

GRINN - GARMENT RECOGNITION IN NEURAL NETWORKS

NEHA PATIL, AKANKSHA BHALLA, PRASHANT MADAAN,
THAO TRAN, ANTONIO ORR

UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE

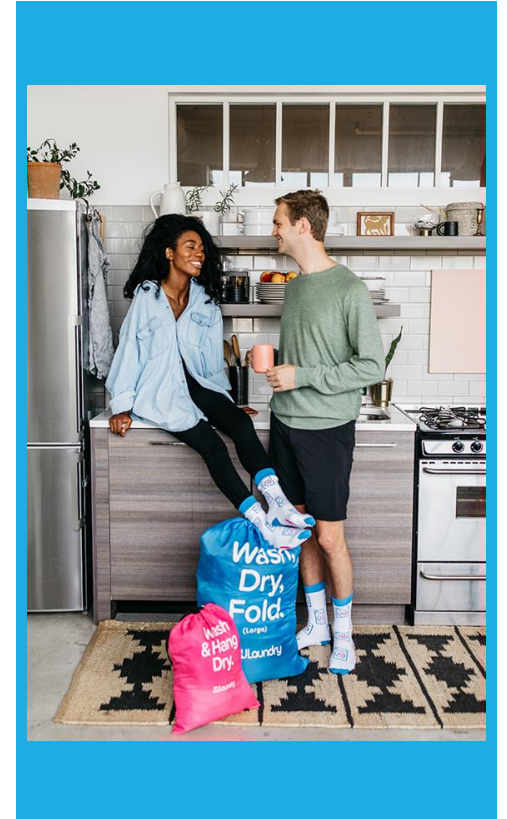
IN ASSOCIATION WITH: 2ULAUNDRY

*Computer Vision's state-of-the-art
solution to cataloging clothes*

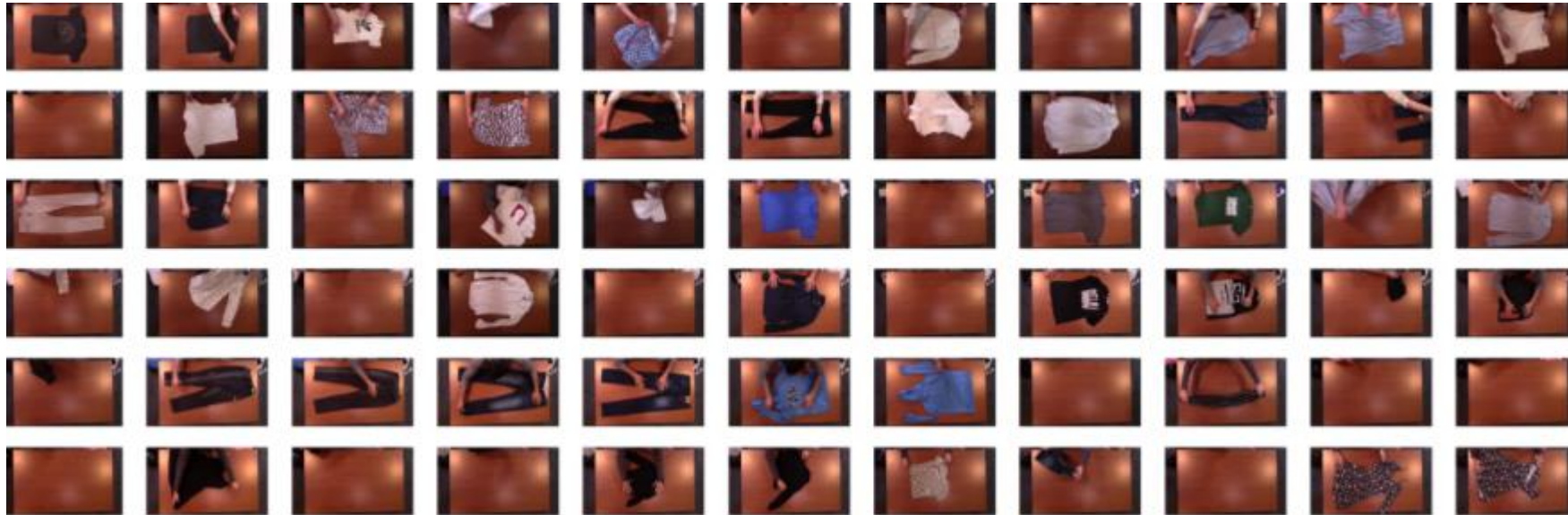


ABSTRACT

- 2ULaundry, a company that handles your laundry for you, has received customer complaints about “**missing**” clothes due to lack of proper cataloging.
- We have devised a model that efficiently tracks the category and number of garments for every customer.
- This computer vision solution will help solve logistics and routing for 2ULaundry.



