A Dual-Source Approach for 3D Pose Estimation from a Single Image
Supplementary Material

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1. Qualitative Results

We present some qualitative results for the Human3.6M dataset [2] as well as Leeds Sports pose dataset [3]. Human3.6M dataset contains images captured in an indoor environment while Leeds Sports pose dataset consists of realistic images taken from the internet. For experiments on Leeds Sports pose dataset we train our regression forests and pictorial structure model using 1000 training images provided with the dataset, and use CMU motion capture dataset to develop our motion capture database. A few examples of resulting 3D pose estimates for both datasets are shown in Figure 1 and Figure 2, respectively. As evident in Figure 1 and Figure 2, our approach shows very good performance even for highly articulated poses, and also for images captured in unconstrained environments.

2. CMU Motion Capture Dataset

In Table 1 we provide details about the sequences taken from CMU motion capture dataset in order to develop our motion capture database used in this paper. We downsample these sequences from 120 Hz to 30 Hz that results in 360K poses for our CMU motion capture database.

References

[1] CMU. Carnegie mellon university graphics lab: Motion capture database, 2014. mocap.cs.cmu.edu
[2] C. Ionescu, D. Papava, V. Olaru, and C. Sminchisescu. Human3.6m: Large scale datasets and predictive methods for 3d human sensing in natural environments. TPAMI, 2014.
[3] S. Johnson and M. Everingham. Clustered pose and non-linear appearance models for human pose estimation. In BMVC, 2010.

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Figure 1: A few qualitative results from Human3.6M dataset [2]: (a) represents input images, (b) shows refined 2D poses while (c) and (d) correspond to estimated 3D poses from two different views.
Figure 2: A few qualitative results from Leeds Sports pose dataset [3]: (a) represents input images, (b) shows refined 2D poses while (c) and (d) correspond to estimated 3D poses from two different views.
| Subjects | Activities                                                                 | Number of Trails |
|----------|----------------------------------------------------------------------------|-----------------|
| 2        | Various expressions and human behaviors (walk, punch, bend over, rise, lift arm etc.) | 10              |
| 3        | Walk on uneven terrain                                                     | 4               |
| 7        | Walk                                                                       | 12              |
| 8        | Walk                                                                       | 11              |
| 9        | Run                                                                        | 12              |
| 13       | Various everyday behaviors (sit, stand up, boxing, climb ladder, sweep floor etc.) | 42              |
| 14       | Various everyday behaviors (direct traffic, wave, wash windows, jump up to grab etc.) | 37              |
| 15       | Various everyday behaviors, dance moves                                     | 14              |
| 16       | Run, jump, walk                                                            | 58              |
| 17       | Different walking styles                                                   | 10              |
| 18       | Human interaction and communication (2 subjects - subject A)               | 15              |
| 19       | Human interaction and communication (2 subjects - subject B)               | 15              |
| 20       | Human interaction - at play, formations (2 subjects - subject A)           | 13              |
| 21       | Human interaction - at play, formations (2 subjects - subject B)           | 13              |
| 33       | Throw and catch football (2 subjects - subject A)                          | 2               |
| 34       | Throw and catch football (2 subjects - subject B)                          | 2               |
| 35       | Walk, run                                                                  | 34              |
| 36       | Walk on uneven terrain                                                     | 37              |
| 37       | Walk                                                                       | 1               |
| 38       | Walk, run around in a circle                                               | 4               |
| 45       | Walk                                                                       | 1               |
| 46       | Walk                                                                       | 1               |
| 47       | Walk                                                                       | 1               |
| 69       | Walking (walk sideways and turn, walk backwards and turn, walk and turn etc.) | 75              |
| 81       | Pushing a box; jumping off a ledge; walks                                  | 18              |
| 82       | Jumping; pushing; emotional walks                                          | 18              |
| 91       | Walks and turns                                                            | 62              |
| 104      | Motion (jog, excited walk, slow walk, run through etc.)                    | 57              |
| 105      | Motion (traffic walk, depressed walk, jump forward, jump turn, small jump etc.) | 62              |
| 107      | Walking with obstacles 1                                                   | 14              |
| 108      | Walking with obstacles 2                                                  | 28              |
| 115      | Bending over                                                               | 10              |
| 123      | Carry Suitcase with Varying Weights                                        | 13              |
| 132      | Varying Weird Walks                                                       | 56              |
| 138      | Marching, Walking and Talking                                             | 55              |
| 139      | Action Walks, sneaking, wounded, looking around                            | 34              |
| 140      | Getting Up From Ground                                                    | 9               |
| 141      | General Subject Capture                                                    | 34              |
| 142      | Stylized Walks                                                            | 22              |
| 143      | General Subject Capture                                                    | 42              |

Table 1: List of sequences taken from CMU motion capture dataset [1] used in our experiments.