#### How Do You Tell a Blackbird from a Crow: Supplemental Figures

# Thomas Berg and Peter N. Belhumeur Columbia University

{tberg,belhumeur}@cs.columbia.edu

These figures below show a few additional examples of images generated for field guide pages, similar to Figure 4 in the paper. Each part of each figure includes a wheel-and-spokes image that shows the five species most similar to the species in the center, followed by, for one of those top five similar species, the annotated image pairs chosen to illustrate the top three features that distinguish the two species from each other. To allow us to fit three feature-illustrating pairs in each set, we do not show (as Figure 4 of the paper does) a pair of full-body images that do not illustrate a particular feature.

## Species similar to the Vermilion Flycatcher Species similar to the Vermilion Flycatcher (Pyrocephalus rubinus) (Pyrocephalus rubinus) Summer Tanager Summer Tanager Red-headed Scarlet Tanager Red-headed Woodpecker Woodpecker Purple Finch Pine Grosbeak Pine Grosbeak Purple Finch Distinguishing the Vermilion Flycatcher from Distinguishing the Vermilion Flycatcher from the **Summer Tanager** (*Piranga rubra*) the **Scarlet Tanager** (*Piranga olivacea*) The shape of the beak is different in the Vermilion Flycatcher and the Summer Tanager. The color around the eye is different in the Vermilion Flycatcher and the Scarlet Tanager. The pattern around the nape is different in the Vermilion Flycatcher and the Summer Tanager. The color around the back is different in the Vermilion Flycatcher and the Scarlet Tanager.

(a) (b) Figure 1. (a) The vermilion flycatcher and the summer tanager are distinguished by beak shape and the former's dark band through the eye to the nape. (b) The dark band also distinguishes the vermilion flycatcher from the scarlet tanager.

The color around the eye is different in the Vermilion Flycatcher and the

The pattern around the forehead is different in the Vermilion Flycatcher and the Scarlet Tanager.

## Species similar to the Red-winged Blackbird Species similar to the American Redstart (Agelaius phoeniceus) (Setophaga ruticilla) Scott Oriole Shiny Cowbird American Crow Orchard Oriole Mourning Warbler Bay-breasted Warbler Common Raven Brewer's Blackbird Black-throated Blue Warbler Distinguishing the Red-winged Blackbird from Distinguishing the American Redstart from the **Bronzed Cowbird** (*Molothrus aeneus*) the **Scott Oriole** (*Icterus parisorum*) The color around the wing is different in the American Redstart and the Scott Oriole. The color around the eye is different in the Red-winged Blackbird and the The color around the wing is different in the Red-winged Blackbird and the The shape of the beak is different in the American Redstart and the Scott The pattern around the wing is different in the Red-winged Blackbird and the Bronzed Cowbird. The pattern around the back is different in the American Redstart and the Scott Oriole.

Figure 2. (a) The red-winged blackbird and the bronzed cowbird are distinguished by colors on the eye and wing. (b) The American redstart and the Scott Oriole are distinguished by the color of the belly, the shape of the beak, and the shape of the stripe on the wing.

#### Species similar to the **Least Auklet** Species similar to the White-crowned Sparrow (Aethia pusilla) (Zonotrichia leucophrys) Parakeet Auklet Tree Sparrow Whip-poor-will Rinoceros Auklet White-throated Clay-colored Sparrow Sparrow Nighthawk Field Sparrow Harris Sparrow Rusty Blackbird Distinguishing the Least Auklet from Distinguishing the White-crowned Sparrow from the White-throated Sparrow (Zonotrichia albicollis) the Parakeet Auklet (Aethia psittacula) The pattern around the eye is different in the Least Auklet and the Parakeet Auklet. The color around the eye is different in the White-crowned Sparrow and the White-throated Sparrow. The pattern around the nape is different in the Least Auklet and the Parakeet Auklet. The pattern around the eye is different in the White-crowned Sparrow and the White-throated Sparrow.

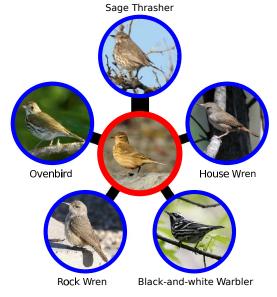
Figure 3. (a) The least auklet and the parakeet auklet are distinguished by the parakeet auklet's whiskers and white throat and the two species respectively white and spotted bellies. (b) The white-crowned sparrow and the white-throated sparrow are distinguished by the latter's yellow mark before the eye and dark patch below the eye.

The color around the throat is different in the White-crowned Sparrow and the White-throated Sparrow.  $\qquad \qquad (b)$ 

The pattern around the throat is different in the Least Auklet and the Parakeet Auklet.

### Species similar to the **American Pipit** (*Anthus rubescens*)

#### Species similar to the **Boat-tailed Grackle** (*Quiscalus major*)





### Distinguishing the American Pipit from the **Sage Thrasher** (*Oreoscoptes montanus*)

Distinguishing the Boat-tailed Grackle from the **Shiny Cowbird** (*Molothrus bonariensis*)









The pattern around the eye is different in the American Pipit and the Sage

The shape of the beak is different in the Boat-tailed Grackle and the Shiny Cowbird.









The pattern around the wing is different in the American Pipit and the Sage Thrasher.

The shape of the tail is different in the Boat-tailed Grackle and the Shiny Cowbird.









The pattern around the back is different in the American Pipit and the Sage Thrasher.

The pattern around the throat is different in the Boat-tailed Grackle and the Shiny Cowbird.  $\qquad \qquad (b)$ 

Figure 4. (a) The American pipit and the sage thrasher are distinguished by the latter's light iris and pronounced speckles on the throat and body. (b) The boat-tailed grackle and the shiny cowbird are distinguished by the former's longer beak, distinctive tail, and more slender body.