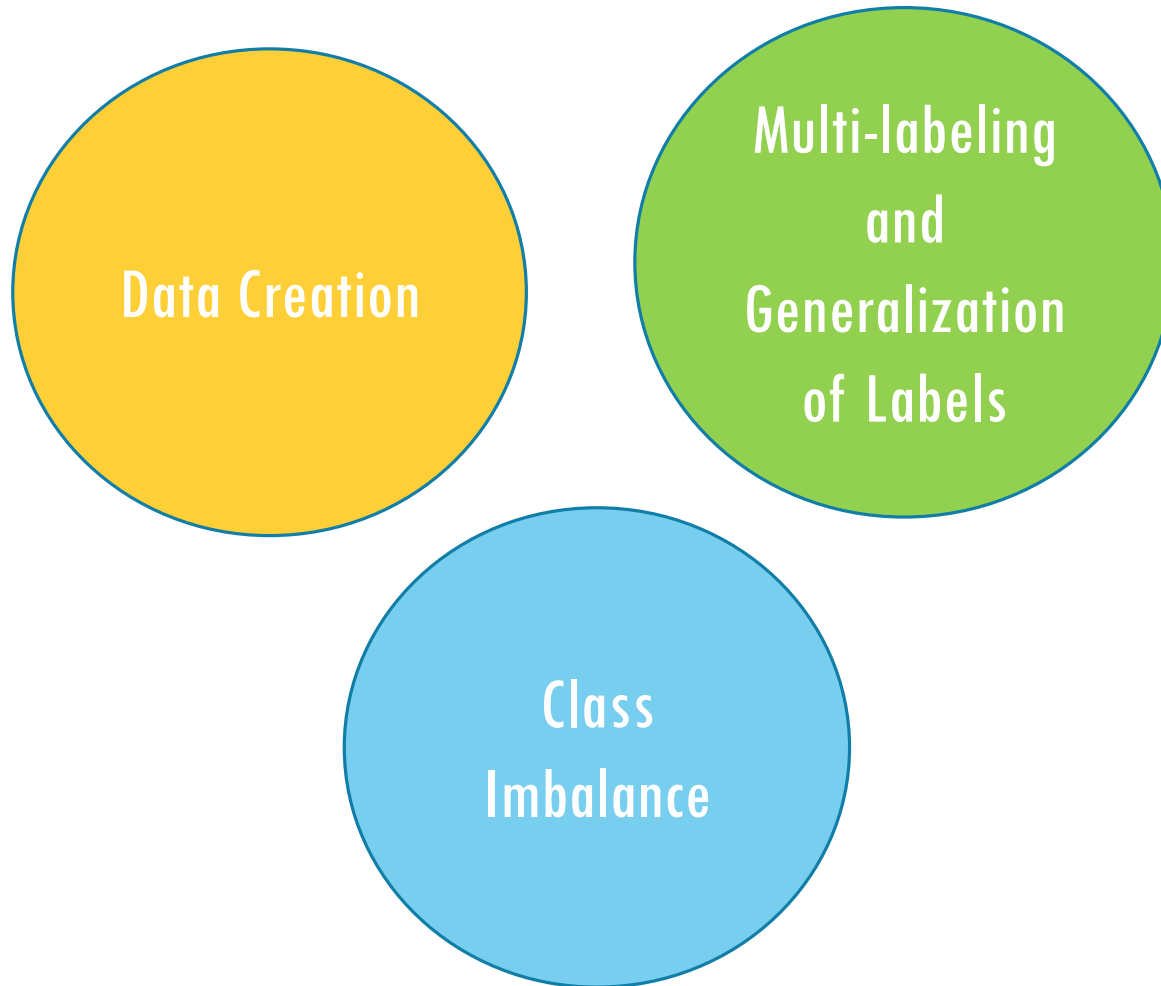
OUR OWN DATASET



