Supplementary Material

MeshMonk: open-source large-scale intensive 3D phenotyping

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# Supplementary Data

**Supplementary Table 1.** Descriptive data for the validation sample used. These data are included only to describe the variation present in the sample and were not used as covariates in statistical analyses.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ID | Sex | Age | Height (cm) | Weight (kg) | Self-identified population | Camera |
| 61549 | F | 33 | 155.00 | 48.00 | Admixed African and European | 2006, 2-pod |
| 61587 | F | 20 | 158.00 | 43.00 | Italian | 2006, 2-pod |
| 61622 | M | 21 | 175.00 | 71.99 | Italian | 2006, 2-pod |
| 62102 | M | 22 | 178.00 | 60.01 | Polish | 2006, 2-pod |
| 62588 | M | 21 | 172.00 | 57.02 | Portuguese | 2006, 2-pod |
| 62633 | M | 41 | 176.00 | 76.02 | Portuguese | 2006, 2-pod |
| 62659 | F | 28 | 169.00 | 57.02 | Portuguese | 2006, 2-pod |
| 62677 | M | 24 | 175.00 | 65.00 | Portuguese | 2006, 2-pod |
| 62695 | F | 30 | 165.00 | 66.00 | Portuguese | 2006, 2-pod |
| 63096 | F | 20 | 165.10 | 57.15 | Irish | 2006, 2-pod |
| 63123 | F | 27 | 165.00 | 57.15 | Irish | 2006, 2-pod |
| 63151 | F | 43 | 165.10 | 69.85 | Irish | 2006, 2-pod |
| 63156 | M | 19 | 184.00 | 60.33 | Irish | 2006, 2-pod |
| 63173 | M | 19 | 180.00 | 66.00 | Irish | 2006, 2-pod |
| 131213 | M | 23 | 172.55 | 72.85 | Broadly European | 2013, 2-pod |
| 140241 | F | 33 | 160.70 | 57.40 | Unknown | 2014, 3-pod |
| 140268 | M | 19 | 179.00 | 103.80 | Mixed European and European American | 2014, 3-pod |
| 140679 | M | 62 | 166.00 | 63.30 | Mixed European and European American | 2014, 3-pod |
| 140721 | F | 26 | 165.00 | 101.30 | Mixed European and European American | 2014, 3-pod |
| 140739 | F | 73 | 169.00 | 83.00 | Mixed European and European American | 2014, 3-pod |
| 140956 | M | 21 | 168.60 | 70.80 | Broadly European | 2014, 3-pod |
| 141280 | F | 79 | 149.86 | 70.31 | Broadly European | 2014, 3-pod |
| 141527 | F | 66 | 170.18 | 97.07 | Mixed European and European American | 2014, 3-pod |
| 141563 | F | 24 | 154.94 | 52.16 | Mixed European and European American | 2014, 3-pod |
| 141706 | F | 63 | 170.18 | 81.65 | Broadly European | 2014, 3-pod |
| 141713 | F | 53 | 162.56 | 86.18 | Broadly European | 2014, 3-pod |
| 141869 | F | 25 | 152.40 | 46.72 | Mixed European and European American | 2014, 3-pod |
| 141875 | F | 55 | 165.10 | 62.60 | Mixed European and European American | 2014, 3-pod |
| 141913 | F | 20 | 162.56 | 68.04 | Mixed European and European American | 2014, 3-pod |
| 141979 | F | 65 | 157.48 | 54.43 | Mixed European and European American | 2014, 3-pod |
| 143007 | F | 27 | 156.40 | 62.40 | Mixed European and European American | 2014, 3-pod |
| 143076 | F | 19 | 181.00 | 68.40 | Mixed European and European American | 2014, 3-pod |
| 143093 | F | 18 | 179.00 | 65.00 | Broadly European | 2014, 3-pod |
| 143126 | F | 20 | 162.30 | 98.90 | Broadly European | 2014, 3-pod |
| 143162 | F | 19 | 170.00 | 75.70 | Broadly European | 2014, 3-pod |
| 143221 | F | 53 | 164.00 | 50.80 | Mixed European, Jewish | 2014, 3-pod |
| 143235 | F | 22 | 169.90 | 55.00 | Mixed European and European American | 2014, 3-pod |
| 143340 | M | 28 | 174.00 | 65.30 | Broadly European | 2014, 3-pod |
| 143578 | F | 23 | 161.00 | 78.20 | Broadly European | 2014, 3-pod |
| 143651 | F | 19 | 162.00 | 59.40 | Mixed European, Jewish | 2014, 3-pod |
| 143670 | F | 21 | 164.60 | 67.20 | Mixed European and European American | 2014, 3-pod |

