

# Recognizing Part Attributes with Insufficient Data

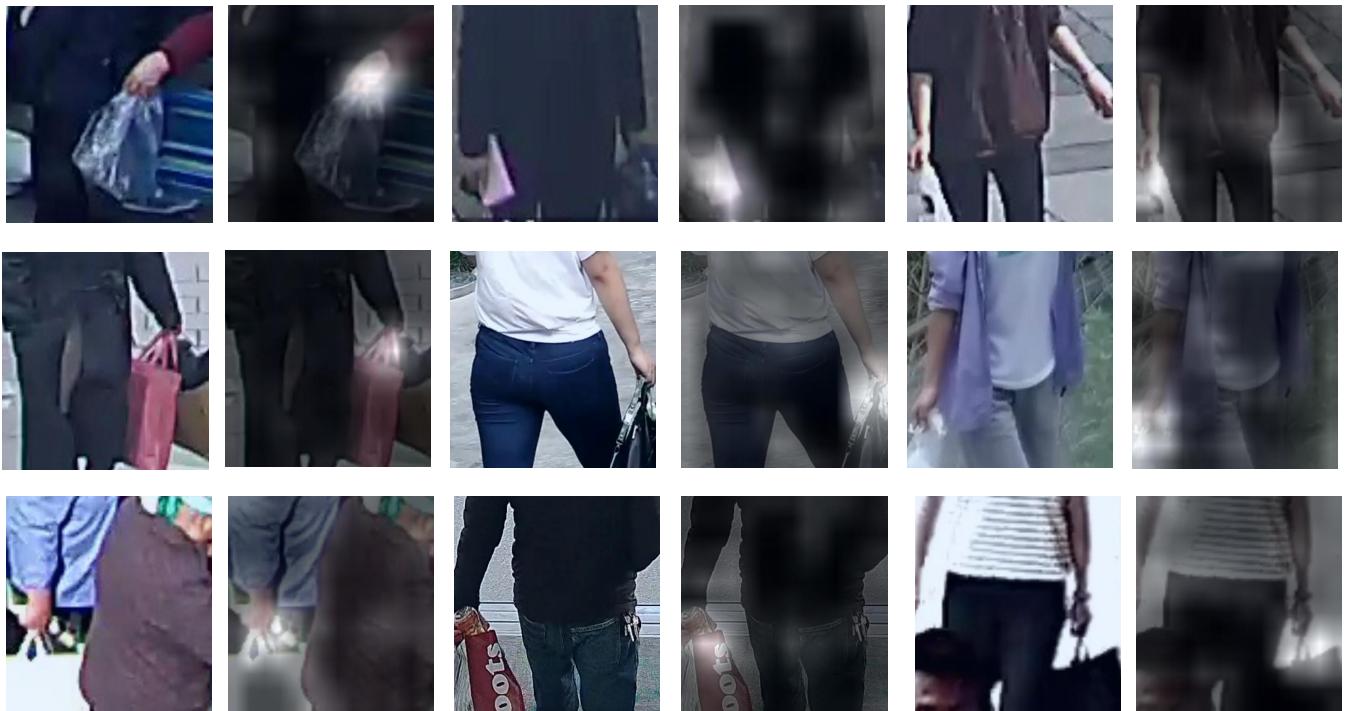
## Supplementary Materials

### 1. Experimental Attributes

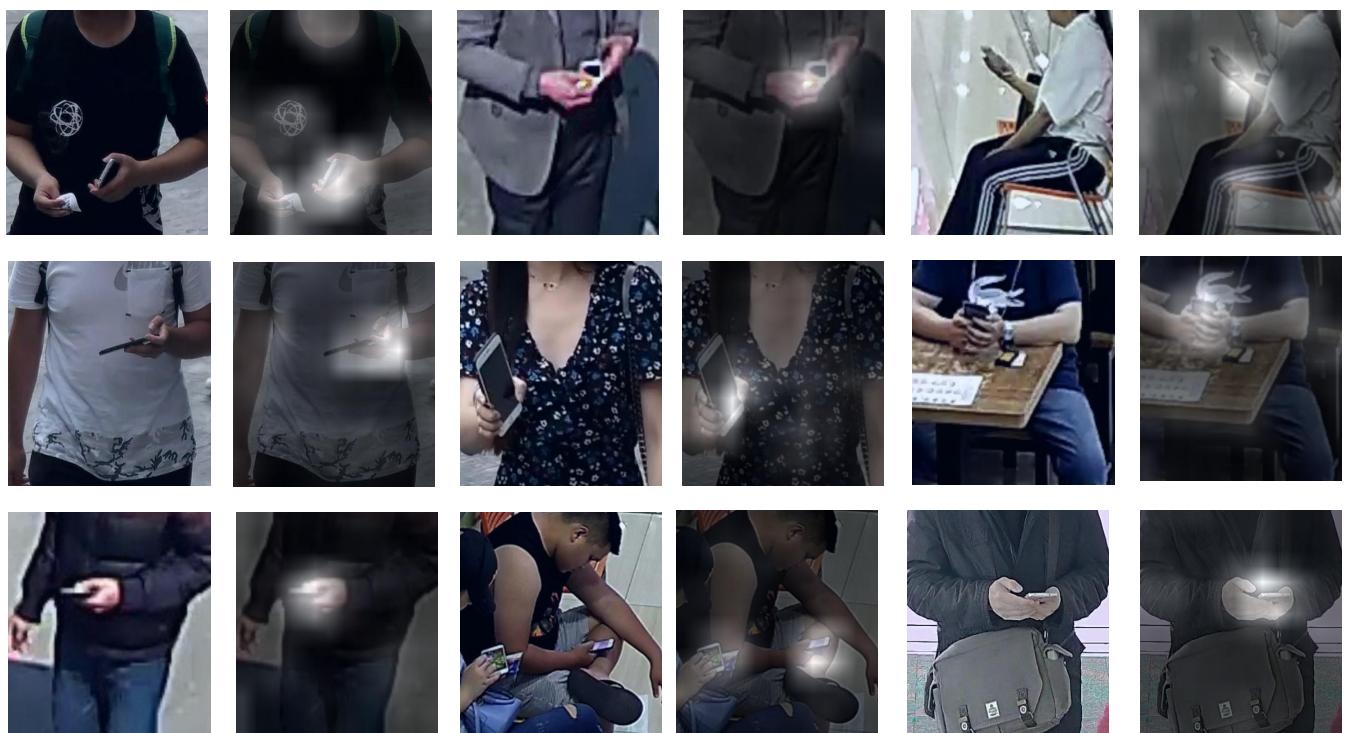
In Figure 5, we mentioned that we performed experiments on 204 attributes. The 1-204 attributes are: *1 curved\_(up\_or\_down)*, *2 bill\_dagger*, *3 bill\_hooked*, *4 bill\_needle*, *5 bill\_hooked\_seabird*, *6 bill\_spatulate*, *7 bill\_all-purpose*, *8 bill\_cone*, *9 bill\_specialized*, *10 wing\_blue*, *11 wing\_brown*, *12 wing\_iridescent*, *13 wing\_purple*, *14 wing\_rufous*, *15 wing\_grey*, *16 wing\_yellow*, *17 wing\_olive*, *18 wing\_green*, *19 wing\_pink*, *20 wing\_orange*, *21 wing\_black*, *22 wing\_white*, *23 wing\_red*, *24 wing\_buff*, *25 upperparts\_blue*, *26 upperparts\_brown*, *27 upperparts\_iridescent*, *28 upperparts\_purple*, *29 upperparts\_rufous*, *30 upperparts\_grey*, *31 upperparts\_yellow*, *32 upperparts\_olive*, *33 upperparts\_green*, *34 upperparts\_pink*, *35 upperparts\_orange*, *36 upperparts\_black*, *37 upperparts\_white*, *38 upperparts\_red*, *39 upperparts\_buff*, *40 underparts\_blue*, *41 underparts\_brown*, *42 underparts\_iridescent*, *43 underparts\_purple*, *44 underparts\_rufous*, *45 underparts\_grey*, *46 underparts\_yellow*, *47 underparts\_olive*, *48 underparts\_green*, *49 underparts\_pink*, *50 underparts\_orange*, *51 underparts\_black*, *52 underparts\_white*, *53 underparts\_red*, *54 underparts\_buff*, *55 breast\_solid*, *56 breast\_spotted*, *57 breast\_striped*, *58 