Sukat Online

VIRTUAL TRYING ON OF CLOTHES USING GENERATIVE NEURAL NETWORKS

MADRIGAL | NAVARRO | TUMAMBING | WHITE

“ADD TO CART” HAS BECOME THE NEW MAGIC WORD!

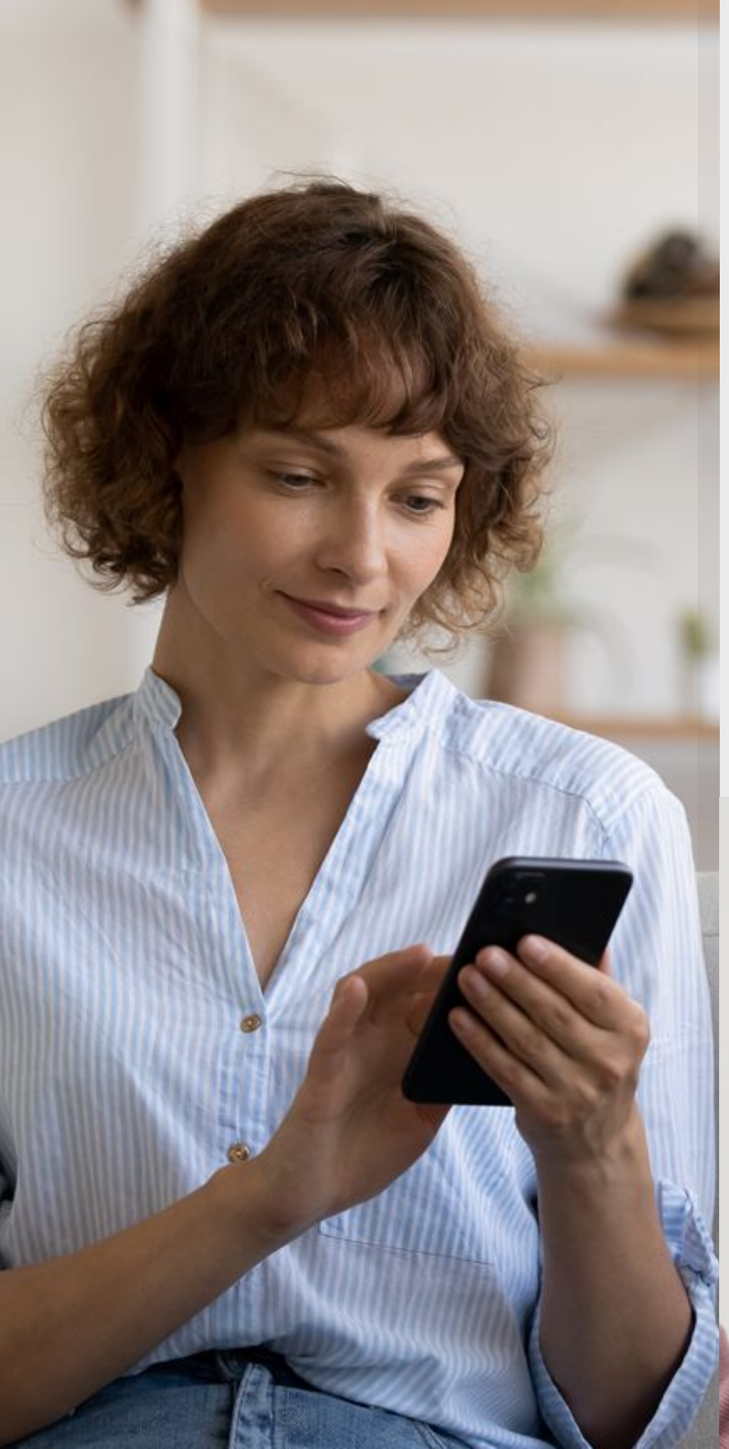
NEW REALITIES

01

e-commerce has grown in 2020

Usage of E-commerce have doubled after the pandemic in the Philippines

Google, Temasek. (2020). *e-Conomy SEA 2020.* Retrieved from https://storage.googleapis.com/gweb-economy-sea.appspot.com/assets/pdf/e-Conomy_SEA_2020_Report.pdf



