**Ranking regions by importance**

|  |  |
| --- | --- |
| **Region** | Importance |
| rightCheek | 13.185529043730323 |
| leftCheek | 10.899566013665634 |
| lipsLowerInner | 9.100965172896105 |
| lipsUpperOuter | 7.773397092570438 |
| lipsLowerOuter | 7.622373382230087 |
| lipsUpperInner | 7.289243873772159 |
| rightEyeLower3 | 3.0297311979700563 |
| leftEyeLower3 | 2.797271519546465 |
| rightEyeLower2 | 2.7778012948366153 |
| leftEyeLower2 | 2.581363450991319 |
| rightEyeLower1 | 2.576722696535785 |
| leftEyeLower1 | 2.516105341310742 |
| leftEyeLower0 | 2.5096361646144447 |
| rightEyebrowUpper | 2.4912076742651323 |
| rightEyeLower0 | 2.484111676044333 |
| leftEyebrowUpper | 2.4257907252044713 |
| rightEyeUpper2 | 2.0339041589411777 |
| rightEyeUpper0 | 2.0291509593952575 |
| leftEyeUpper0 | 1.9851840578149267 |
| leftEyeUpper2 | 1.9754365591992453 |
| rightEyeUpper1 | 1.9548655021044774 |
| leftEyeUpper1 | 1.8987057751578447 |
| rightEyebrowLower | 1.854946926118928 |
| leftEyebrowLower | 1.7446692610127097 |
| noseBottom | 0.7810372070078372 |
| noseRightCorner | 0.712552299245978 |
| noseLeftCorner | 0.6504453327462727 |
| midwayBetweenEyes | 0.31828564107123536 |
| noseTip | 0.0 |

**Training data by top N regions out of 29**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Metric** | Top 5 Regions | Top 10 Regions | Top 15 Regions | Top 20 Regions | Top 25 Regions |
| Max Accuracy | 0.93 | 0.925 | 0.915 | 0.915 | 0.9125 |
| Min Accuracy | 0.8975 | 0.8875 | 0.8875 | 0.88 | 0.875 |
| Avg Accuracy | 0.9147 | 0.9077 | 0.9027 | 0.8977 | 0.8945 |
| Accuracy | 0.93 | 0.93 | 0.92 | 0.92 | 0.91 |
| F1 | 0.93 | 0.92 | 0.91 | 0.91 | 0.91 |
| Precision | 0.93 | 0.93 | 0.92 | 0.92 | 0.91 |
| Recall | 0.93 | 0.93 | 0.92 | 0.91 | 0.91 |

**Ranking indexes(features) by importance**

|  |  |
| --- | --- |
| **Feature** | **Importance** |
| **lipsLowerInner\_178** | 0.951909 |
| lipsLowerInner\_87 | 0.902309 |
| lipsLowerInner\_88 | 0.887116 |
| lipsLowerInner\_14 | 0.885148 |
| rightCheek\_138 | 0.878575 |
| rightCheek\_215 | 0.864195 |
| lipsLowerInner\_317 | 0.854655 |
| lipsLowerInner\_95 | 0.839322 |
| lipsUpperOuter\_40 | 0.835142 |
| rightCheek\_135 | 0.83244 |
| lipsLowerOuter\_146 | 0.826076 |
| lipsUpperOuter\_39 | 0.820478 |
| lipsLowerOuter\_91 | 0.818713 |
| rightCheek\_169 | 0.817867 |
| lipsUpperOuter\_185 | 0.804801 |
| lipsLowerOuter\_181 | 0.801729 |
| lipsUpperOuter\_61 | 0.801552 |
| rightCheek\_192 | 0.798906 |
| noseBottom\_2 | 0.798609 |
| lipsUpperInner\_78 | 0.779309 |
| lipsLowerInner\_402 | 0.778403 |
| lipsUpperInner\_80 | 0.771671 |
| lipsLowerOuter\_321 | 0.764704 |