breast\_multi-colored*, *59 head\_spotted*, *60 head\_malar*, *61 head\_crested*, *62 head\_masked*, *63 head\_unique\_pattern*, *64 head\_eyebrow*, *65 head\_eyering*, *66 head\_plain*, *67 head\_eyeline*, *68 head\_striped*, *69 head\_capped*, *70 breast\_blue*, *71 breast\_brown*, *72 breast\_iridescent*, *73 breast\_purple*, *74 breast\_rufous*, *75 breast\_grey*, *76 breast\_yellow*, *77 breast\_olive*, *78 breast\_green*, *79 breast\_pink*, *80 breast\_orange*, *81 breast\_black*, *82 breast\_white*, *83 breast\_red*, *84 breast\_buff*, *85 throat\_blue*, *86 throat\_brown*, *87 throat\_iridescent*, *88 throat\_purple*, *89 throat\_rufous*, *90 throat\_grey*, *91 throat\_yellow*, *92 throat\_olive*, *93 throat\_green*, *94 throat\_pink*, *95 throat\_orange*, *96 throat\_black*, *97 throat\_white*, *98 throat\_red*, *99 throat\_buff*, *100 eye\_blue*, *101 eye\_brown*, *102 eye\_purple*, *103 eye\_rufous*, *104 eye\_grey*, *105 eye\_yellow*, *106 eye\_olive*, *107 eye\_green*, *108 eye\_pink*, *109 eye\_orange*, *110 eye\_black*, *111 eye\_white*, *112 eye\_red*, *113 eye\_buff*, *114 bill\_length::about\_the\_same\_as\_head*, *115 bill\_length::longer\_than\_head*, *116 bill\_length::shorter\_than\_head*, *117 forehead\_color::blue*, *118 forehead\_color::brown*, *119 forehead\_color::iridescent*, *120 forehead\_purple*, *121 forehead\_rufous*, *122 forehead\_grey*, *123 forehead\_yellow*, *124 forehead\_olive*, *125 forehead\_green*, *126 forehead\_pink*, *127 forehead\_orange*, *128 forehead\_black*, *129 