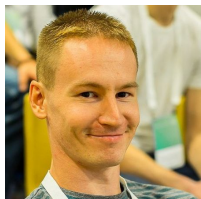
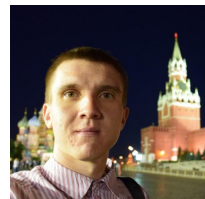




Fine-Grained Visual Categorization (Kaggle iMaterialist Contest, 6th place)

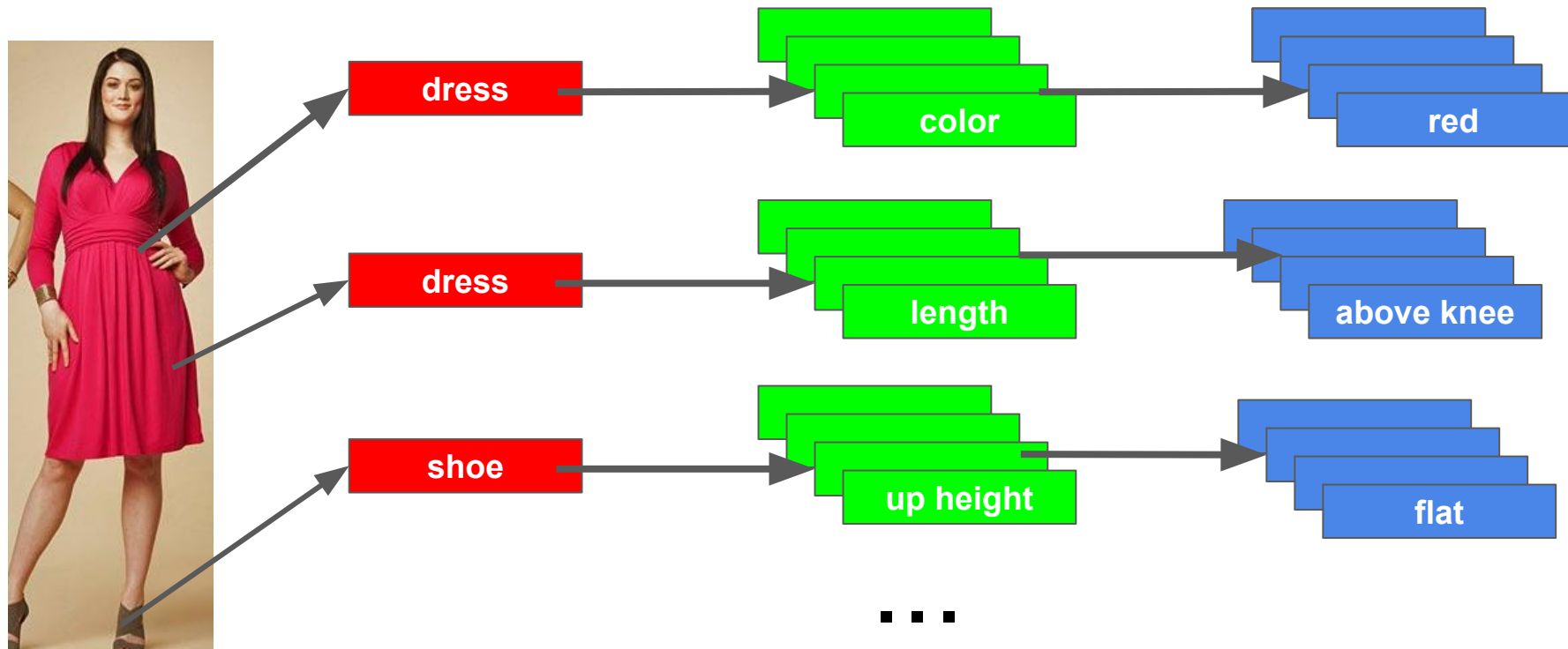


Arthur Kuzin
kaggle.com/drn01z3
ODS: @n01z3



Dmitry Kozlov
kaggle.com/dkozlov
ODS: @dkozlov

Problem statement



Evaluation: Top 1 error rate of the predictions

For each image i and task t ,
there might be multiple labels $g_{it,k}$
and the algorithm will produce a **most
confident label** l_{it} .

$$e_{it} = \min_k d(l_{it}, g_{it,k})$$

$$d(x, y) = \begin{cases} 0, & \text{if } x = y \\ 1, & \text{otherwise} \end{cases}$$