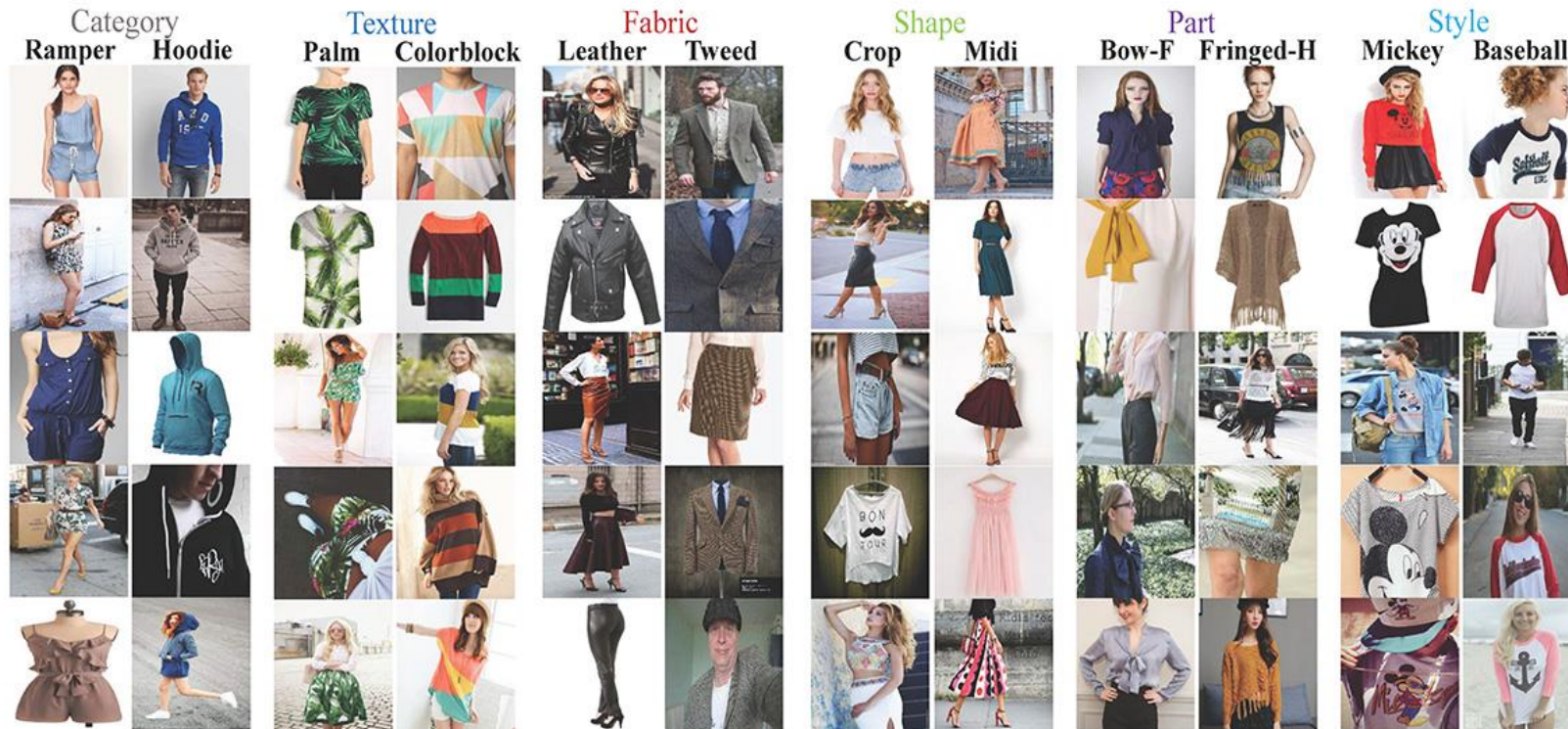
Example images from our dataset.



