



# **Dressing in Order:** **Recurrent Person Image Generation for** **Pose Transfer, Virtual Try-On and Outfit Editing**

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# *Dressing in Order* for Multiple Tasks

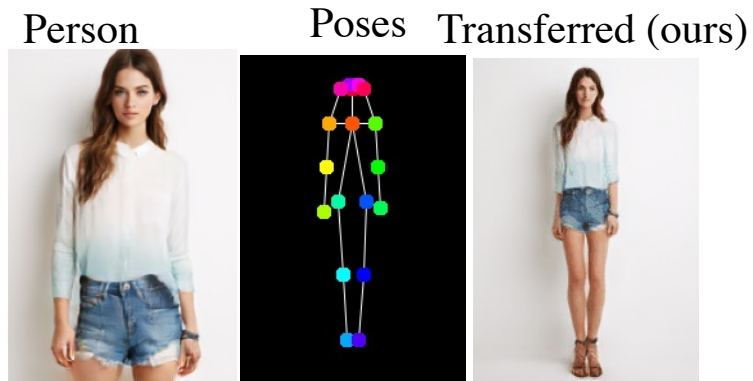
- Virtual try-on: **multiple layouts** and **multiple layers**



# *Dressing in Order* for Multiple Tasks

- Virtual try-on: **multiple layouts** and **multiple layers**
- Pose Transfer
- Outfit Editing

## Pose transfer



## Content Removal



## Print Insertion



## Reshaping



## Texture Transfer



# Background: Virtual Try-On

- **Outfit Try-On: Garment Replacement**

- Predefine a set of garment categories (e.g., top, bottom, skirts, etc)



(ADGAN, Y. Men et al. CVPR 2020)



## Limitations:

- Only accept one garment per category  $\Rightarrow$  **No layering**
- Only generate one layout per set of garments  $\Rightarrow$  **Users can't control layout**

