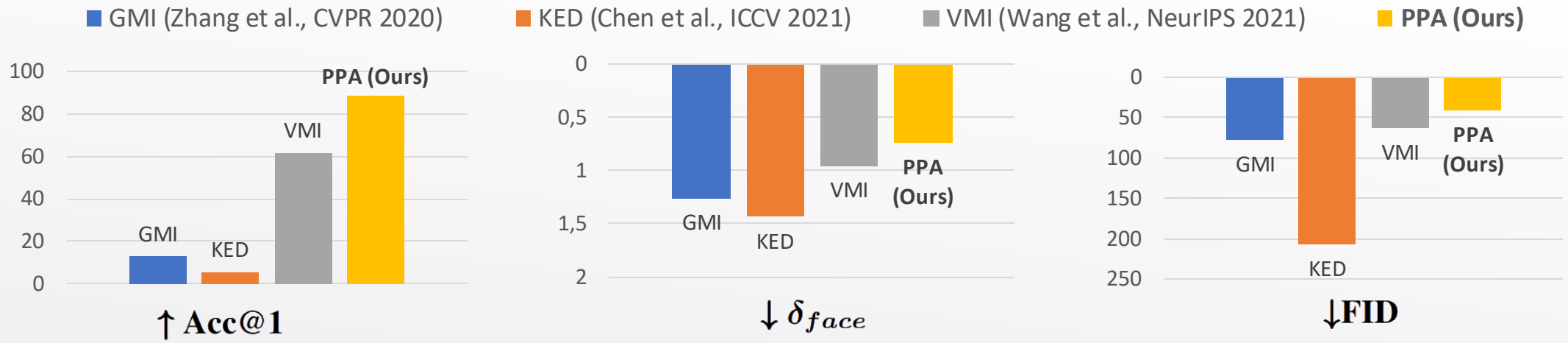
Robust & Flexible Model Inversion Attacks

