Egocentric Height Estimation

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Weekly Update 6/28-7/1
Edge Boundary Histograms

- Trained SVM on EBH
- 1x320 vector per image
- Both linear and polynomial kernels predicted all the same answer
Training SVM on HOF

- Trained SVM on Histograms of Oriented Optical Flow
- Harder to write the training labels

<table>
<thead>
<tr>
<th>Linear</th>
<th>Polynomial</th>
</tr>
</thead>
<tbody>
<tr>
<td>.6062</td>
<td>.3524</td>
</tr>
</tbody>
</table>
Optical-Flow based CNN

- Using sparse OF based CNN from Poleg, Arora, and Peleg

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Sigmoid Median normalization</th>
<th>Tanh median</th>
<th>Sigmoid mean</th>
<th>Sigmoid fit (0,1)</th>
<th>Sigmoid mean + exp / e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest</td>
<td>121</td>
<td>154.62</td>
<td>249.24</td>
<td><strong>146.22</strong></td>
<td>150.92</td>
<td>208.86</td>
</tr>
<tr>
<td>Waist</td>
<td>99</td>
<td><strong>129.59</strong></td>
<td>145.26</td>
<td>142.82</td>
<td>134.83</td>
<td>150.54</td>
</tr>
<tr>
<td>Head</td>
<td>166</td>
<td>144.69</td>
<td>247.96</td>
<td>148.05</td>
<td><strong>164.09</strong></td>
<td>219.81</td>
</tr>
</tbody>
</table>
Two-stream CNN

- Based on paper by Karen Simonyan and Andrew Zisserman
- Take pre-trained Alexnet and make it regression-based
- Take their temporal-based CNN → regression-based
- Two ways of yielding results
  - Train SVM on concatenated results
  - Average results