# *Background:* Pose Transfer

- Transfer a person from pose A to pose B, while keeping the identity

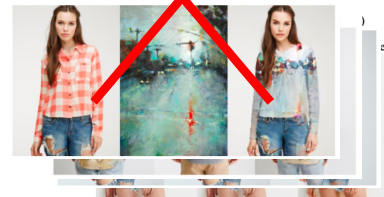


*(GFLA, Y. Ren et al. CVPR 2020)*

Any form of virtual try-on

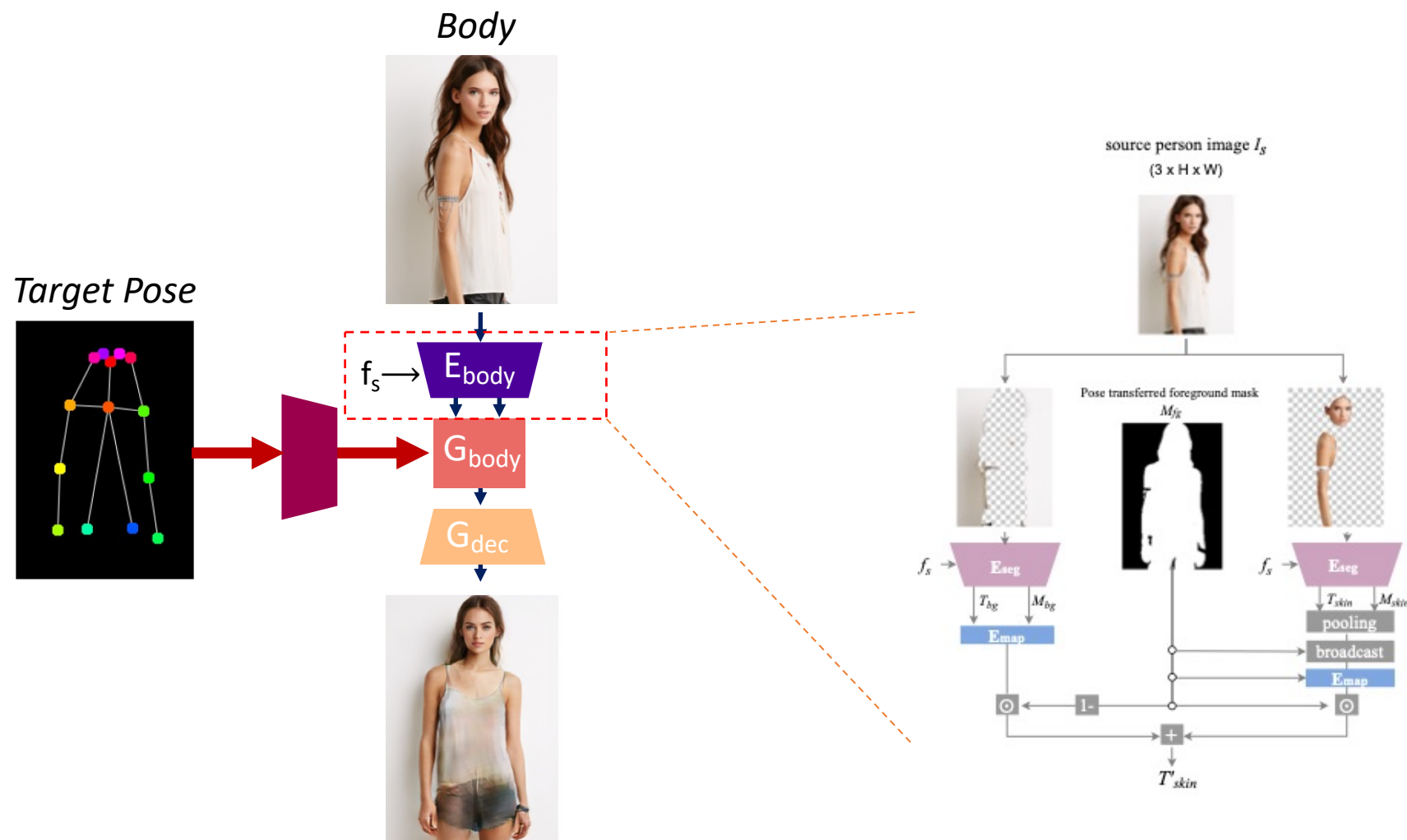


Editing



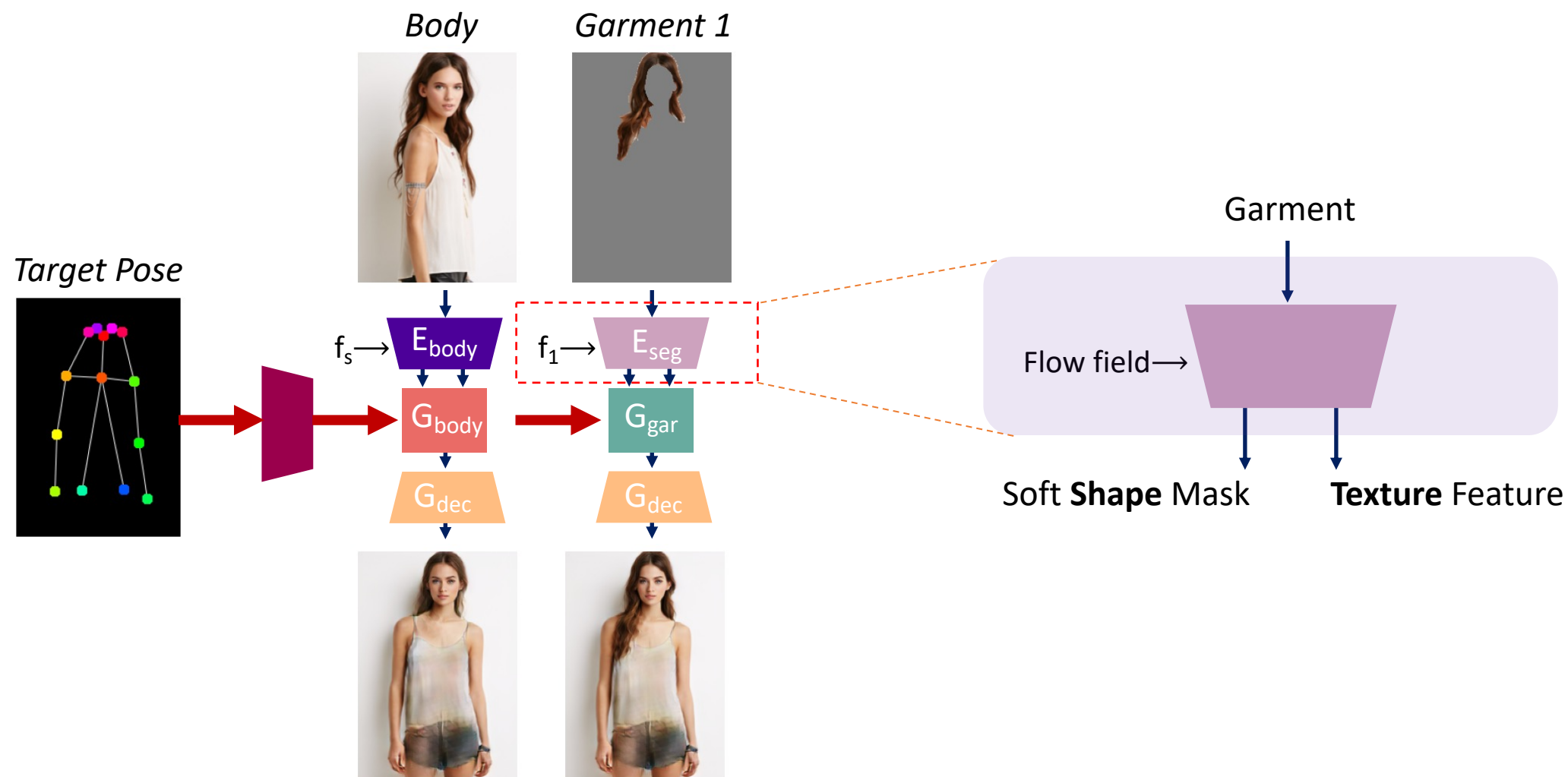
# *Dressing in Order*: A Recurrent Pipeline