If **produced label is the same as one of the
ground truth labels**,
then the prediction is considered to be correct

$$score = \frac{1}{N} \sum_{i,t} (e_{it})$$

Hierarchy of labels, 1st level

Shoe

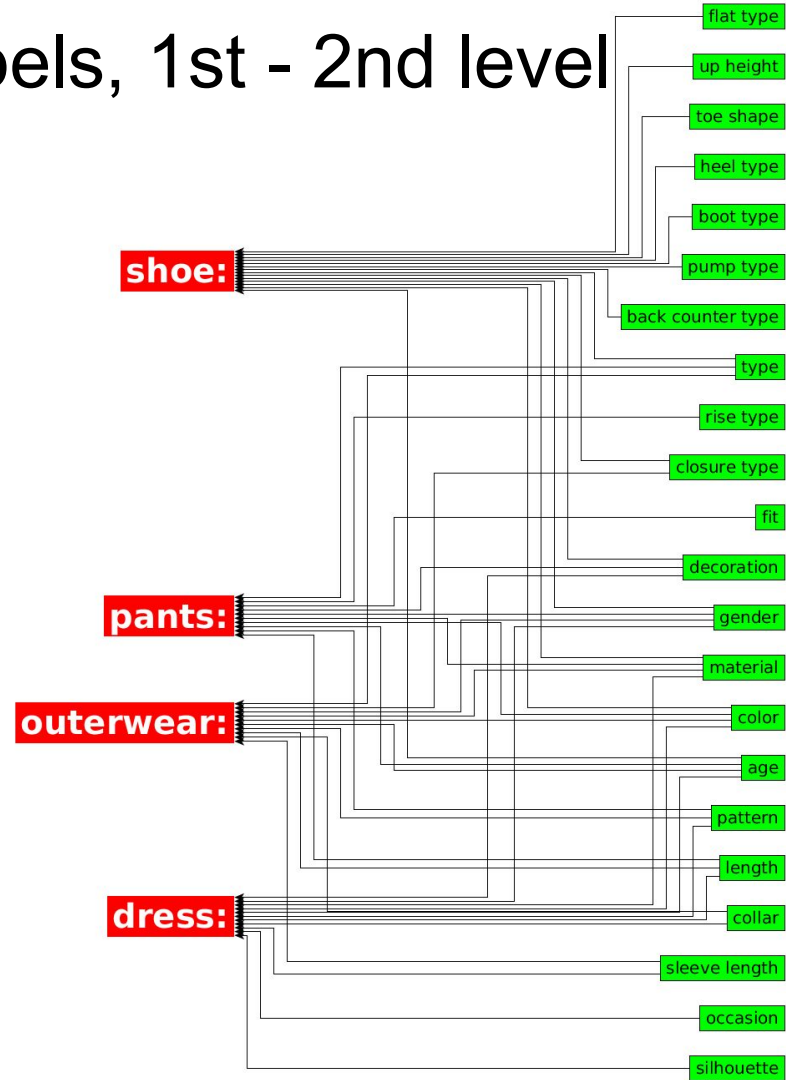
Pants

Outerwear

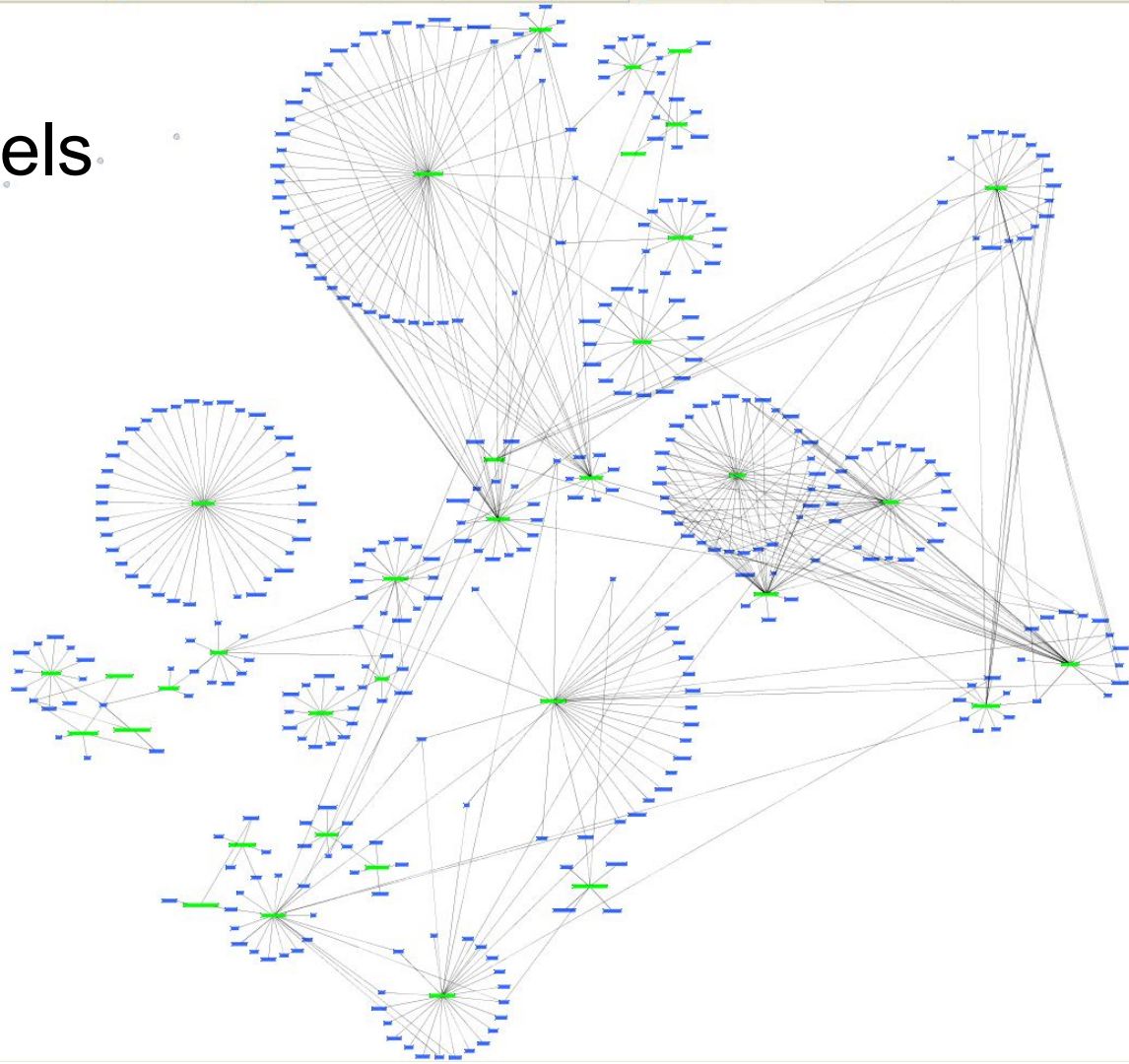
Dress

Hierarchy of labels, 1st - 2nd level