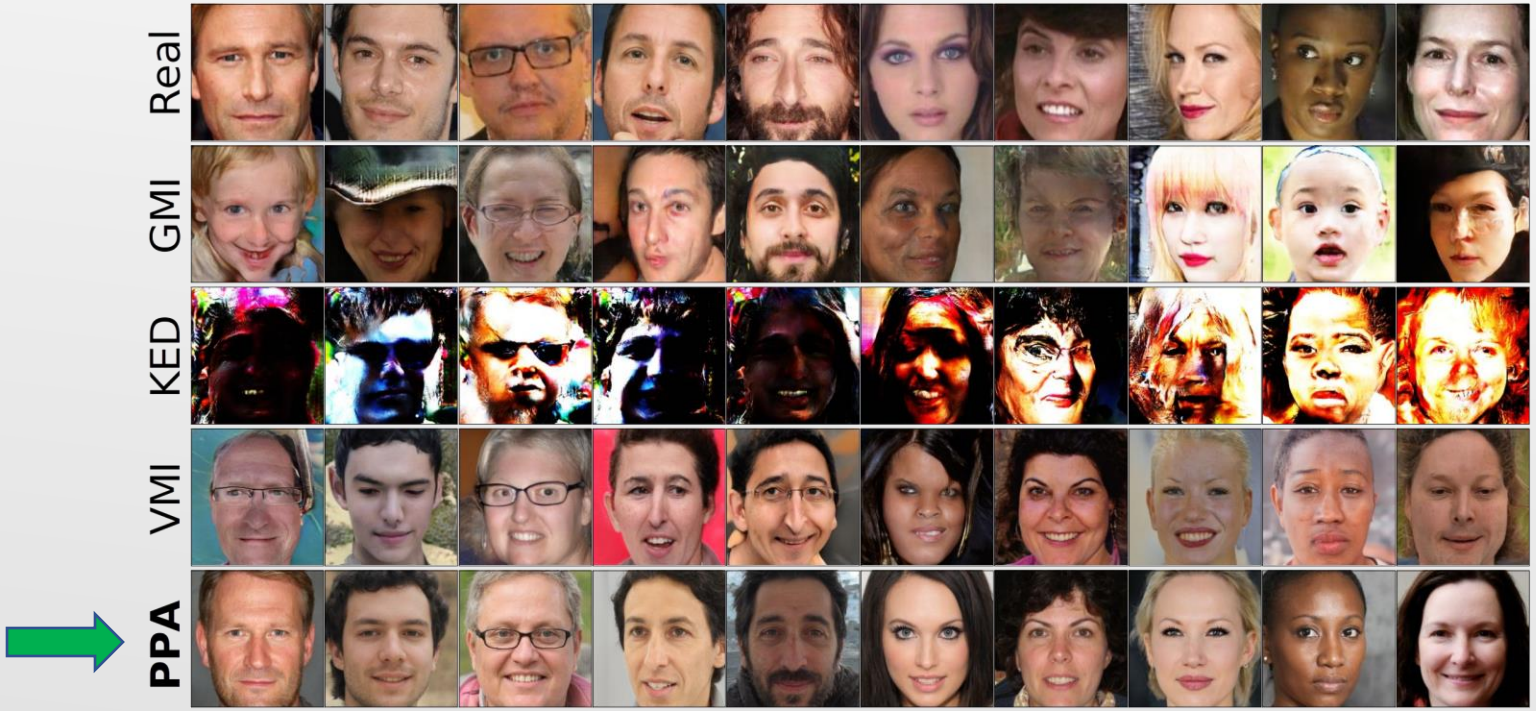


Robust & Flexible Model Inversion Attacks

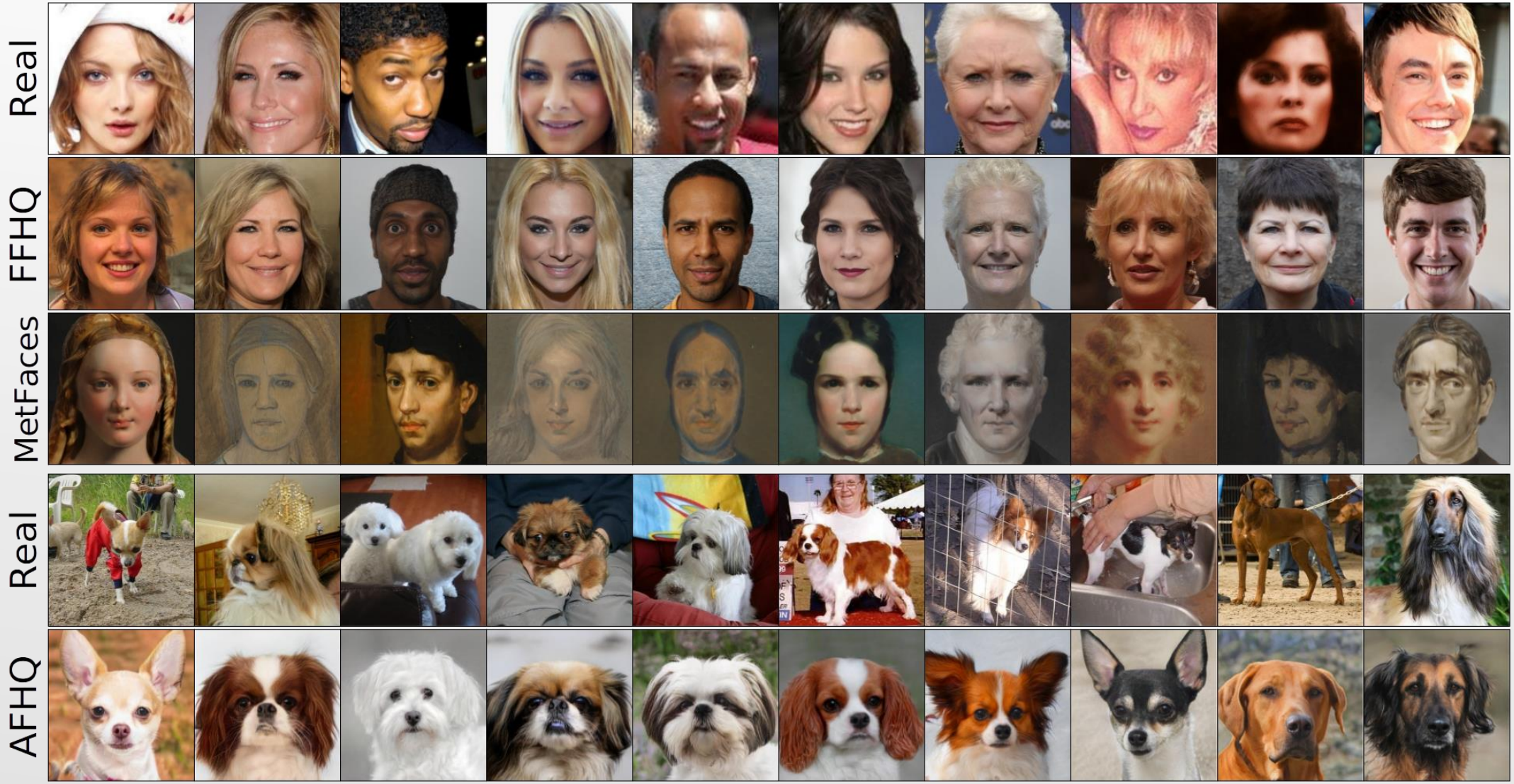


Plug & Play Attacks Outperform Previous Attacks





Plug & Play Attacks Overcome Distributional Shifts



The First Plug & Play Model Inversion Attack

Robust attack optimization

- Random transformations stabilize attacks
- Poincaré loss avoids vanishing gradients
- Selection process filters out poor attack outcomes

Flexible exchange of models

- Usage of pre-trained GANs possible
- Attack is independent of a specific target model

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Code:
https://github.com/LukasStruppek/Plug-and-Play-Attacks