forehead\_white*, *130 forehead\_red*, *131 forehead\_buff*, *132 belly\_blue*, *133 belly\_brown*, *134 belly\_iridescent*, *135 belly\_purple*, *136 belly\_rufous*, *137 belly\_grey*, *138 belly\_yellow*, *139 belly\_olive*, *140 belly\_green*, *141 belly\_pink*, *142 belly\_orange*, *143 belly\_black*, *144 belly\_white*, *145 belly\_red*, *146 belly\_buff*, *147 wing\_rounded-wings*, *148 wing\_pointed-wings*, *149 wing\_broad-wings*, *150 wing\_tapered-wings*, *151 wing\_shape::long-wings*, *152 belly\_solid*, *153 belly\_spotted*, *154 belly\_striped*, *155 belly\_multi-colored*, *156 leg\_blue*, *157 leg\_brown*, *158 leg\_iridescent*, *159 leg\_purple*, *160 leg\_rufous*, *161 leg\_grey*, *162 leg\_yellow*, *163 leg\_olive*, *164 leg\_green*, *165 leg\_pink*, *166 leg\_orange*, *167 leg\_black*, *168 leg\_white*, *169 leg\_red*, *170 leg\_buff*, *171 bill\_blue*, *172 bill\_brown*, *173 bill\_iridescent*, *174 bill\_purple*, *175 bill\_rufous*, *176 bill\_grey*, *177 bill\_yellow*, *178 bill\_olive*, *179 bill\_green*, *180 bill\_pink*, *181 bill\_orange*, *182 bill\_black*, *183 bill\_white*, *184 bill\_red*, *185 bill\_buff*, *186 crown\_blue*, *187 crown\_brown*, *188 crown\_iridescent*, *189 crown\_purple*, *190 crown\_rufous*, *191 crown\_grey*, *192 crown\_yellow*, *193 crown\_olive*, *194 crown\_green*, *195 crown\_pink*, *196 crown\_orange*, *197 crown\_black*, *198 crown\_white*, *199 crown\_red*, *200 crown\_buff*, *201 wing\_solid*, *202 wing\_spotted*, *203 wing\_striped*, *204 wing\_multi-colored*.