- A recurrent mechanism for layering garments



# *Dressing in Order*: A Recurrent Pipeline

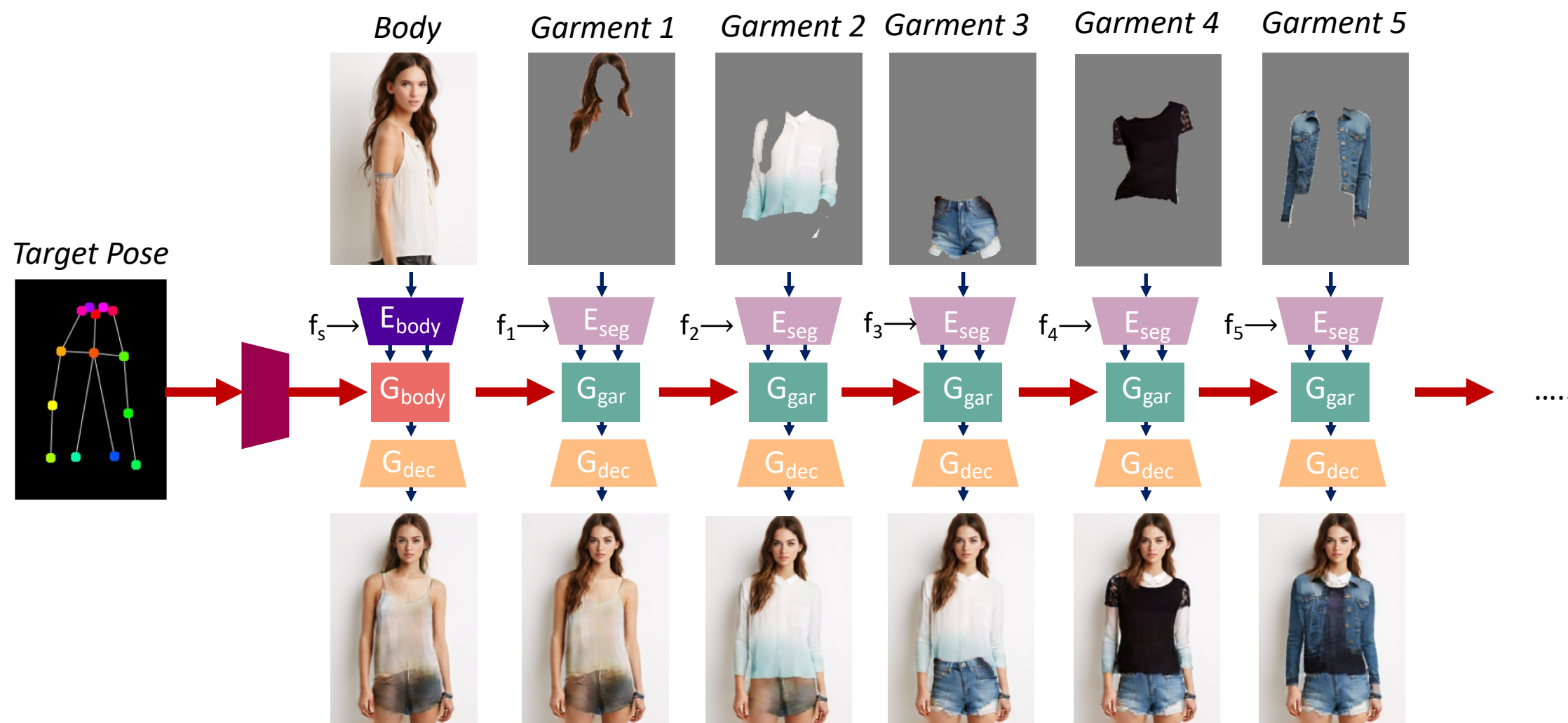
- A recurrent mechanism for layering garments





# *Dressing in Order*: A Recurrent Pipeline

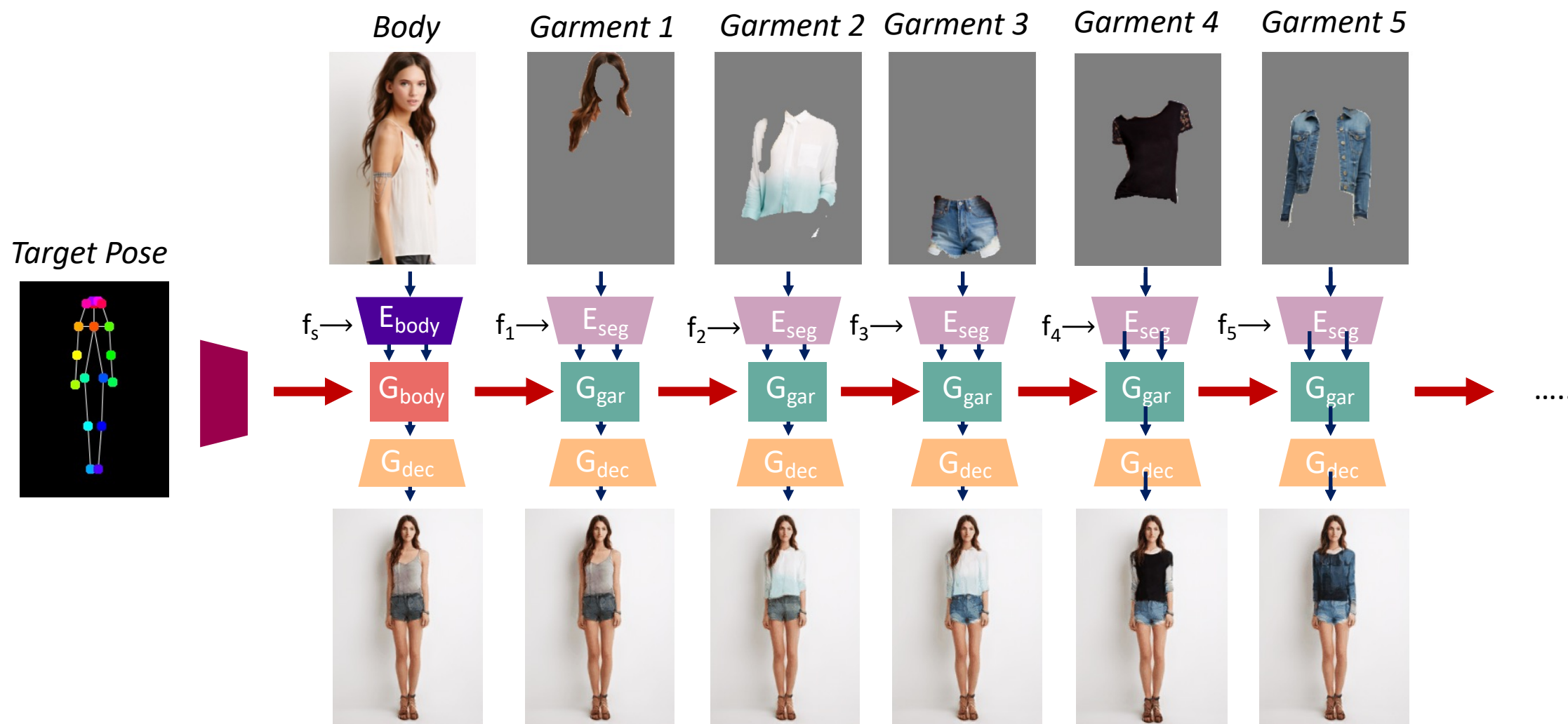
- A recurrent mechanism for layering garments