| lipsLowerInner\_318 | 0.762623 |
| lipsLowerInner\_78 | 0.754827 |
| lipsUpperInner\_191 | 0.74072 |
| rightCheek\_210 | 0.731633 |
| lipsLowerOuter\_375 | 0.730951 |
| lipsLowerOuter\_314 | 0.730862 |
| lipsLowerOuter\_84 | 0.728861 |
| rightCheek\_214 | 0.72738 |
| lipsLowerOuter\_405 | 0.726225 |
| rightCheek\_216 | 0.719341 |
| lipsLowerOuter\_17 | 0.716832 |
| lipsUpperOuter\_291 | 0.712059 |
| lipsLowerOuter\_291 | 0.710983 |
| lipsUpperOuter\_37 | 0.71014 |
| noseRightCorner\_98 | 0.710052 |
| lipsLowerInner\_324 | 0.702428 |
| rightCheek\_177 | 0.697834 |
| rightCheek\_213 | 0.696615 |
| leftCheek\_364 | 0.691572 |
| leftCheek\_394 | 0.686468 |
| lipsUpperOuter\_270 | 0.686392 |
| lipsUpperInner\_308 | 0.684067 |
| rightCheek\_207 | 0.682204 |
| leftCheek\_416 | 0.677771 |
| lipsUpperInner\_81 | 0.676208 |
| lipsUpperOuter\_269 | 0.669955 |
| lipsLowerInner\_308 | 0.667949 |
| rightCheek\_212 | 0.663022 |
| lipsUpperOuter\_409 | 0.661573 |
| noseLeftCorner\_327 | 0.661416 |
| rightCheek\_203 | 0.652803 |
| lipsUpperInner\_415 | 0.640916 |
| rightCheek\_205 | 0.640315 |
| lipsUpperOuter\_0 | 0.639856 |
| rightCheek\_187 | 0.639806 |
| leftCheek\_422 | 0.633421 |
| leftCheek\_411 | 0.624412 |
| lipsUpperInner\_310 | 0.624014 |
| lipsUpperInner\_82 | 0.622249 |
| leftCheek\_376 | 0.618304 |
| leftCheek\_434 | 0.616176 |
| leftCheek\_430 | 0.613693 |
| leftCheek\_426 | 0.612467 |
| leftCheek\_423 | 0.611523 |
| lipsUpperInner\_311 | 0.611295 |
| lipsUpperOuter\_267 | 0.596988 |
| rightCheek\_147 | 0.584636 |
| leftCheek\_436 | 0.580247 |
| rightCheek\_137 | 0.57242 |
| lipsUpperInner\_312 | 0.571362 |
| leftCheek\_427 | 0.569174 |
| lipsUpperInner\_13 | 0.564563 |
| leftCheek\_432 | 0.564139 |
| leftCheek\_425 | 0.545876 |
| rightCheek\_50 | 0.52292 |
| rightCheek\_123 | 0.490552 |
| leftCheek\_280 | 0.479663 |
| leftCheek\_266 | 0.472968 |
| leftCheek\_352 | 0.457567 |
| leftCheek\_371 | 0.404841 |
| leftCheek\_330 | 0.382968 |
| rightEyeLower3\_117 | 0.378389 |
| rightEyeLower3\_143 | 0.375547 |
| rightEyeLower3\_118 | 0.374516 |
| rightEyeLower3\_119 | 0.360738 |
| rightEyeLower3\_111 | 0.359787 |
| rightEyebrowUpper\_107 | 0.354659 |
| leftEyebrowUpper\_336 | 0.350951 |
| rightEyebrowLower\_35 | 0.348032 |
| rightEyeLower2\_31 | 0.345599 |
| rightEyeLower2\_228 | 0.338844 |
| leftEyebrowUpper\_285 | 0.332185 |
| leftEyeLower3\_348 | 0.330517 |
| rightEyebrowUpper\_55 | 0.330498 |
| leftEyeLower3\_372 | 0.330411 |
| rightEyebrowLower\_52 | 0.327434 |
| leftEyeLower3\_347 | 0.32701 |
| rightEyeLower2\_229 | 0.326757 |
| leftEyeLower3\_340 | 0.32673 |
| rightEyebrowUpper\_66 | 0.326664 |