02 technology enhances experience

Technology empowers brands to make UX more personal

MOBILE FIRST

More users are browsing and making purchase decisions on their phones than laptops

VOICE AND CAMERA SEARCH

Increase in use of Voice and Image searches in e-commerce sites

AUGMENTED REALITY INTEGRATION

Personalized shopping experience through AR

shoppers cannot ***try on clothes,*** feel the fabric, or instantly know if something fits or looks good on them. The ***physical disconnection*** causes them to ***hesitate*** on the purchase

PROBLEM STATEMENT

can we create a Neural Network that allows us to

virtually try on clothes?

REFERENCE PAPER: CP-VTON+

CP-VTON+: Clothing Shape and Texture Preserving Image-Based Virtual Try-On

Matiur Rahman Minar[1], Thai Thanh Tuan[1], Heejune Ahn[1], Paul L. Rosin[2], and Yu-Kun Lai[2]

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METHODOLOGY

01

Image Masking

Generates masks containing key features of target image

02

Clothing Warping

Warps clothing image to body pose

03

Virtual Try-On

Fit warped clothes to the target image using a NN

METHODOLOGY

01

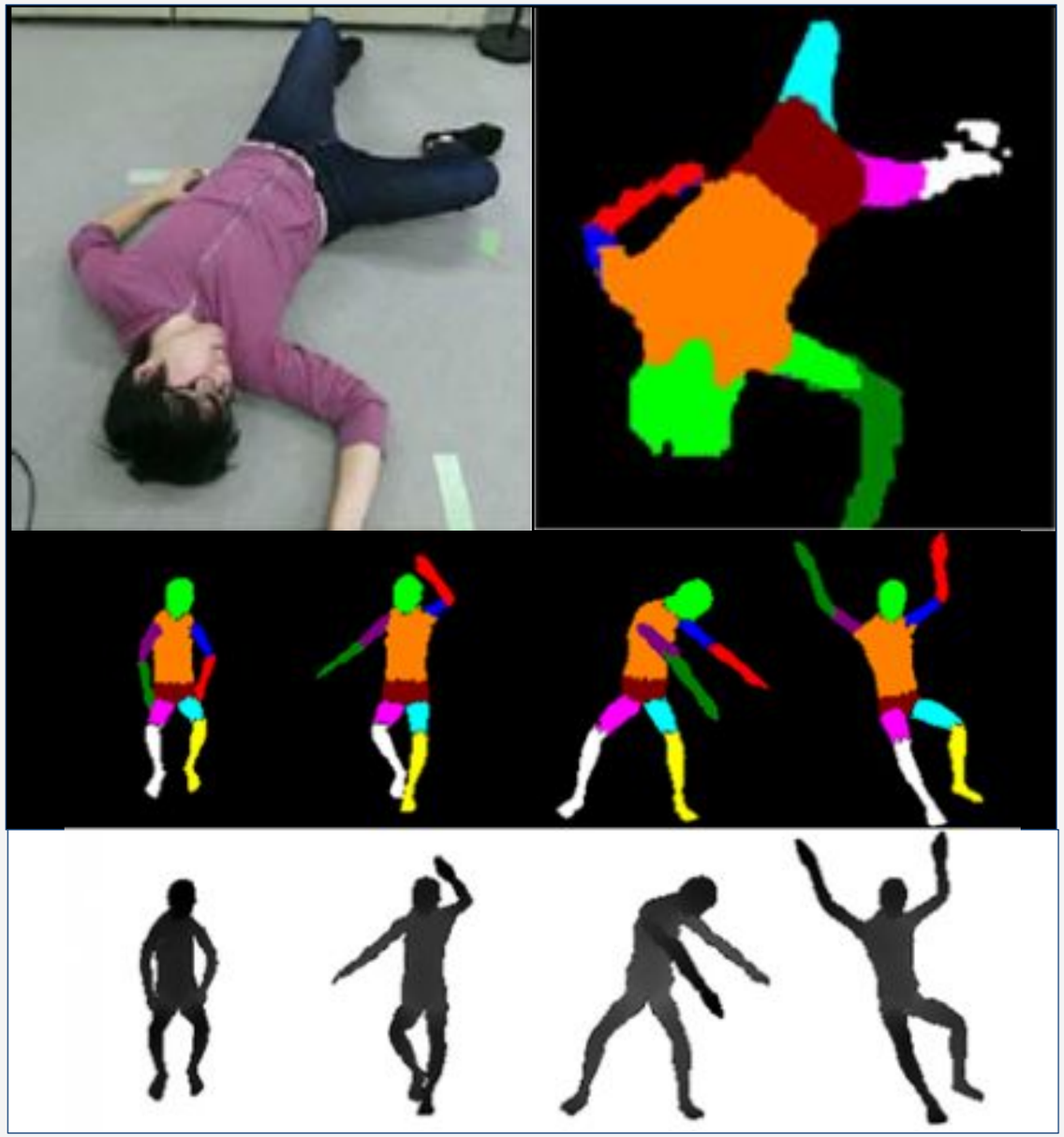
Image Masking

14,500 clothes-person image pairs

Pretrained Networks

“Part Grouping Network (PGN)” generated Body Part Masks