### 2. Exemplar images

Following are some exemplar images of our human dataset and CUB bird dataset. The heat map placed on the right of each image visualizes the localization information predicted in the CSN inference process. The heat map is  $A'_i$  in line 299 and Figure 3.

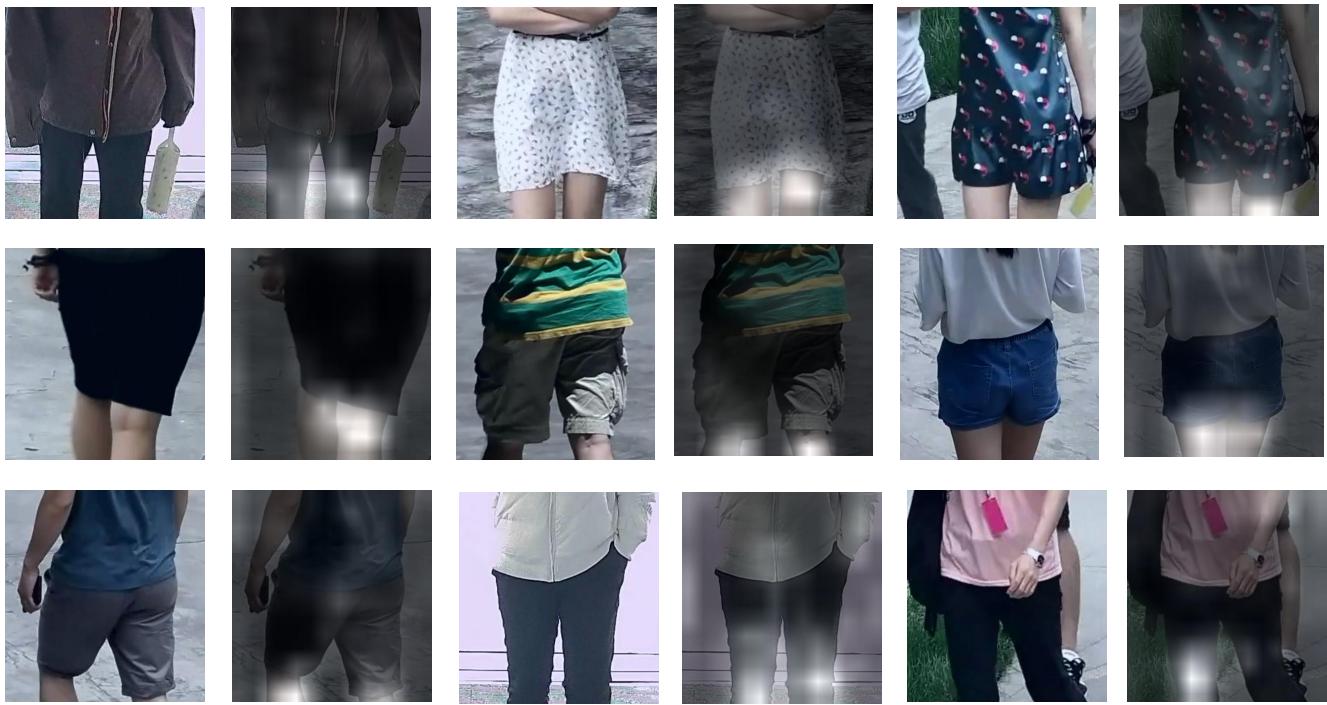


carrying an item or not

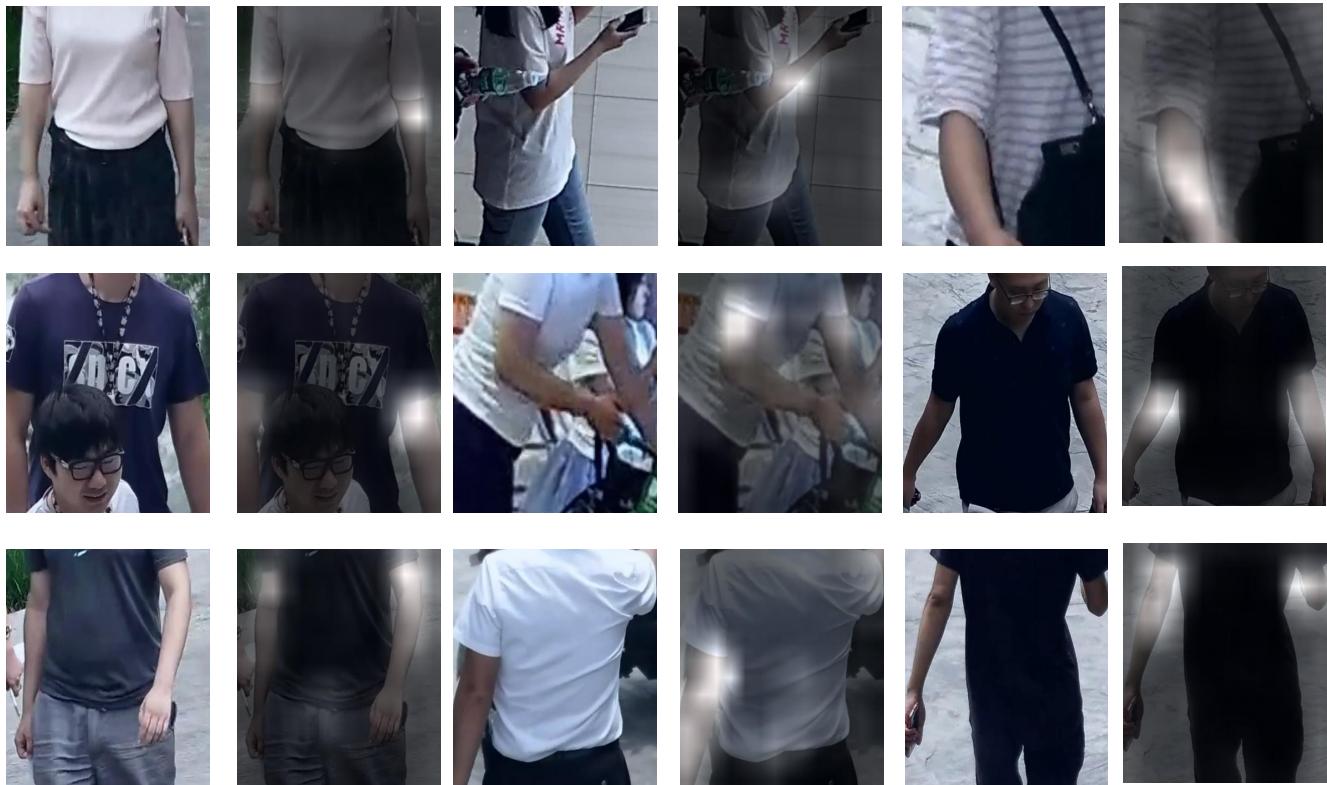


using a cell phone or not

Figure 1. Exemplar images of our human dataset.



length of pants (short/long)



length of sleeve (short/long)

Figure 2. Exemplar images of our human dataset.