| leftEyeLower3\_346 | 0.325926 |
| leftEyebrowUpper\_296 | 0.322014 |
| rightEyeLower2\_226 | 0.321046 |
| rightEyebrowLower\_65 | 0.320764 |
| leftEyeLower3\_349 | 0.319107 |
| midwayBetweenEyes\_168 | 0.318765 |
| rightEyeLower3\_120 | 0.318762 |
| rightEyeLower1\_130 | 0.314765 |
| rightEyeLower1\_25 | 0.314731 |
| leftEyebrowLower\_295 | 0.314463 |
| rightEyebrowUpper\_156 | 0.312375 |
| rightEyeLower2\_230 | 0.311435 |
| rightEyebrowUpper\_193 | 0.310581 |
| leftEyeLower2\_448 | 0.308779 |
| leftEyebrowLower\_283 | 0.302359 |
| rightEyeUpper0\_246 | 0.301853 |
| rightEyeUpper0\_160 | 0.301768 |
| rightEyeUpper2\_113 | 0.300657 |
| leftEyebrowLower\_265 | 0.300253 |
| rightEyeLower3\_121 | 0.300093 |
| leftEyeLower2\_446 | 0.299906 |
| rightEyeLower1\_110 | 0.299453 |
| leftEyebrowLower\_282 | 0.298958 |
| leftEyebrowUpper\_293 | 0.298655 |
| rightEyeLower0\_33 | 0.29827 |
| leftEyeLower2\_450 | 0.298237 |
| rightEyebrowUpper\_105 | 0.297814 |
| rightEyeUpper2\_221 | 0.297098 |
| rightEyeLower0\_163 | 0.296784 |
| leftEyebrowUpper\_417 | 0.296512 |
| rightEyeUpper0\_161 | 0.296264 |
| leftEyeUpper2\_444 | 0.295416 |
| rightEyeUpper0\_159 | 0.295364 |
| rightEyeUpper1\_247 | 0.294737 |
| rightEyeUpper2\_222 | 0.293892 |
| rightEyeUpper2\_223 | 0.293263 |
| leftEyeUpper1\_467 | 0.292394 |
| leftEyeLower1\_256 | 0.292365 |
| leftEyeLower2\_449 | 0.291901 |
| leftEyeLower2\_261 | 0.291634 |
| leftEyebrowUpper\_334 | 0.291498 |
| leftEyeUpper2\_442 | 0.291293 |
| rightEyebrowLower\_124 | 0.290663 |
| leftEyeUpper0\_386 | 0.290274 |
| rightEyeLower2\_231 | 0.290124 |
| leftEyebrowUpper\_300 | 0.289113 |
| leftEyeUpper2\_413 | 0.289039 |
| leftEyeLower1\_255 | 0.288729 |
| rightEyebrowUpper\_63 | 0.288474 |
| rightEyeLower1\_24 | 0.288092 |
| leftEyeLower2\_451 | 0.287704 |
| rightEyeUpper0\_158 | 0.287466 |
| leftEyeUpper0\_387 | 0.287194 |
| leftEyeUpper0\_466 | 0.286932 |
| rightEyeUpper1\_190 | 0.286624 |
| leftEyeLower3\_350 | 0.286466 |
| rightEyeUpper1\_29 | 0.286389 |
| rightEyeLower0\_7 | 0.286263 |
| leftEyeLower0\_249 | 0.286036 |
| rightEyeUpper1\_28 | 0.285847 |
| rightEyebrowLower\_53 | 0.285846 |
| rightEyebrowLower\_46 | 0.285693 |
| leftEyeUpper2\_443 | 0.285609 |
| leftEyeUpper0\_388 | 0.284649 |
| leftEyeLower3\_465 | 0.283992 |
| rightEyeUpper0\_173 | 0.283511 |
| rightEyeLower1\_23 | 0.283156 |
| rightEyeUpper1\_30 | 0.282861 |
| rightEyeLower3\_245 | 0.282677 |
| leftEyeLower0\_263 | 0.282407 |
| rightEyeUpper0\_157 | 0.281366 |
| leftEyeUpper1\_259 | 0.281106 |
| rightEyeLower0\_154 | 0.280799 |
| leftEyeLower2\_452 | 0.280725 |
| rightEyeUpper2\_225 | 0.280718 |
| leftEyeUpper1\_260 | 0.280117 |