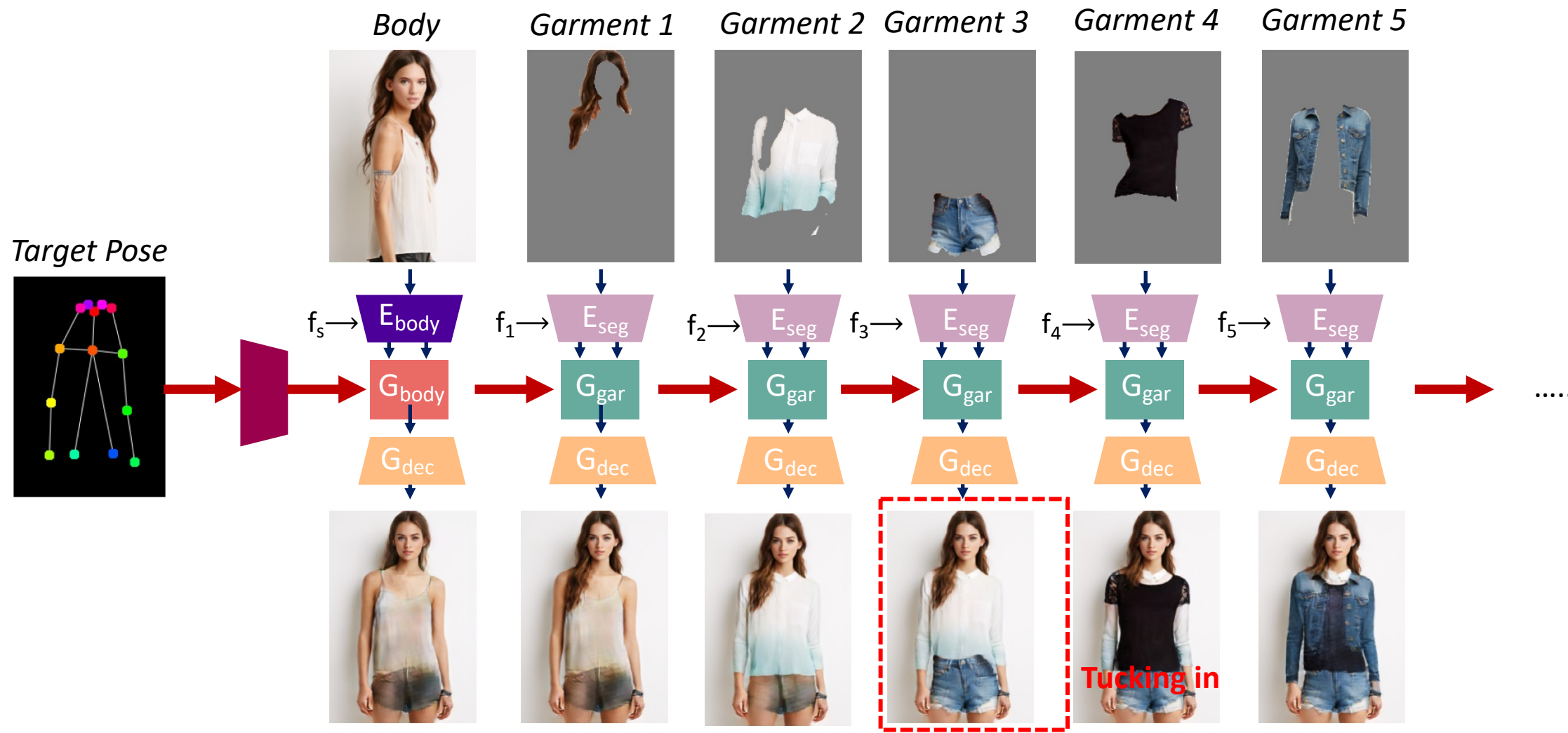
# *Dressing in Order* for Pose Transfer

- Transfer pose by control pose input



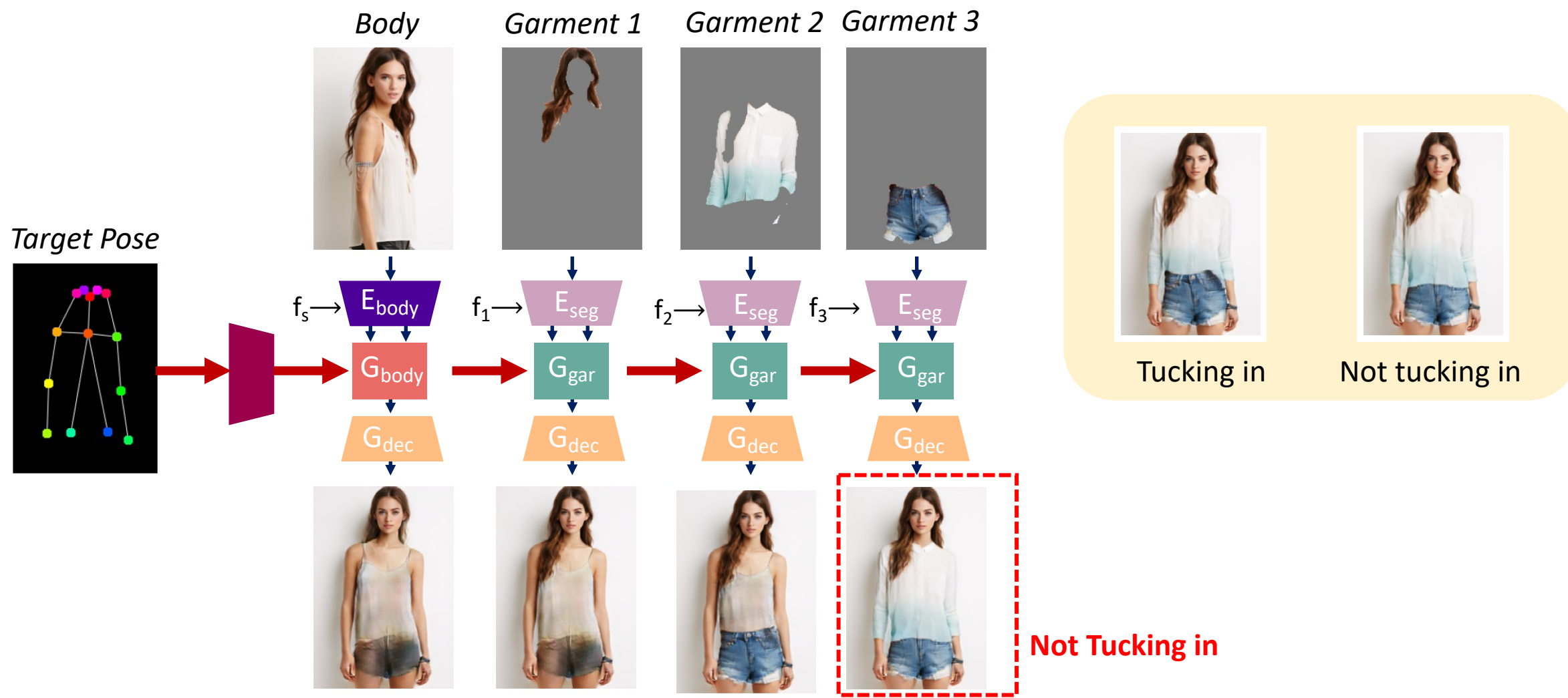