“OpenPose COCO” generated postures

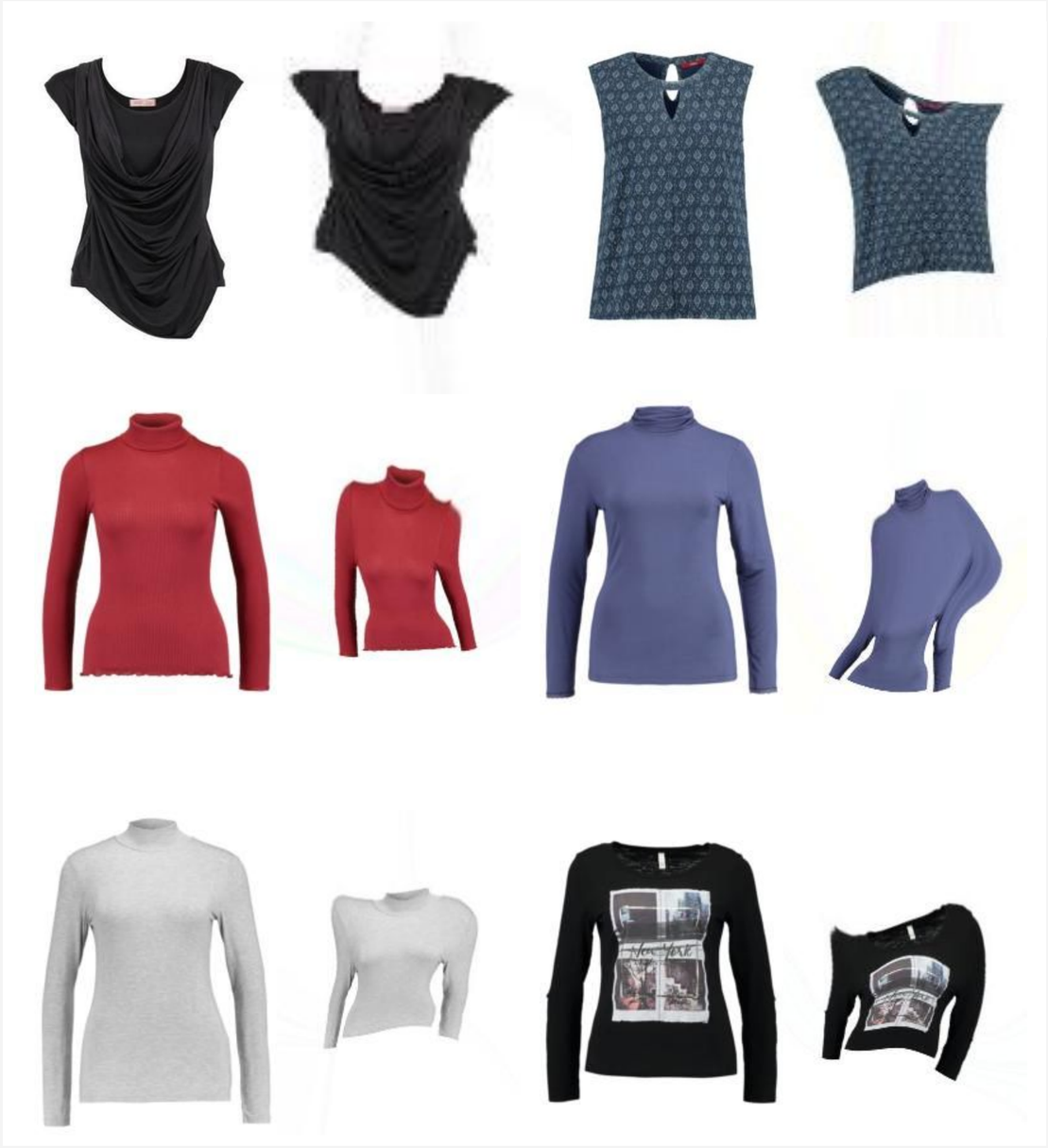


METHODOLOGY

02

Clothing Warping

Pretrained “Geometric Matching Model” generated warped clothes

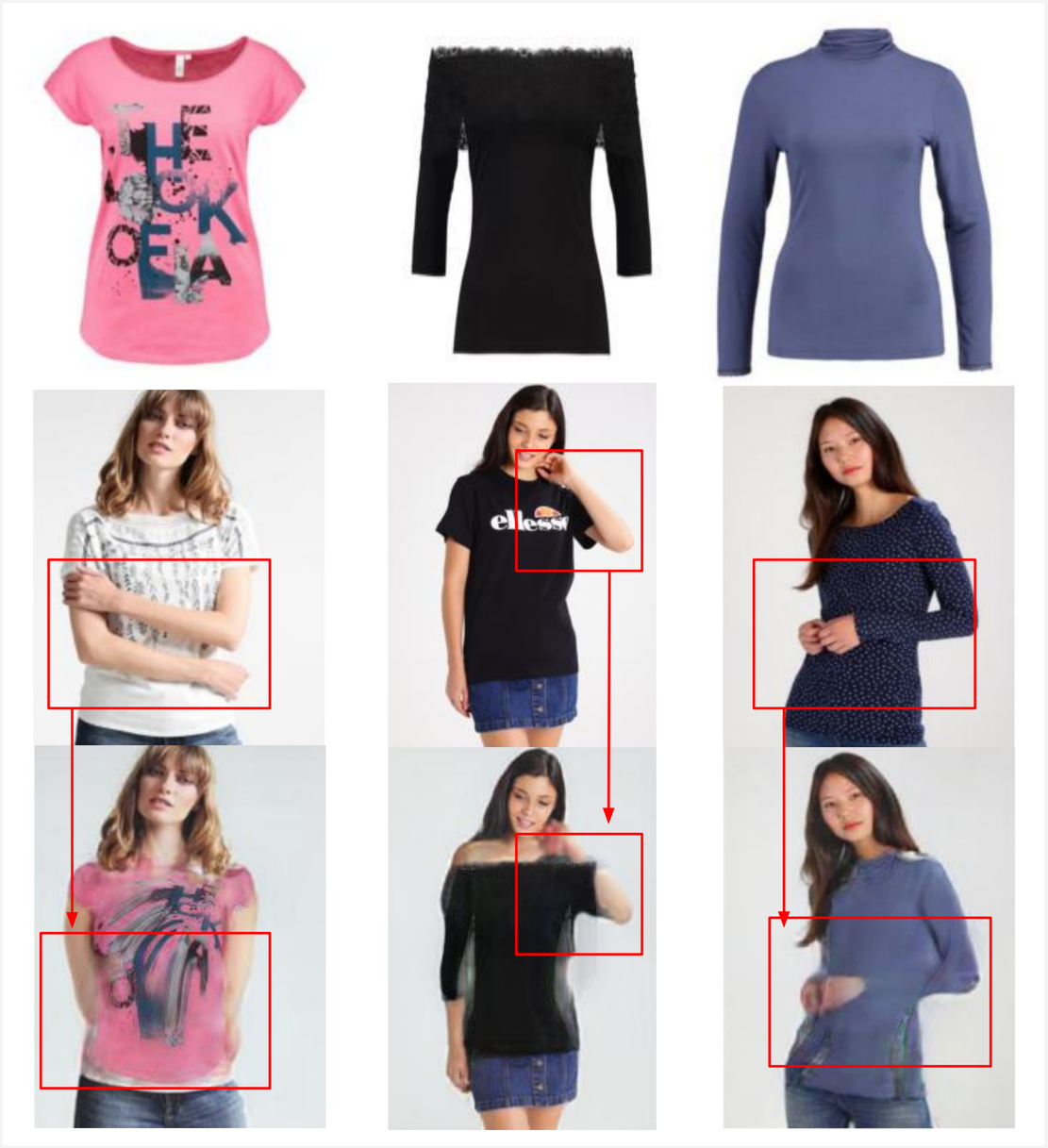


METHODOLOGY

03

Virtual Try-on

UNet Generative Model + VGG-19
Discriminator Model



NETWORK ARCHITECTURE

Perceptual Loss

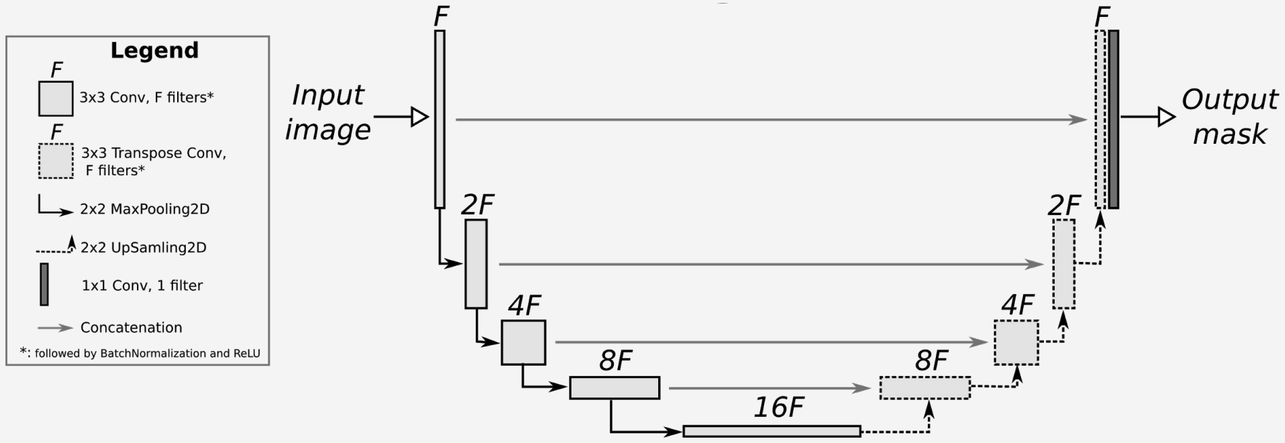
Computes the difference of the two images