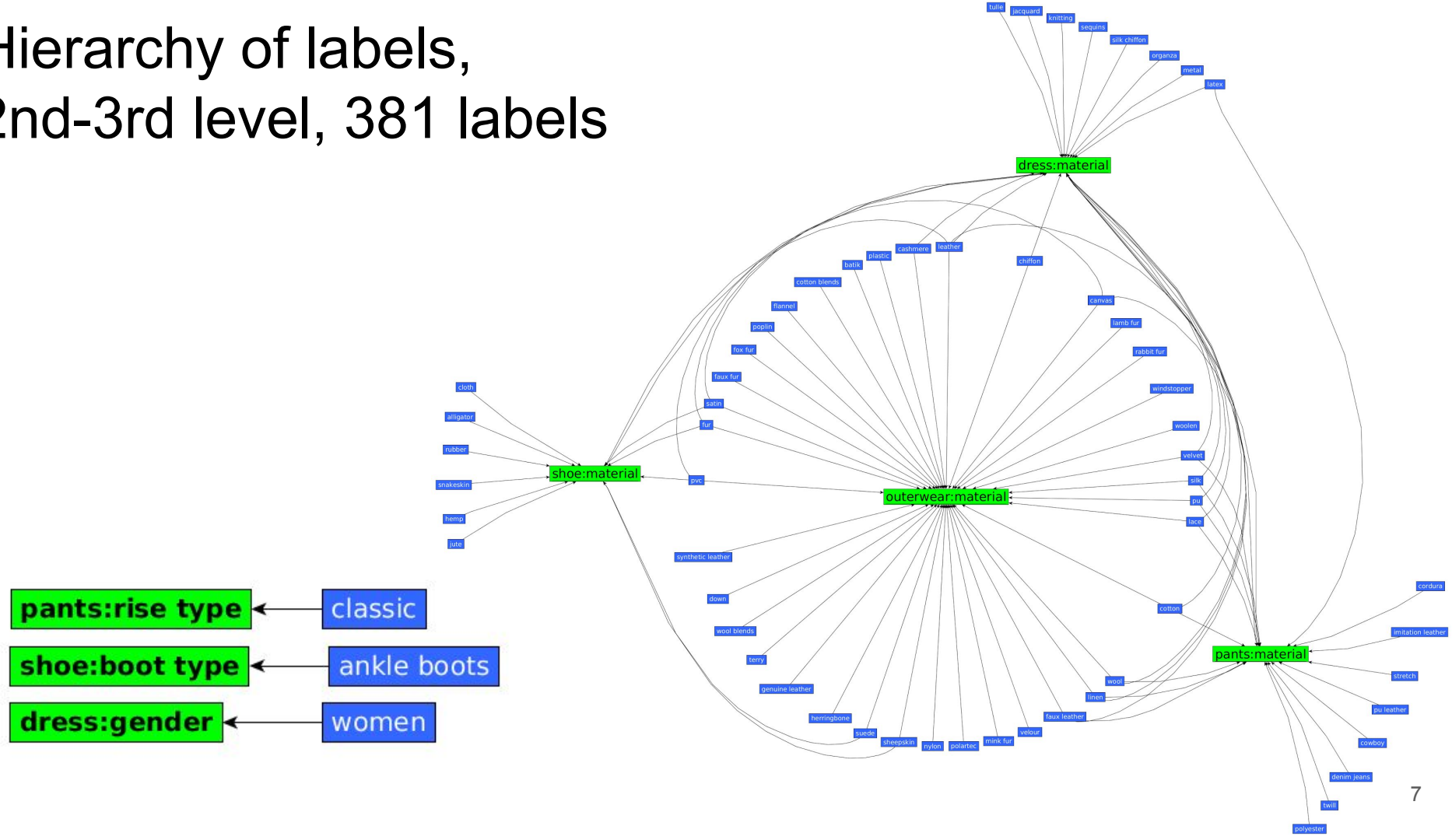
45 tasks



Hierarchy of labels,
2nd-3rd level, 381 labels



Hierarchy of labels, 2nd-3rd level, 381 labels

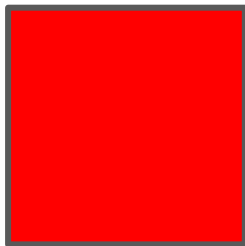


Data

Train

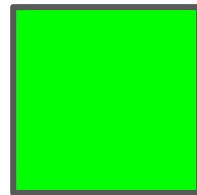
50 461 images ~ 5 GB

381 attribute labels



Test

33 726 images ~ 3.3 GB



50% public