# *Dressing in Order*: A Recurrent Pipeline

- A recurrent mechanism for layering and switching dressing order



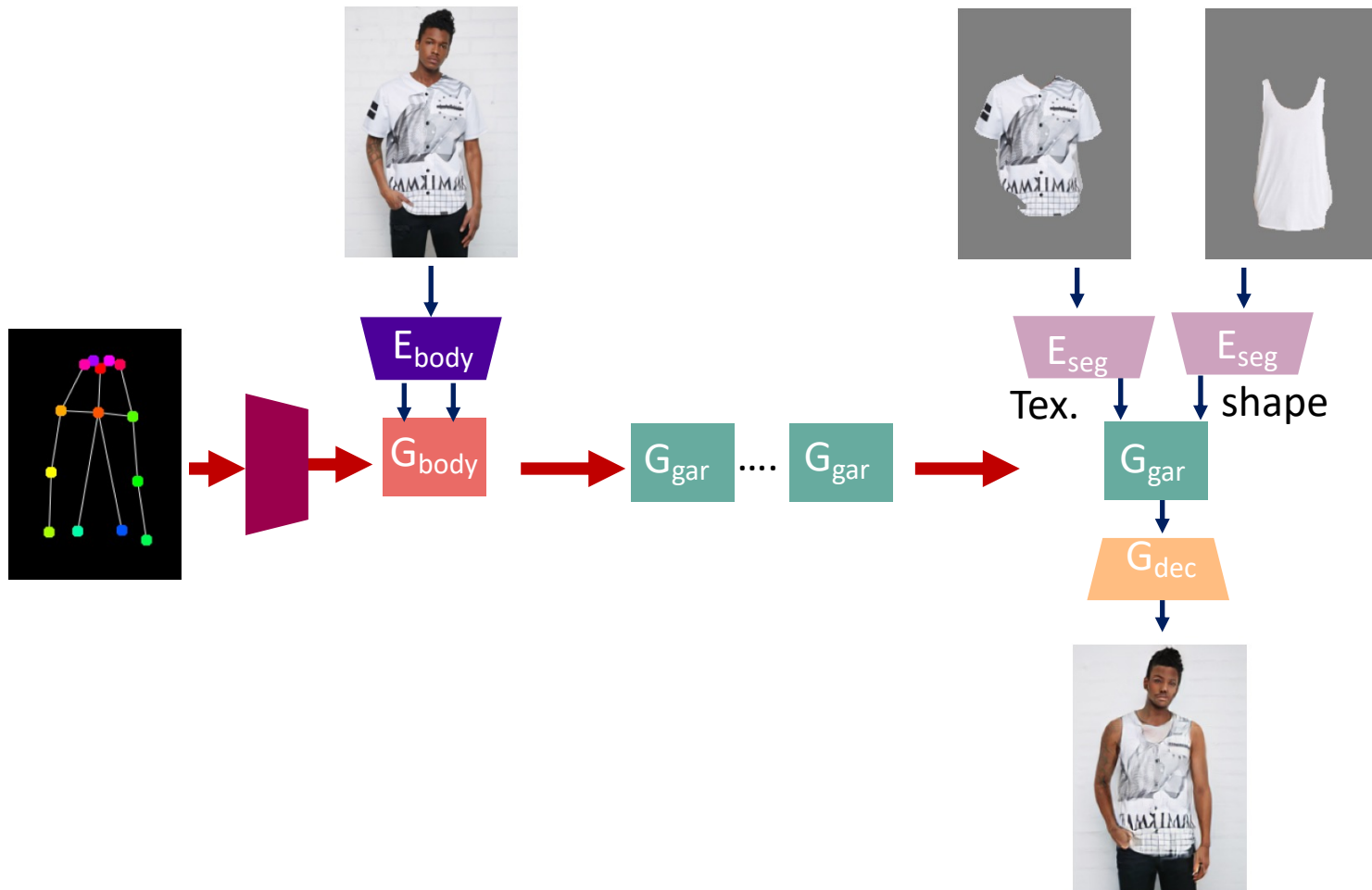
# *Dressing in Order*: A Recurrent Pipeline