| rightEyeUpper2\_224 | 0.280094 |
| leftEyebrowUpper\_383 | 0.278291 |
| leftEyeLower1\_254 | 0.277978 |
| leftEyeLower1\_341 | 0.277696 |
| rightEyebrowUpper\_70 | 0.277578 |
| leftEyeLower0\_381 | 0.277448 |
| leftEyeLower3\_357 | 0.277191 |
| rightEyeLower1\_243 | 0.276992 |
| rightEyeUpper1\_27 | 0.276703 |
| rightEyeLower0\_144 | 0.276339 |
| leftEyeLower2\_453 | 0.275968 |
| leftEyebrowLower\_353 | 0.275582 |
| leftEyeLower0\_380 | 0.275113 |
| leftEyeLower1\_253 | 0.274816 |
| rightEyeUpper1\_56 | 0.274812 |
| leftEyeLower1\_252 | 0.274312 |
|  |  |
|  |  |
| rightEyeLower2\_244 | 0.273305 |
| leftEyeUpper0\_385 | 0.272665 |
| leftEyeLower0\_362 | 0.272271 |
| leftEyeUpper0\_398 | 0.272121 |
| leftEyeLower1\_463 | 0.272095 |
| leftEyeLower1\_339 | 0.271966 |
| rightEyeLower1\_22 | 0.271622 |
| leftEyeUpper0\_384 | 0.271411 |
| rightEyeLower0\_133 | 0.271365 |
| leftEyeLower2\_464 | 0.271342 |
| rightEyeLower2\_233 | 0.271288 |
| leftEyeUpper1\_258 | 0.270468 |
| leftEyeUpper1\_257 | 0.270281 |
| rightEyeLower0\_145 | 0.269396 |
| leftEyeLower0\_390 | 0.269204 |
| rightEyeLower2\_232 | 0.269187 |
| rightEyeUpper2\_189 | 0.268658 |
| rightEyeLower0\_153 | 0.268537 |
| leftEyeUpper2\_441 | 0.268475 |
| leftEyeLower0\_374 | 0.268159 |
| leftEyeUpper2\_342 | 0.267678 |
| rightEyeLower0\_155 | 0.26753 |
| rightEyeLower1\_26 | 0.267361 |
| leftEyebrowLower\_276 | 0.267315 |
| leftEyeLower0\_382 | 0.267264 |
| rightEyeLower3\_128 | 0.266967 |
| leftEyeLower1\_359 | 0.266477 |
| leftEyeUpper2\_445 | 0.265565 |
| leftEyeUpper1\_414 | 0.264266 |
| leftEyeLower0\_373 | 0.260108 |
| leftEyeUpper1\_286 | 0.256477 |
| rightEyeLower1\_112 | 0.25341 |
| noseTip\_1 | 0 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Top Indexes** | Max | Min | Avg |
| 5 | 0.9075 | 0.878 | 0.8946 |
| 10 | 0.9125 | 0.885 | 0.9008 |
| 15 | 0.91 | 0.89 | 0.9009 |
| 20 | 0.9125 | 0.888 | 0.9015 |
| 25 | 0.915 | 0.89 | 0.9053 |
| 30 | 0.92 | 0.895 | 0.906 |
| 35 | 0.9175 | 0.893 | 0.9051 |
| 40 | 0.92 | 0.9 | 0.9102 |
| 45 | 0.9275 | 0.895 | 0.9091 |
| 50 | 0.925 | 0.898 | 0.9101 |
| 55 | 0.925 | 0.903 | 0.9142 |
| 60 | 0.9275 | 0.9 | 0.9152 |
| 65 | 0.93 | 0.903 | 0.9148 |
| 70 | 0.925 | 0.895 | 0.9143 |
| 75 | 0.9275 | 0.9 | 0.915 |
| 80 | 0.93 | 0.9 | 0.9143 |
| 85 | 0.925 | 0.9 | 0.9153 |
| 90 | 0.925 | 0.905 | 0.9134 |
| 95 | 0.9275 | 0.903 | 0.9152 |
| 100 | 0.9275 | 0.898 | 0.9128 |
| 105 | 0.925 | 0.895 | 0.9115 |
| 110 | 0.92 | 0.898 | 0.9086 |
| 115 | 0.925 | 0.895 | 0.9088 |
| 120 | 0.9225 | 0.895 | 0.909 |
| 125 | 0.9275 | 0.89 | 0.9082 |
| 130 | 0.9225 | 0.89 | 0.9062 |

Training data by top N Features out of 228