50% private

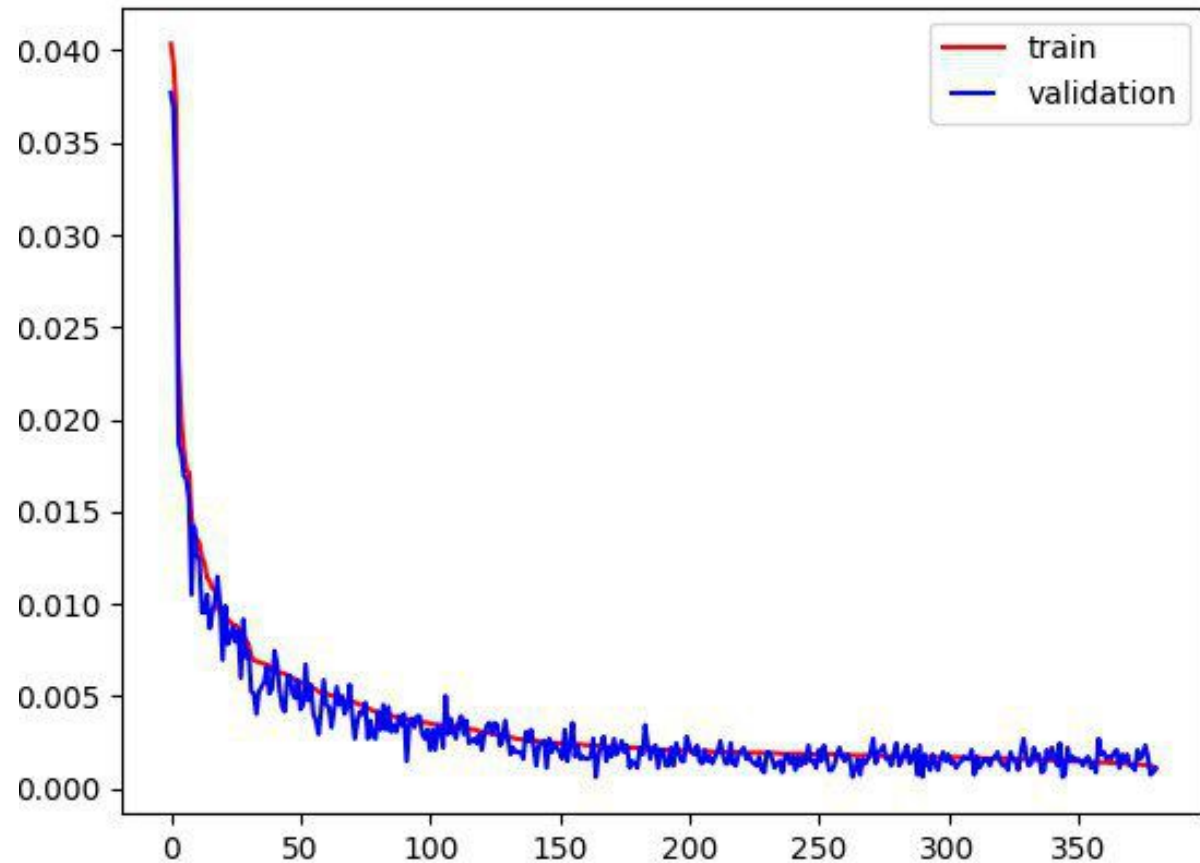
Dataset difficulties



Dataset difficulties




Attribute labels distribution




Battle for disappearing data

Note that we only provide image urls, which may become unavailable over time. Therefore we suggest that the participants start downloading the images as early as possible.