CHALLENGES



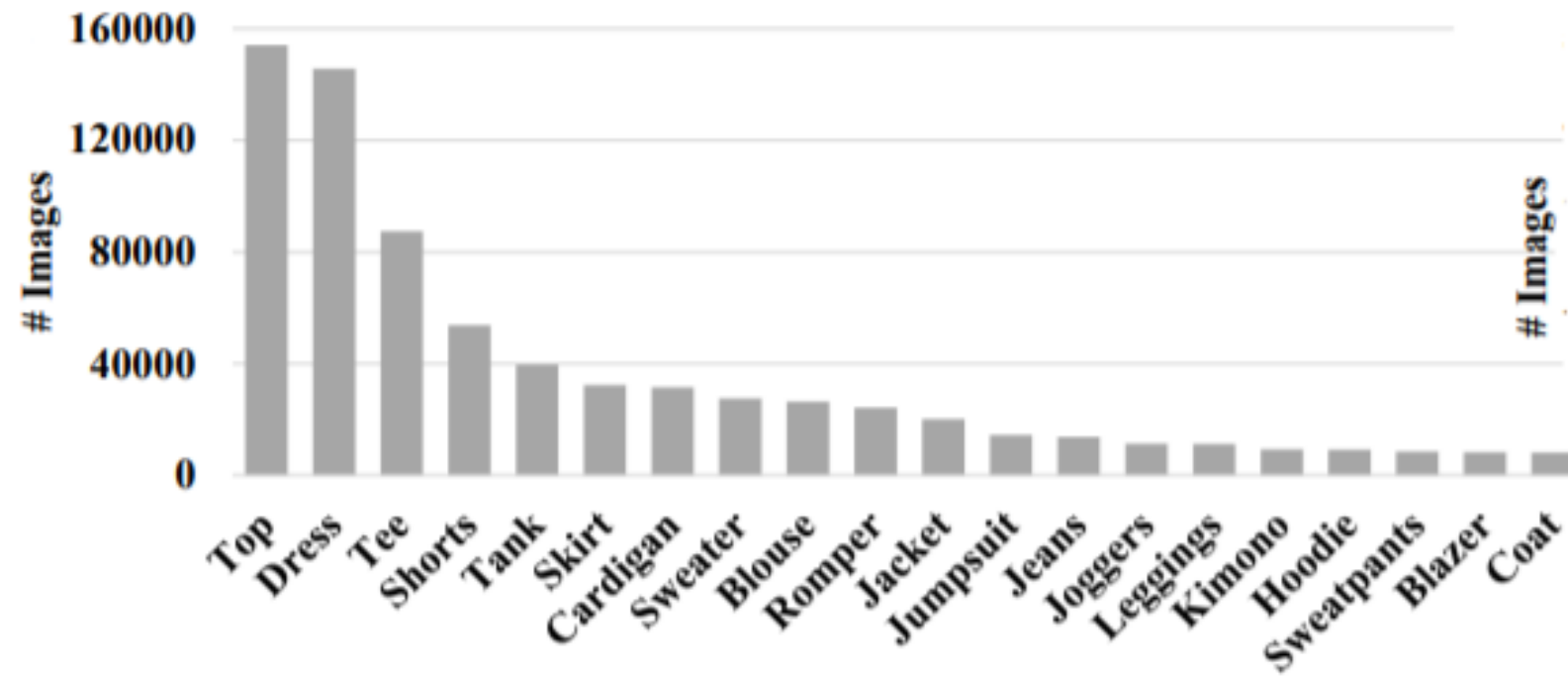
TRAINING DATASET



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



TRAINING DATASET



Number of images for top 20 categories in DeepFashion dataset.