$$L1LossFunction = \sum_{i=1}^{n} |y_{true} - y_{predicted}|$$

$$L_{total} = Ll_{image} + Ll_{mask} + Ll_{VGG}$$

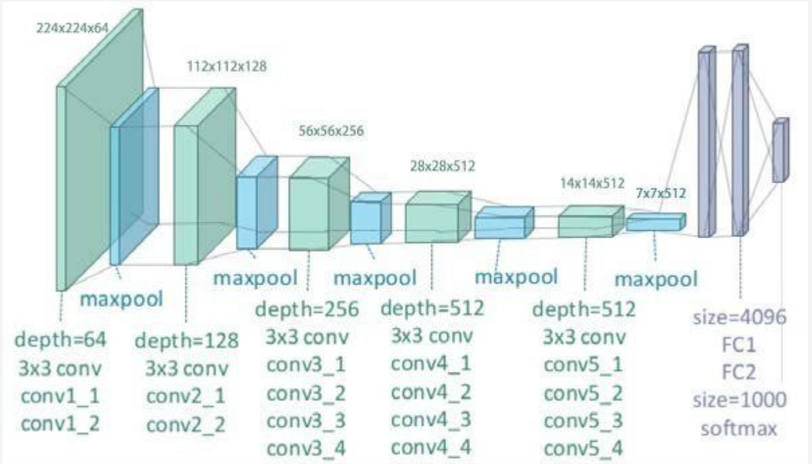
Generator

U-Net Encoder-Decoder Structure -- 21, 350, 276 Parameters | 280 MB



Discriminator

VGG-19 Classifier -- 22, 384, 192 Parameters | 320MB



RESULTS: QUANTITATIVE PERFORMANCE v/s BENCHMARKS

	Our Work	CPVTON+	
Structure Similarity Index Measure (SSIM)	75.3%	74.3%	similarity between two images taking into account textural differences. **Higher similarity, the better!**
Learned Perceptual Image Patch Similarity (LPIPS)	25.4%	26.3%	measures the distance between image patches. **Lower means more similar!**
Total Training Time	12 hours		Using GPU and PyTorch. **370, 000 iterations**
Execution Time After training	2 seconds		

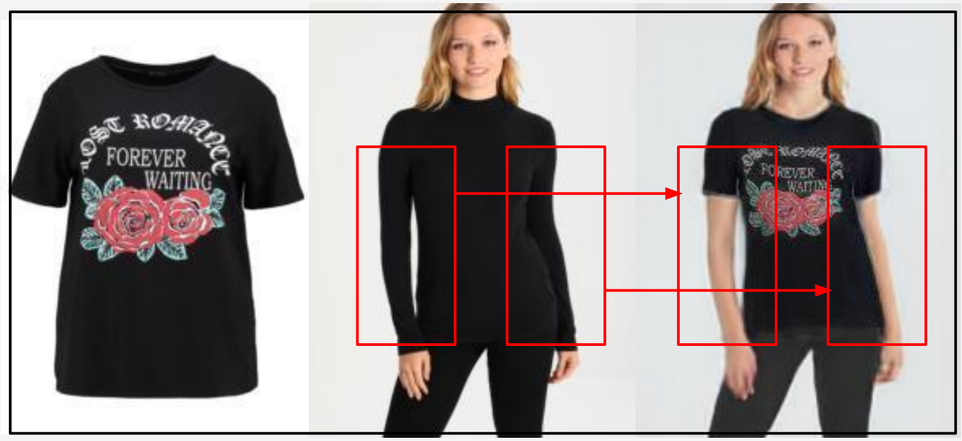
RESULTS: QUALITATIVE PERFORMANCE

arms and neck were reconstructed

hair was left as is

left arm was left uncovered

arms and neck were reconstructed



RESULTS: CURRENT LIMITATIONS

double shirt tried to be fitted as a one

shoulder was interpreted as part of clothes

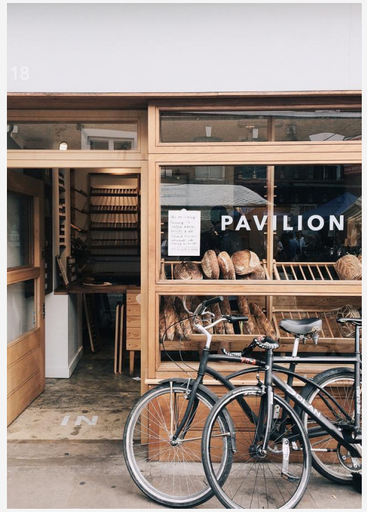
front view is tried to be fitted to back view

neck was interpreted as part of the clothes

CONCLUSIONS AND RECOMMENDATIONS

enhance UX in online shopping

Sukat Online can help fashion brands create a **strong virtual connection** between the shopper and the item



AR-powered shopping in the horizon

Sukat Online can serve as a start point for incorporating Augmented Reality in the Online Shopping experience

utilize GANs for more realistic renders

altering both generator and discriminator architecture might give better results.

GET TO KNOW MORE ABOUT US BY CONNECTION ON LINKEDIN!

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Thank you!

http://bit.ly/sukatonline

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