1







Test data download failed about 2%
posted 2 months ago by [fujisan](#)

last comment by
[Richardaecn](#) a month ago

3

1







Different datasets for everyone
posted a month ago by [medivh.gjw](#)

last comment by
[medivh.gjw](#) a month ago

0

8







Incomplete datasets
posted 2 months ago by [Farbod Faghihi](#)

last comment by
[Krzysztof Dzie...](#) a month ago

3

1







Request for Data/Download Scripts
posted a month ago by [Nirant](#)

last comment by
[Farbod Faghihi](#) a month ago

1

6





If only there were atleast some points....
posted 2 months ago by [Abhishek](#)

last comment by
[Abhishek](#) 2 months ago

0

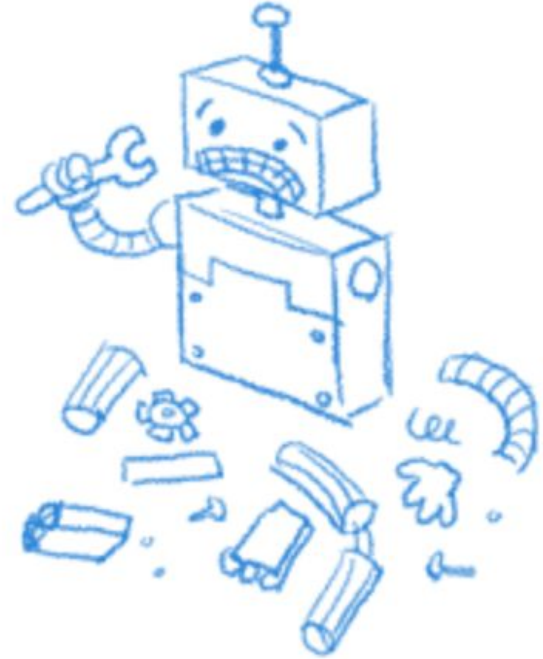
Battle for disappearing data



**Initially 3% of data was missing
Each day we lost ~0.1% of data**

404. That's an error.

The requested URL `/mltrainings_live_imaterialist-challenge-FGVC2017` was not found on this server. That's all we know.