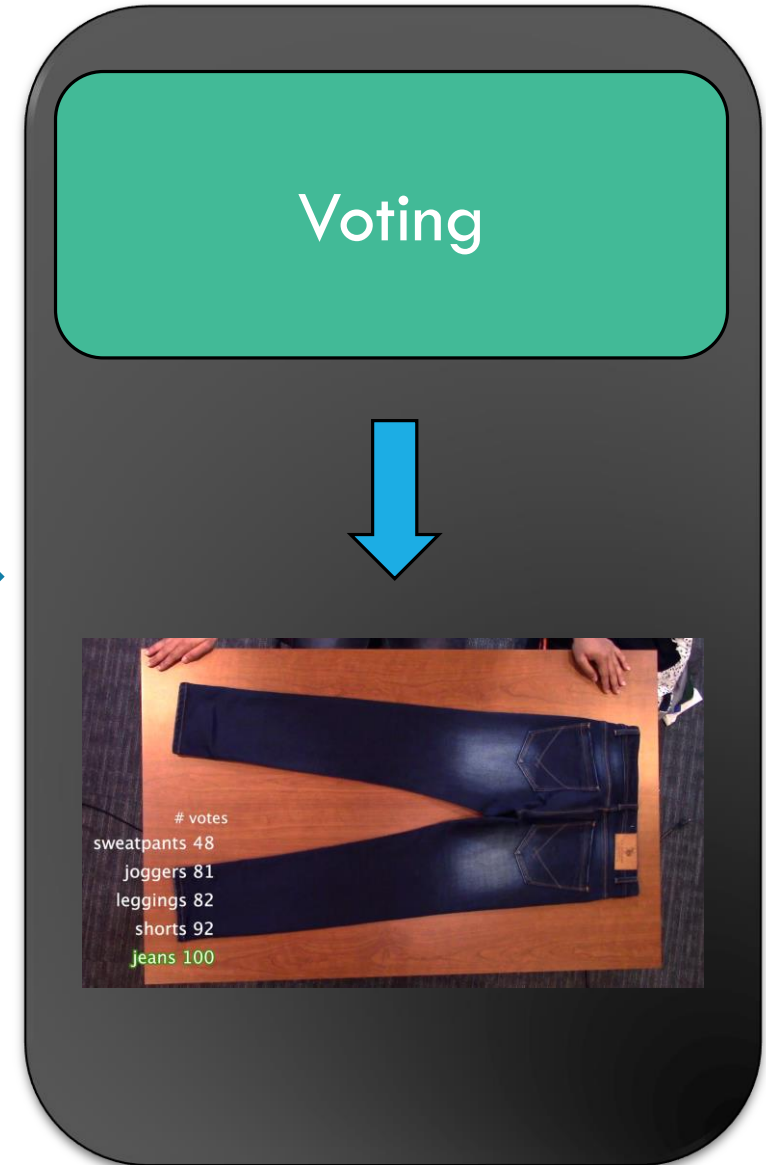
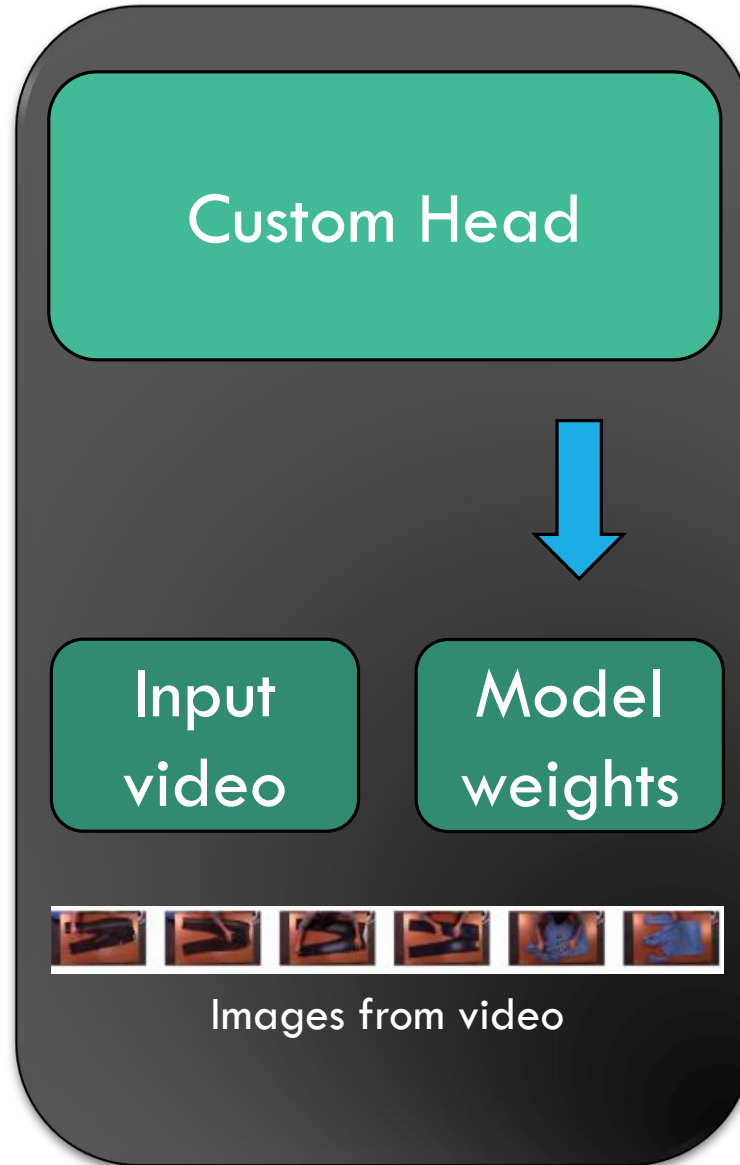
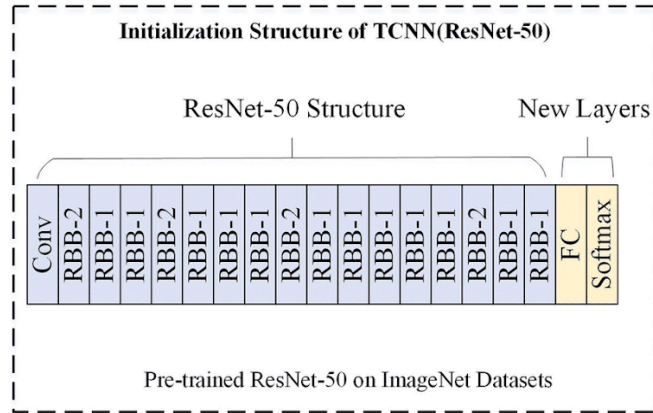