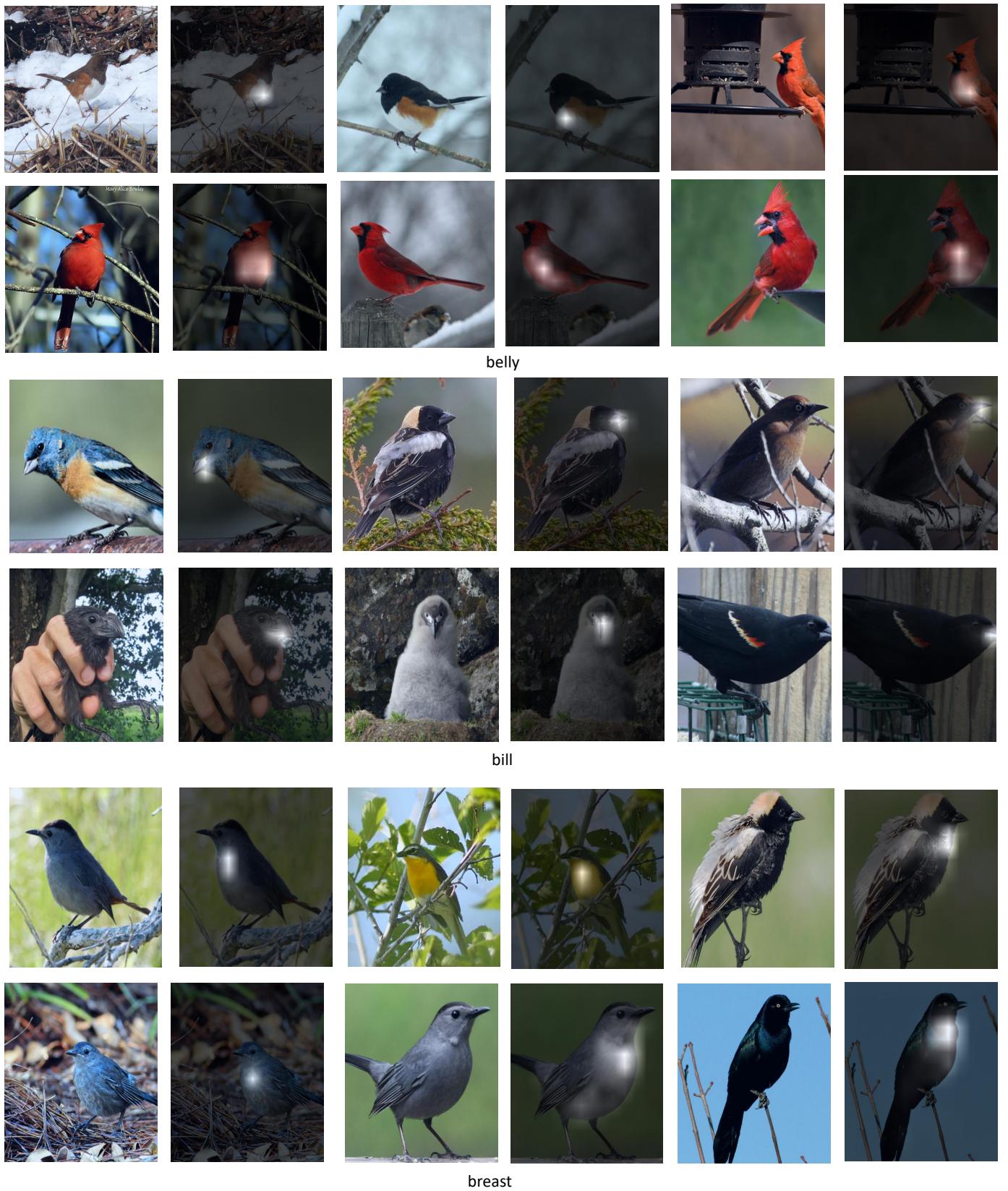


Figure 3. Exemplar images of the CUB bird dataset.



Figure 4. Exemplar images of the CUB bird dataset.