Battle for disappearing data

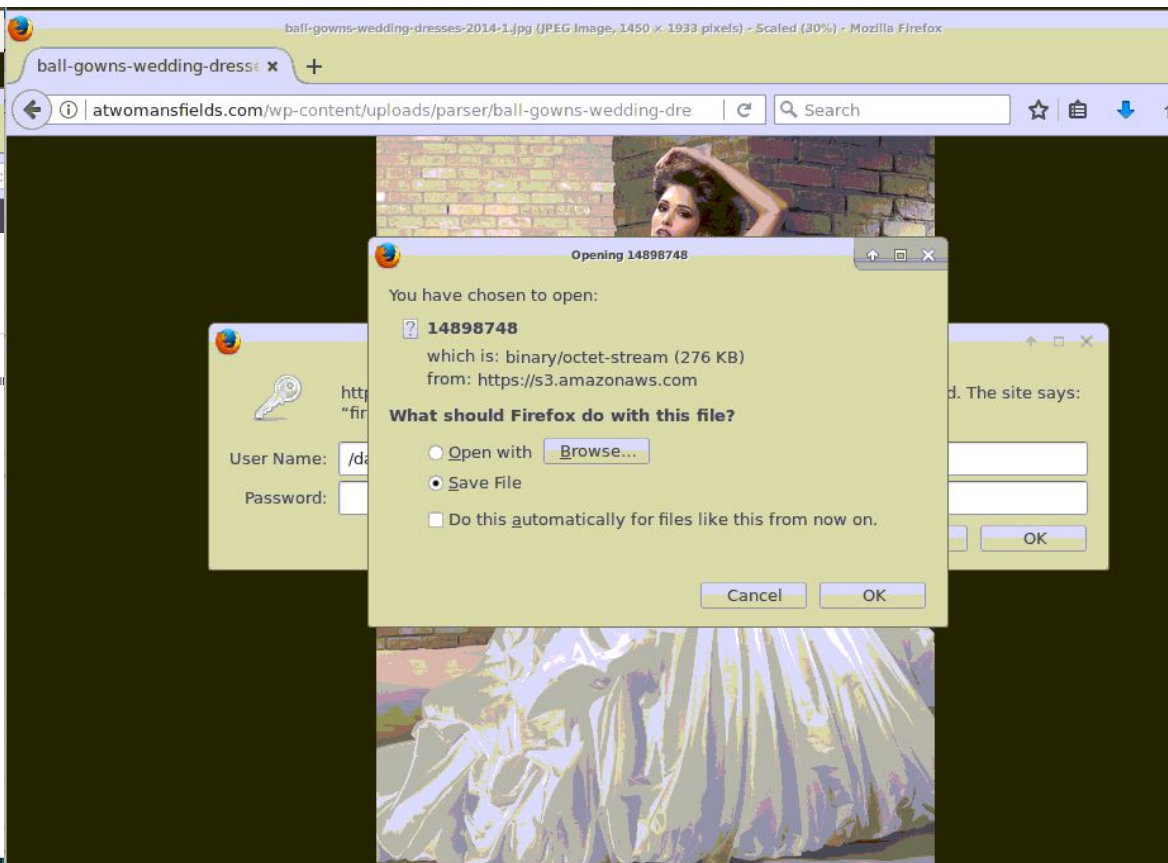
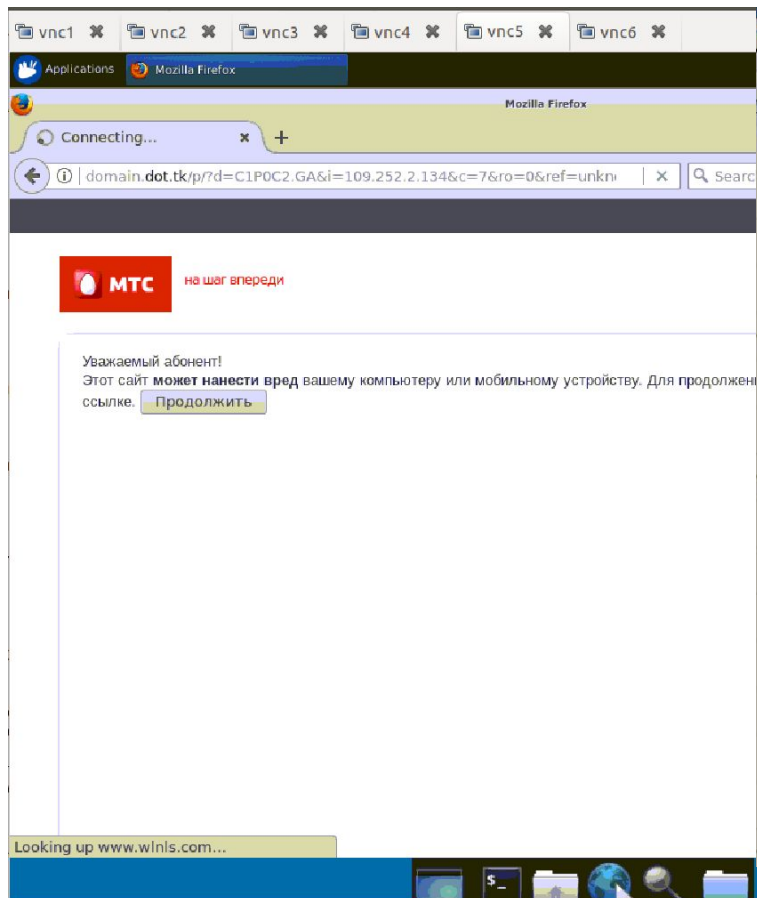
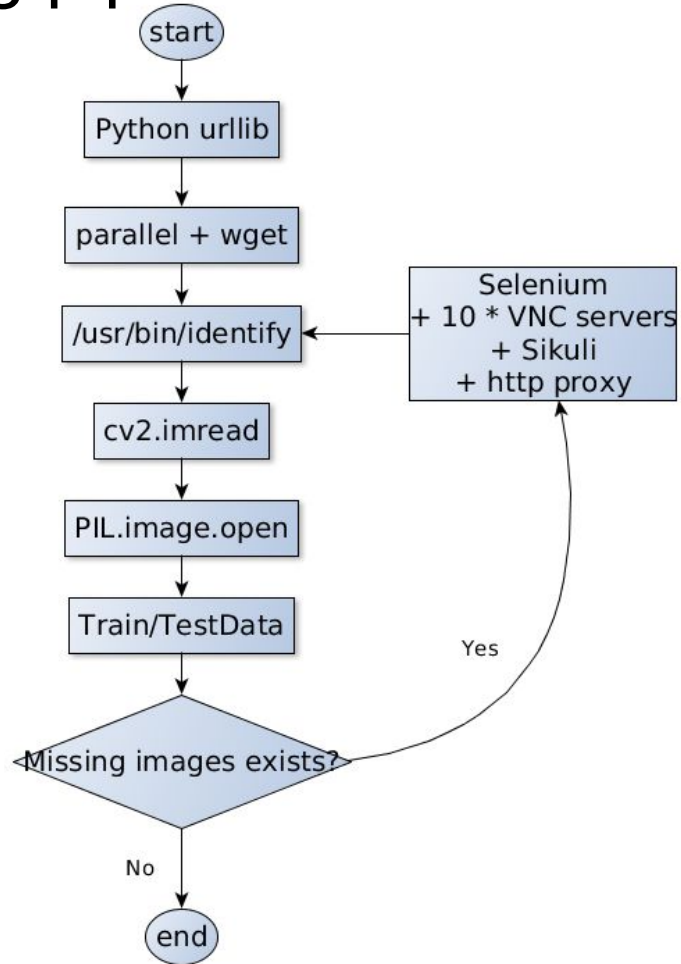


Image downloading pipeline



6 days before the end of the competition



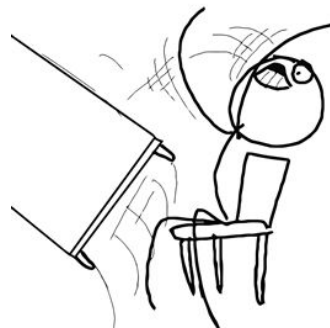
Richardaecn

Download link for the dataset

posted in [iMaterialist Challenge at FGVC 2017](#) a month ago



Please find the download link in the github page: https://github.com/visipedia/imat_comp. Those are crawled from URLs. Due to broken URLs, number of missing images are 1635 / 42029 (3.89%) in training, 298 / 8432 (3.53%) in validation and 1321 / 33726 (3.92%) in test set.