TRAINING DATASET



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

MODEL



NOTES ABOUT MODEL

- 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.



DEMO VIDEO



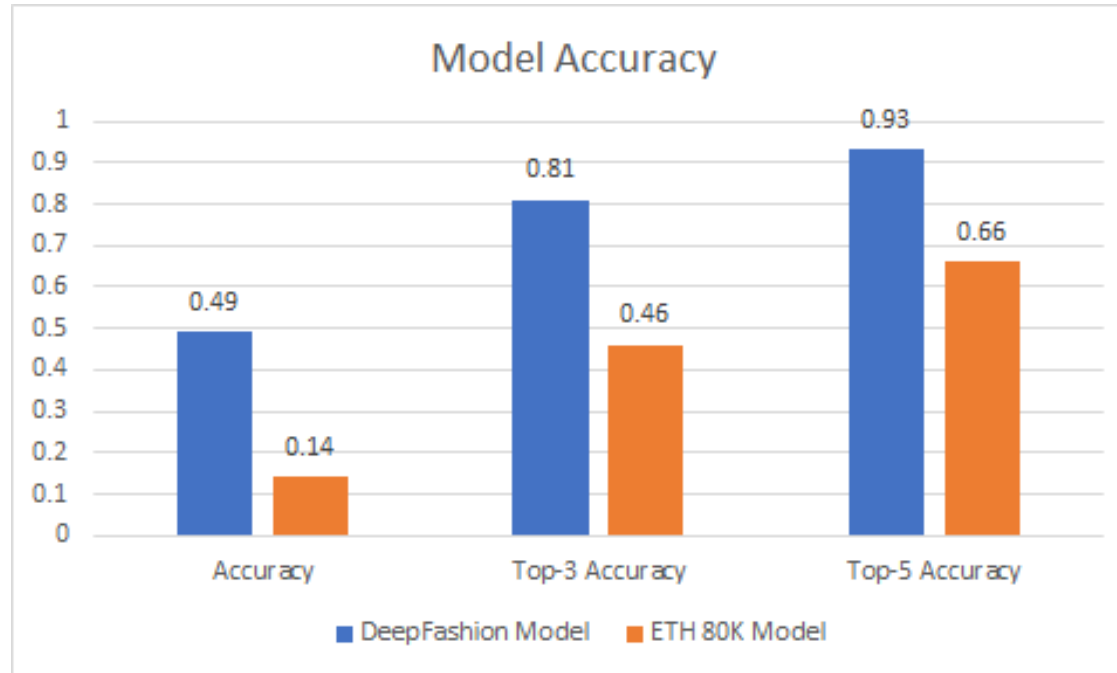
RESULTS



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.



ACCURACY



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



COMPARISONS

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

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



ACKNOWLEDGEMENTS

Adjunct professor, CCI:

Stephen Welch

Head of R&D, 2ULaundry:

Gregory Baker



GITHUB

<https://github.com/thaotrongtran/GRINN>



OTHER LINKS

- 2ULaundry: <https://www.2ulaundry.com/>
- [DeepFashion Dataset & Paper](#)
- [ETH 80K Dataset & Paper](#)
- [State-of-the-art comparisons on DeepFashion](#)

