GRINN - Garment Recognition in Neural Networks

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Abstract

2ULaundry, a company that takes care of your laundry for you, faces a serious problem of customer complaints about "**missing**" clothes due to lack of proper cataloging. This issue leads to customer's loss of trust, which can potentially result in losing customers. Hence, we have come up with a solution to efficiently track the category and number of garments for every customer. This computer vision solution will help solve logistics and routing for 2ULaundry.

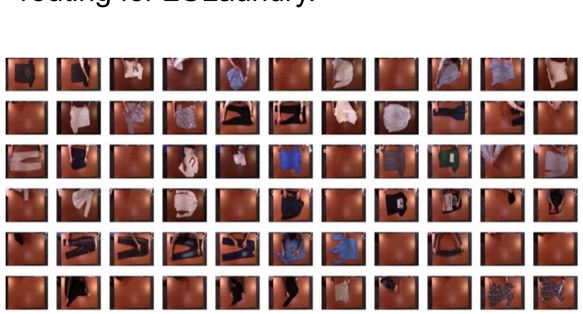
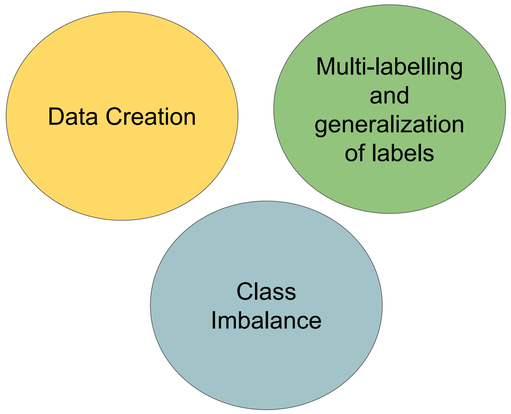


Fig 1. Example images from our dataset.

Challenges



Dataset

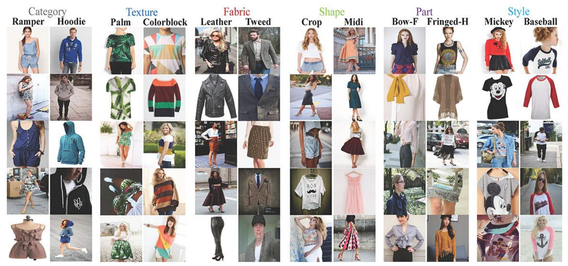


Fig 2. Example images of different categories and attributes in DeepFashion dataset that is used for training.

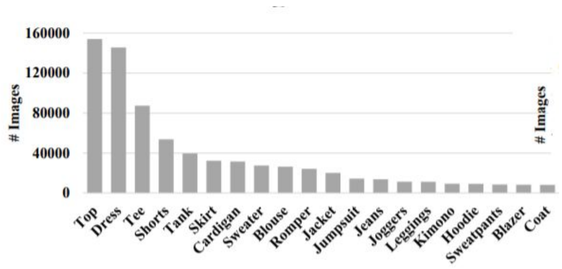


Fig 3. Number of images for top 20 categories in DeepFashion dataset.

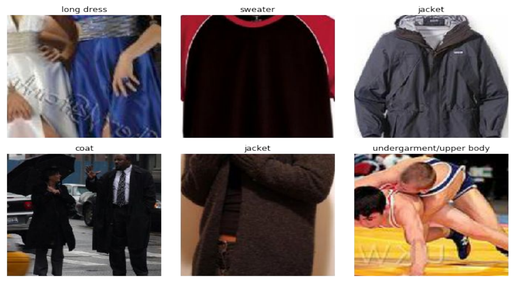
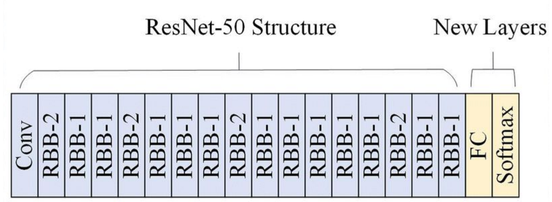


Fig 4. Example images of different categories in ETH80k Fashion dataset that is used for training.

Model



Pre-trained ResNet-50 on ImageNet Datasets

Custom Head

Input video

Model weights

Images from video

Voting

- Proposed model and algorithm can work with video directly without having a person pick the best frames to make predictions on.
- With the overhead camera, we can capture, detect, and store the garments for every customer.

Results

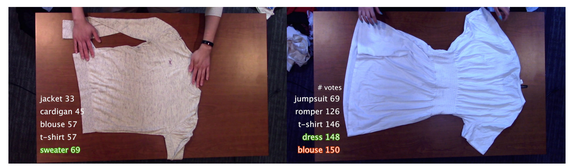


Fig 5. Some example outputs from our pipeline. On the left hand side of each example, top 5 predicted labels are shown along with their votes. Ground truth is displayed with green color. In case the ground truth and top-most predicted label differ, red represents the top predicted label.

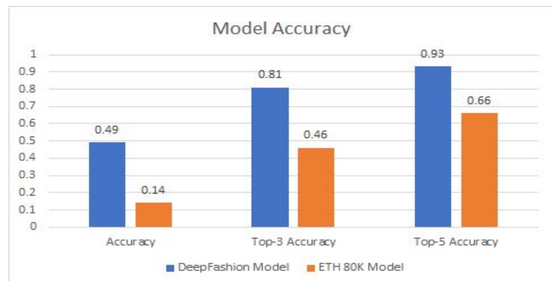


Fig 6. Performance of our model on the test video using different training datasets.

Methods	Category	
	top-3	top-5
WTBI	43.73	66.26
DARN	59.48	79.58
FashionNet	82.58	90.17
LU *et al.*	86.72	92.51
Corbiere *et al.*	86.30	92.8
Wang *et al.*	90.99	95.78
Liu *et al.* ***(State-of-the-Art)***	91.16	96.12
OURS	**81.40**	**93.02**

Table 1. Comparative analysis of experimental results on the DeepFashion dataset. Results from our model are marked in **bold**.

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