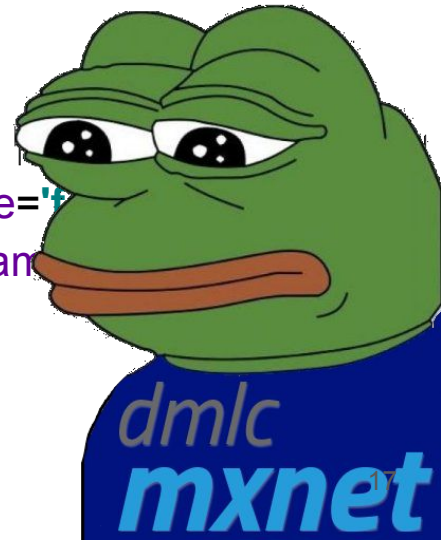


Обучение нейросети

```
import mxnet as mx
```

```
symbol = internals["flatten0_output"]  
symbol = mx.symbol.FullyConnected(data=symbol, num_hidden=381, name='fc')  
symbol = mx.symbol.LogisticRegressionOutput(data=symbol, name='softmax')
```

```
symbol = internals["flatten0_output"]  
symbol = mx.symbol.FullyConnected(data=symbol, num_hidden=381, name='fc')  
symbol = mx.symbol.SoftmaxOutput(data=symbol, multi_output = True, name='softmax')
```



Keras, который смог

```
input_tensor = Input(shape=(224, 224, 3))  
base_model = ResNet50(input_tensor=input_tensor, weights='imagenet', include_top=False)
```

```
x = base_model.output  
x = GlobalAveragePooling2D()(x)  
x = Dropout(0.5)(x)
```

```
predictions = Dense(381, activation='sigmoid')(x)  
model = Model(inputs=base_model.input, outputs=predictions)
```

```
model.compile(optimizer='adam', loss='binary_crossentropy')
```

```
model.compile(optimizer='adam', loss='categorical_crossentropy')
```



Обычный finetune

- Обучение только FC слоев первые ~2 эпохи
- Adam с понижением LR после выхода на плато по loss
- Аугментации:
Crop, Mirror, Scale, Rotate, Shear, Noise, Gauss, Contrast
<https://github.com/aleju/imgaug>
- 10 Stratify folds
- ResNet-50, Inception v3, Xception