- A recurrent mechanism for layering and switching dressing order



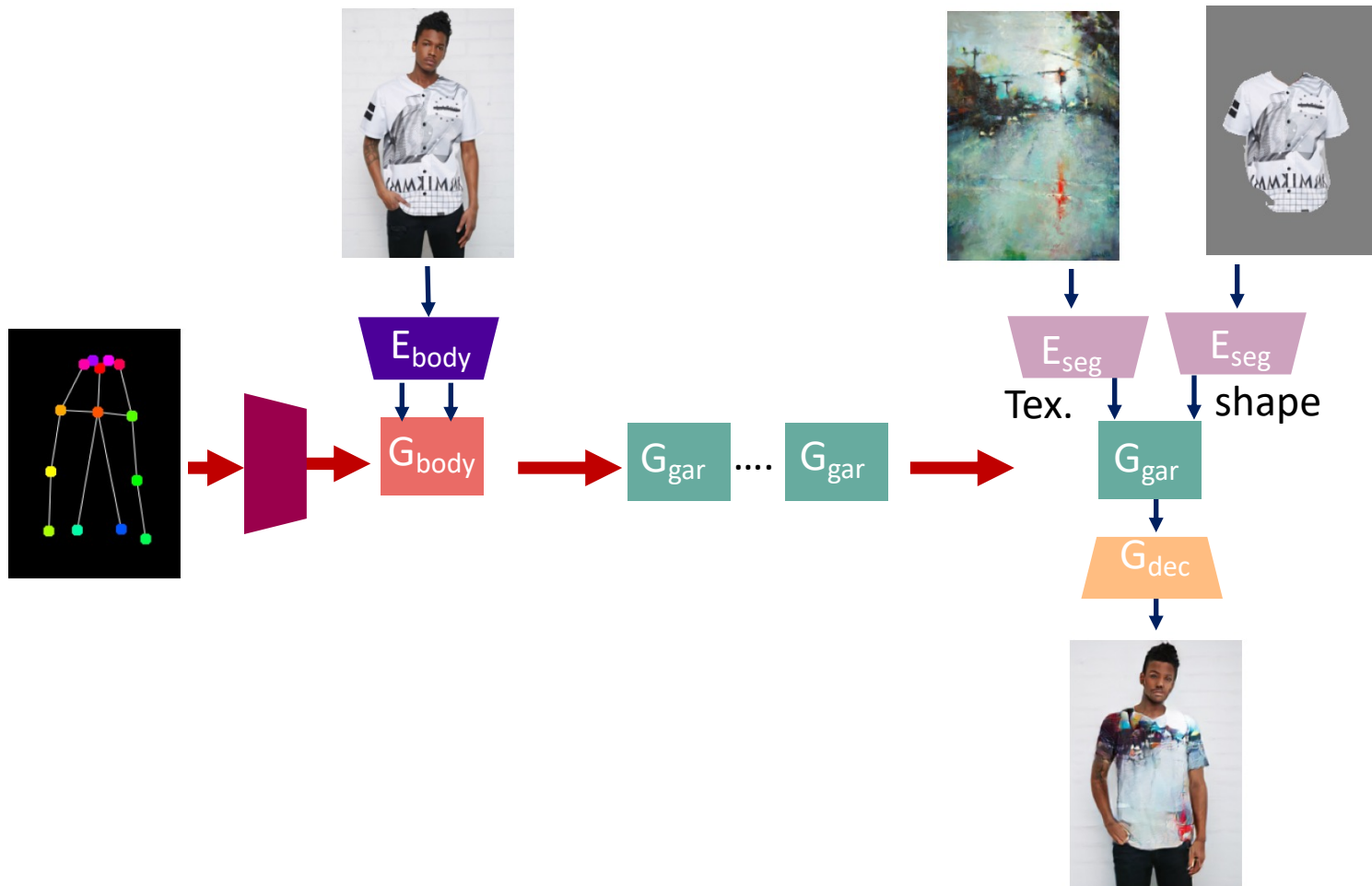
# *Outfit Editing: Reshaping*

- Play with the separated shape/texture encodings



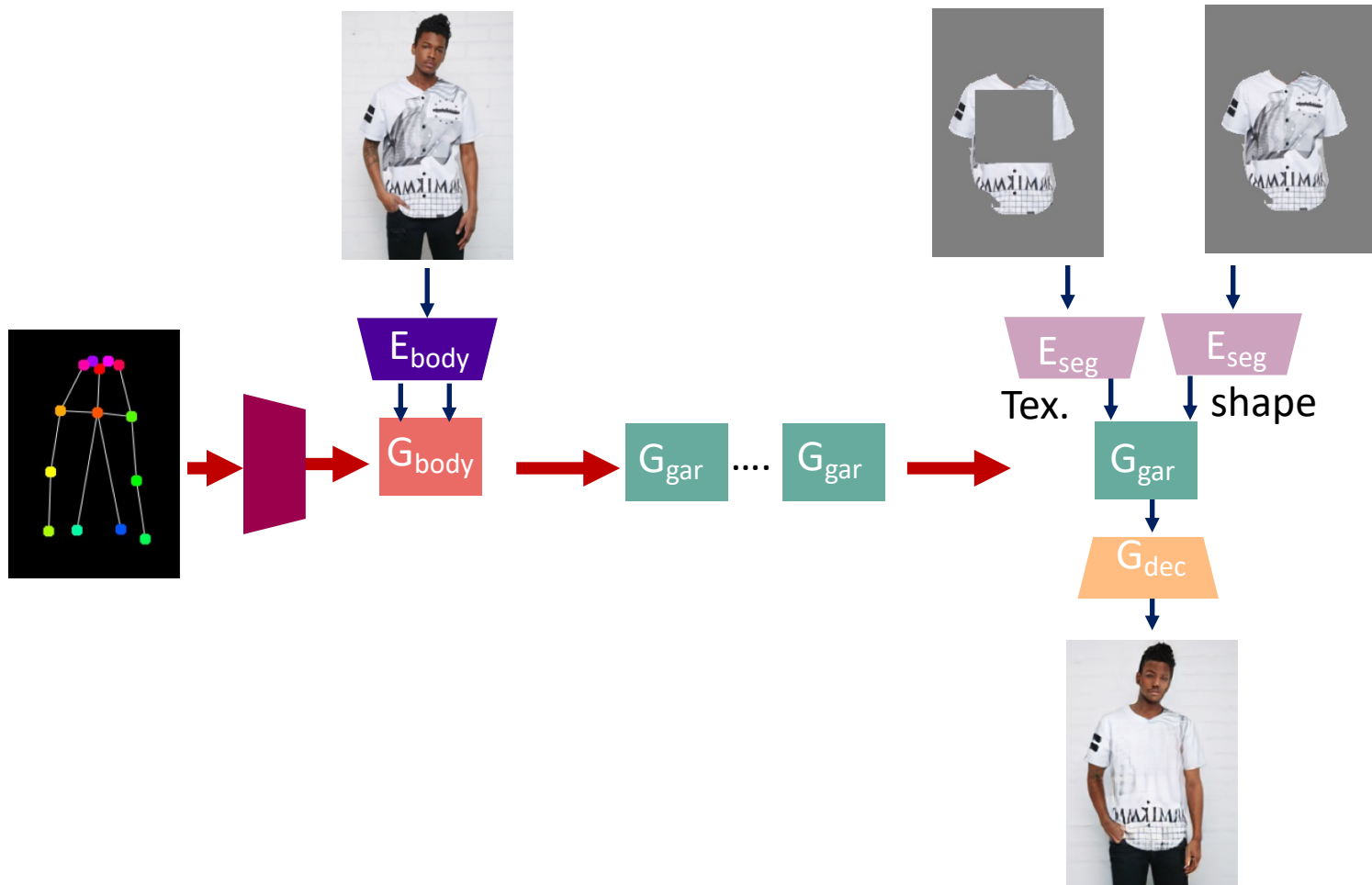