# Supplementary Figures and Tables

## Supplementary Figures

## Supplementary Tables

**Supplementary Table X**. Standard deviation of landmark iterations along the x, y, and z dimension, averaged across images for each landmark. The means of each observer as well as the inter-observer error are reported in Table X of the accompanying manuscript.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Landmark* | *Observer AJ* | | | | *Observer JW* | | | | *Inter-observer* | | | |
| *X* | *Y* | *Z* | *Mean* | *X* | *Y* | *Z* | *Mean* | *X* | *Y* | *Z* | *Mean* |
| *Alar curvature left* | 0.2069 | 0.6795 | 0.9196 | **0.6020** | 0.1471 | 0.5472 | 0.6074 | **0.4339** | 0.1222 | 0.3752 | 0.4227 | **0.3067** |
| *Alar curvature right* | 0.2076 | 0.7503 | 0.9333 | **0.6304** | 0.1327 | 0.4612 | 0.5379 | **0.3773** | 0.1219 | 0.3369 | 0.5273 | **0.3287** |
| *Chelion left* | 0.8601 | 0.5386 | 0.4255 | **0.6080** | 0.6703 | 0.3527 | 0.3184 | **0.4472** | 0.5948 | 0.2965 | 0.3631 | **0.4182** |
| *Chelion right* | 0.8074 | 0.4917 | 0.5016 | **0.6002** | 0.7412 | 0.3465 | 0.3924 | **0.4934** | 0.4269 | 0.2712 | 0.1971 | **0.2984** |
| *Crista philtri left* | 0.5461 | 0.6676 | 0.2912 | **0.5016** | 0.4327 | 0.2984 | 0.1812 | **0.3041** | 0.5169 | 0.4584 | 0.1890 | **0.3881** |
| *Crista philtri right* | 0.5518 | 0.7146 | 0.3409 | **0.5358** | 0.4654 | 0.2520 | 0.1671 | **0.2949** | 0.6536 | 0.5698 | 0.1976 | **0.4737** |
| *Endocanthion left* | 0.9219 | 0.6269 | 0.6852 | **0.7447** | 0.5506 | 0.3861 | 0.3749 | **0.4372** | 0.5882 | 0.3286 | 0.3917 | **0.4362** |
| *Endocanthion right* | 1.1879 | 0.5003 | 0.6209 | **0.7697** | 0.5617 | 0.3647 | 0.4121 | **0.4462** | 0.4828 | 0.2689 | 0.3306 | **0.3608** |
| *Exocanthion left* | 0.6899 | 0.5058 | 0.5631 | **0.5863** | 0.5032 | 0.4039 | 0.4069 | **0.4380** | 0.3635 | 0.2705 | 0.2498 | **0.2946** |
| *Exocanthion right* | 0.7402 | 0.5897 | 0.6330 | **0.6543** | 0.4346 | 0.2882 | 0.3507 | **0.3579** | 0.3524 | 0.2374 | 0.2668 | **0.2855** |
| *Glabella* | 0.5627 | 0.8658 | 0.2998 | **0.5761** | 0.4532 | 1.1696 | 0.4414 | **0.6881** | 0.4175 | 0.6913 | 0.2536 | **0.4542** |
| *Labiale inferius* | 0.5214 | 0.6100 | 0.3782 | **0.5032** | 0.4183 | 0.3355 | 0.1987 | **0.3175** | 0.5355 | 0.8468 | 0.3749 | **0.5857** |
| *Labiale superius* | 0.4673 | 0.5861 | 0.2228 | **0.4254** | 0.2968 | 0.3757 | 0.1274 | **0.2666** | 0.3752 | 0.4534 | 0.1269 | **0.3185** |
| *Nasion* | 0.3302 | 0.9321 | 0.3471 | **0.5365** | 0.3132 | 0.8478 | 0.4595 | **0.5402** | 0.3891 | 0.8151 | 0.2772 | **0.4938** |
| *Pogonion* | 0.6464 | 1.2742 | 0.5419 | **0.8208** | 0.6220 | 1.1558 | 0.5000 | **0.7593** | 0.7110 | 0.7572 | 0.3278 | **0.5987** |
| *Pronasale* | 0.4185 | 0.7104 | 0.2491 | **0.4593** | 0.2994 | 0.4423 | 0.2053 | **0.3157** | 0.2896 | 0.4927 | 0.2147 | **0.3323** |
| *Subalare left* | 0.5524 | 0.3630 | 0.5900 | **0.5018** | 0.5157 | 0.3075 | 0.4553 | **0.4262** | 0.4764 | 0.2554 | 0.4697 | **0.4005** |
| *Subalare right* | 0.5767 | 0.3144 | 0.5739 | **0.4883** | 0.6422 | 0.3214 | 0.4909 | **0.4848** | 0.4979 | 0.3147 | 0.4723 | **0.4283** |
| *Subnasale* | 0.3765 | 0.6527 | 0.3219 | **0.4504** | 0.3342 | 0.7196 | 0.3546 | **0.4695** | 0.1766 | 0.5530 | 0.3143 | **0.3480** |
| *Mean* | **0.5880** | **0.6512** | **0.4968** | **0.5787** | **0.4492** | **0.4935** | **0.3675** | **0.4367** | **0.4259** | **0.4523** | **0.3141** | **0.3974** |