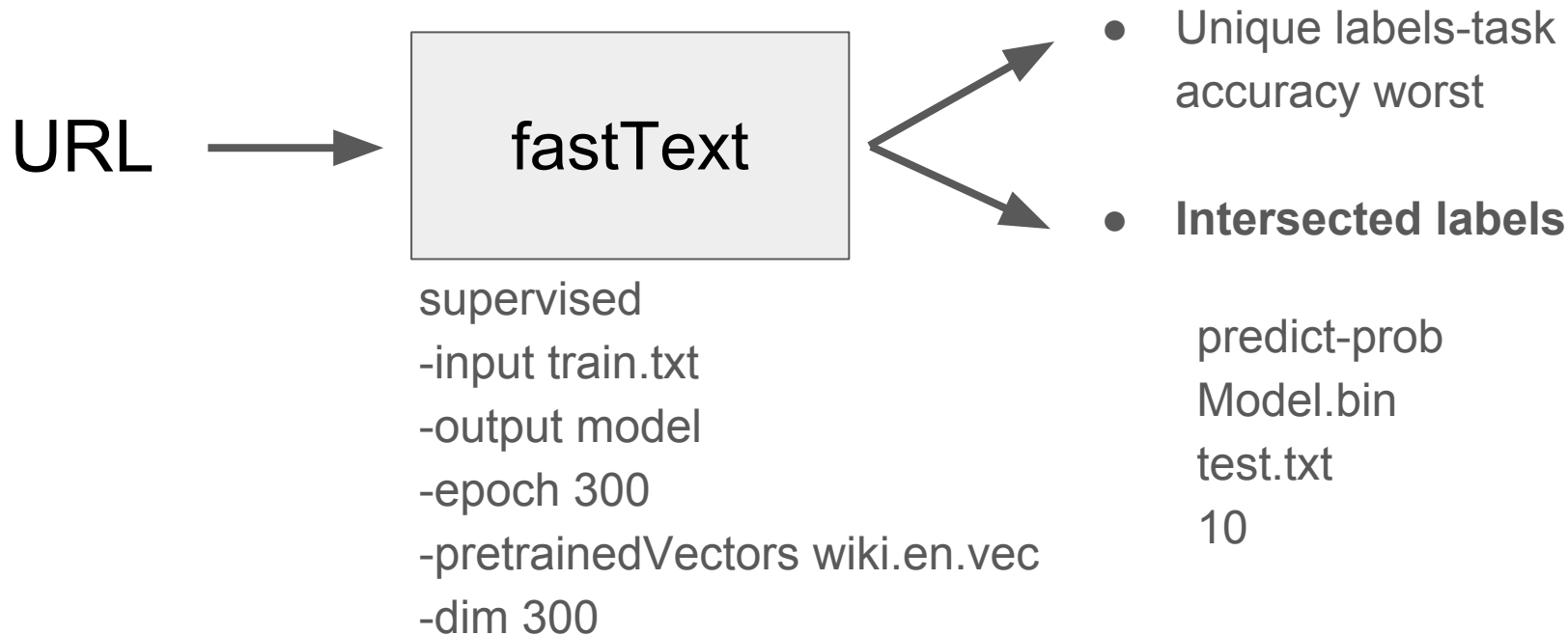
Data Leak

<http://www.bluemaize.net/im/dresses/dress-midi-10.jpg>

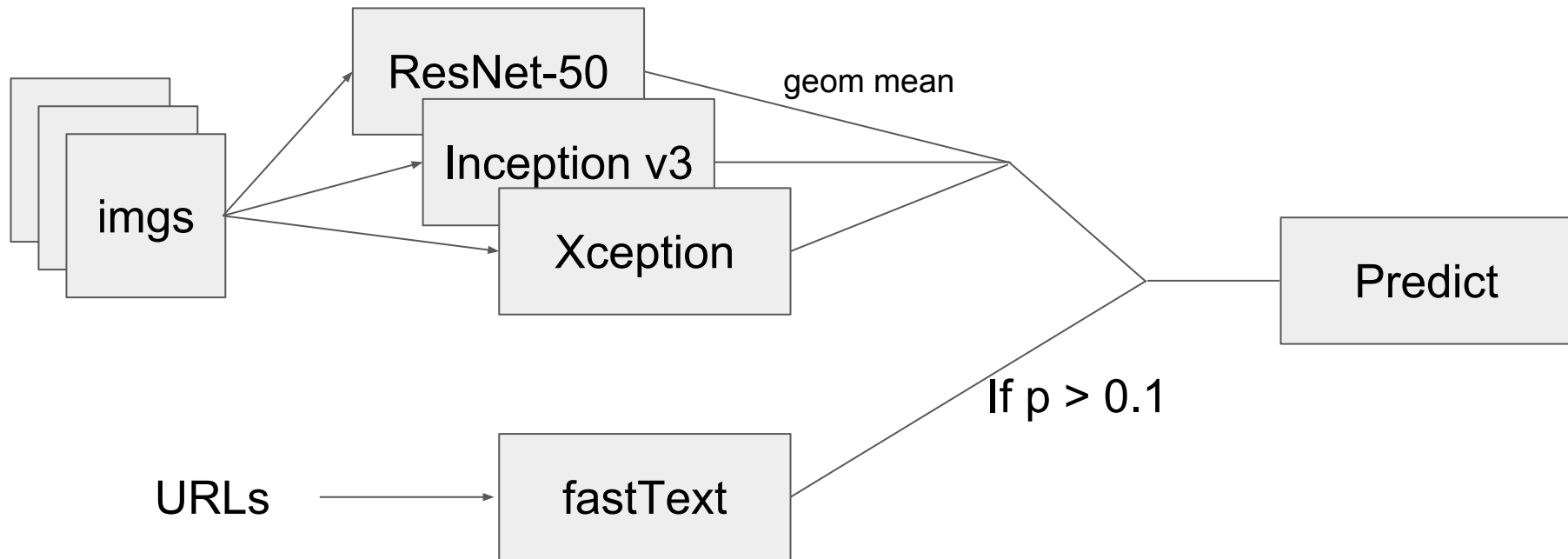
<http://ringgeneralboxing.com/catalog/images/Adidas%20Response%20II%20Wrestling%20Shoes%20Red.jpg>

<http://www.bluemaize.net/im/baby-boys-clothing-shoes/the-north-face-boys-10.jpg>











Text model



Model Merge



Results

1	—	DressCoder	  	0.30117	10	16d
2	—	Cloth.AI	 	0.35013	83	16d
3	—	ModeMaschinenMensch		0.38378	10	16d
4	—	ds	 ●●●●●	0.39506	67	16d
5	—	Adrian Lopez	 ●	0.40231	14	20d
6	—	Costume.ai	  ●●●●● ●●●●●	0.44236	16	16d

Submission and Description	Private Score	Public Score	Use for Final Score
f_subm_1499703587.csv 13 days ago by Dmitry Kozlov	0.34825	0.35500	<input type="checkbox"/>