# *Outfit Editing: Texture Transfer*

- Play with the separated shape/texture encodings



# *Outfit Editing: Content Removal*

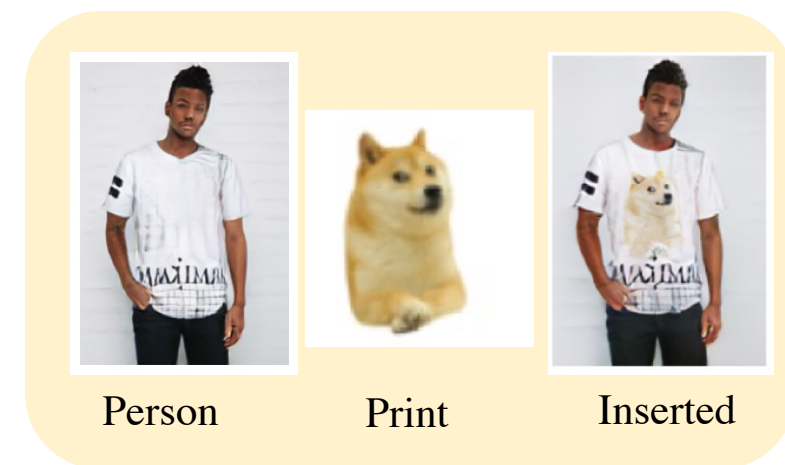
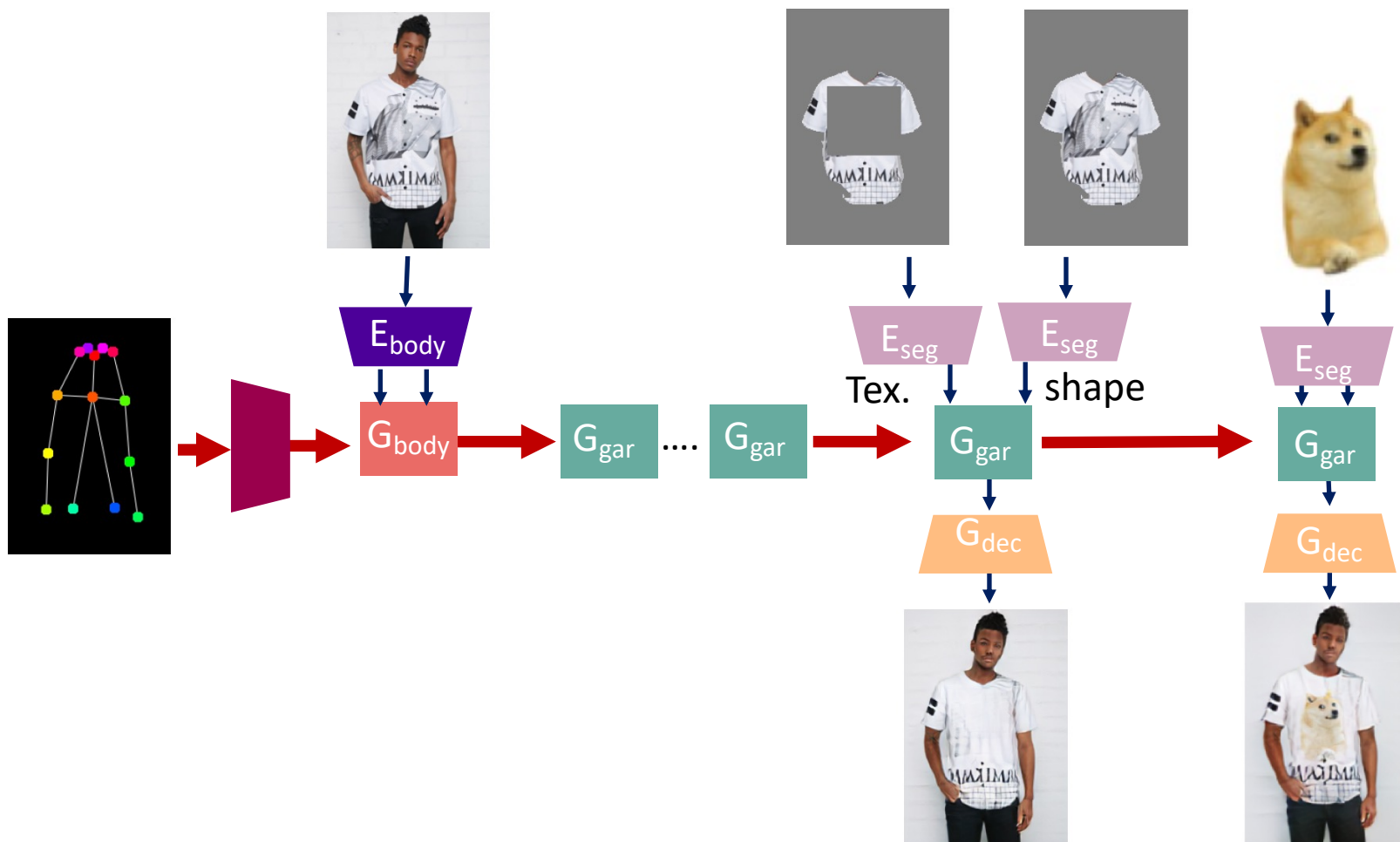
- Play with the separated shape/texture encodings





# *Outfit Editing: Print Insertion*

- Insert a print as an additional “garment”





# Pose Transfer Performance

## User Study

Compared Methods	Preferred others vs. ours
GFLA (CVPR'20)	47.73% vs. <b>52.27%</b>
ADGAN (CVPR'20)	42.52% vs. <b>57.48%</b>



# Virtual Try-On Performance

## User Study

Compared Methods	Preferred others vs. ours
ADGAN (CVPR'20)	19.36% vs. <b>80.64%</b>



# Try-On Applications

## Try-On with different Layouts



## Layer inside vs. outside

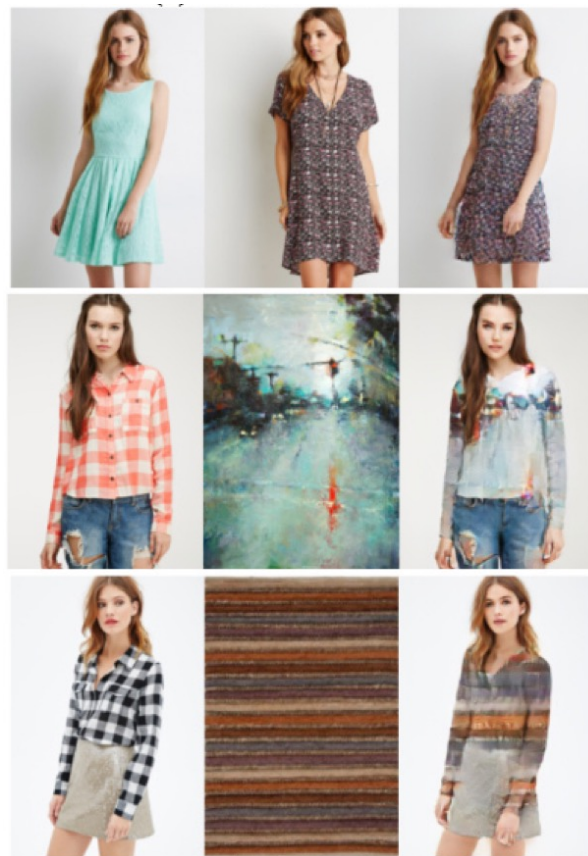


## Keep layering outside



# Editing Applications

**Texture Transfer**



Input

Texture

Transferred

**Reshaping**



Input

Shape

Reshaped



# Editing Applications

## Content Removal

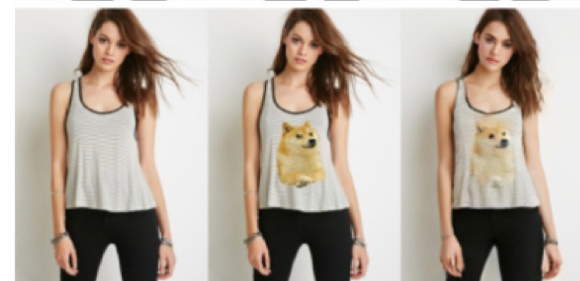


Input

Masked

Removed

## Print Insertion



Input

Copy-and-paste

Inserted

# Summary

- A **recurrent mechanism** to extend virtual try-on to **layering** and **switching dressing order**
- A **flexible framework** to support multiple tasks:
  - Pose transfer
  - Virtual try-on
  - Outfit editing

Project Page: <https://cuiaiyu.github.io/dressing-in-order>  
Code available: <https://github.com/cuiaiyu/dressing-in-order>

