

Towards Automated Transcription of Label Text from Pinned Insect Collections



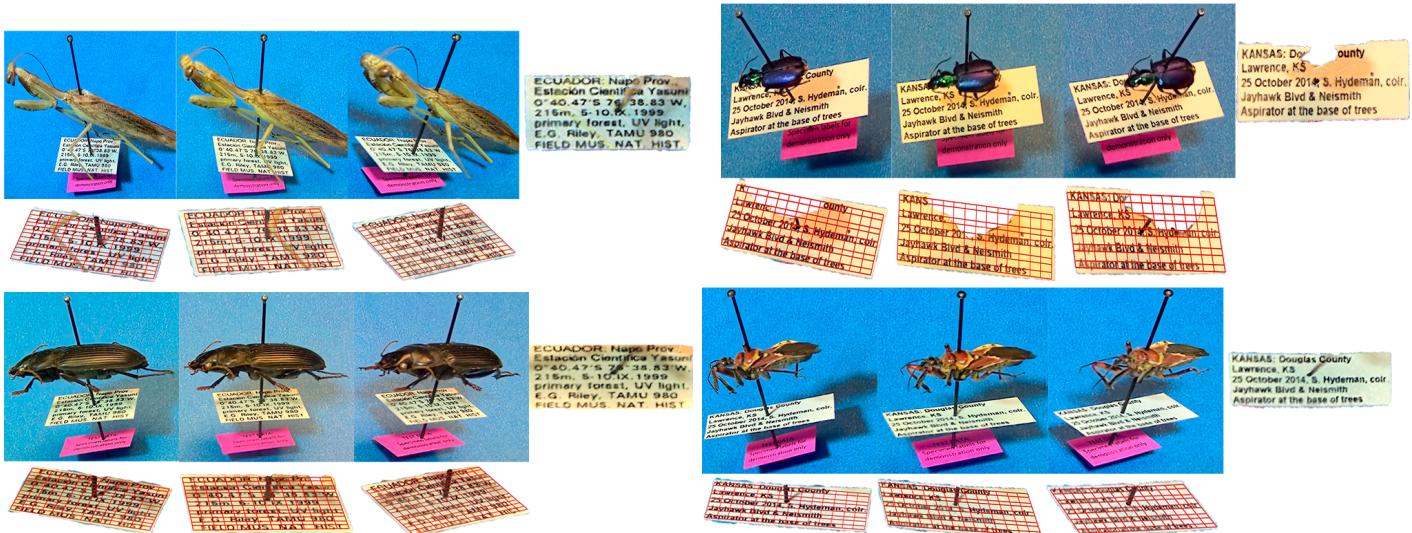
Images of drawers and trays containing actual pinned insect specimens from the Field Museum of Natural History. These images show the diversity in shape and size of the pinned insect and the labels which makes digitization of these insect collections challenging.

In this supplementary document we provide results of our algorithm on a sample of test and real labels (5 test labels and 17 real labels). We also provide qualitative analysis (as mentioned in the paper) on the composite images produced from the test labels before and after non-linear registration. The test labels were generated using text manually transcribed from labels found in our photographic survey of 21 drawers out of the collection. These enable us to compare automatic transcription results with scanned ground truth images. The real labels, including pinned insects, are specimens from the Field Museum of Natural History. For each label in both datasets we acquired 3 light field (LF) images from 3 different views using our camera-rig setup.

For each label dataset below, we show the 3 LF images of the label from the three different views (left-center-right camera location), 2D coordinate grid computed using our method on those labels and a final rectified-composited image (right) of the label. Note the robustness of our algorithm to occlusions (from the pin, label and the pinned insect), shadows of the pins, illumination changes, acute angles necessary to capture these labels due to different shapes and sizes of the pinned insect. During compositing we successfully recover pieces of text which were occluded from view in one of the cameras. Please zoom in to view all the images.

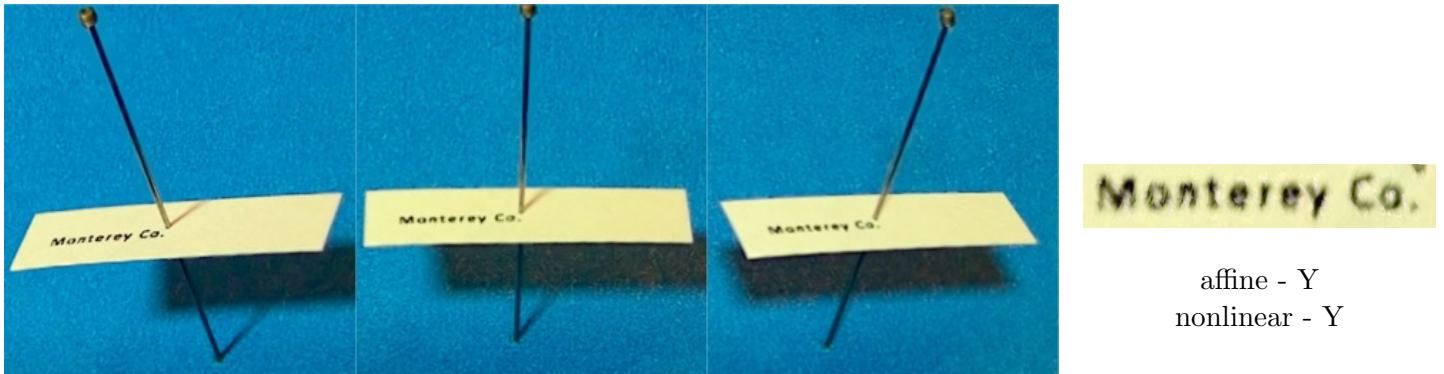
Results on Real Labels



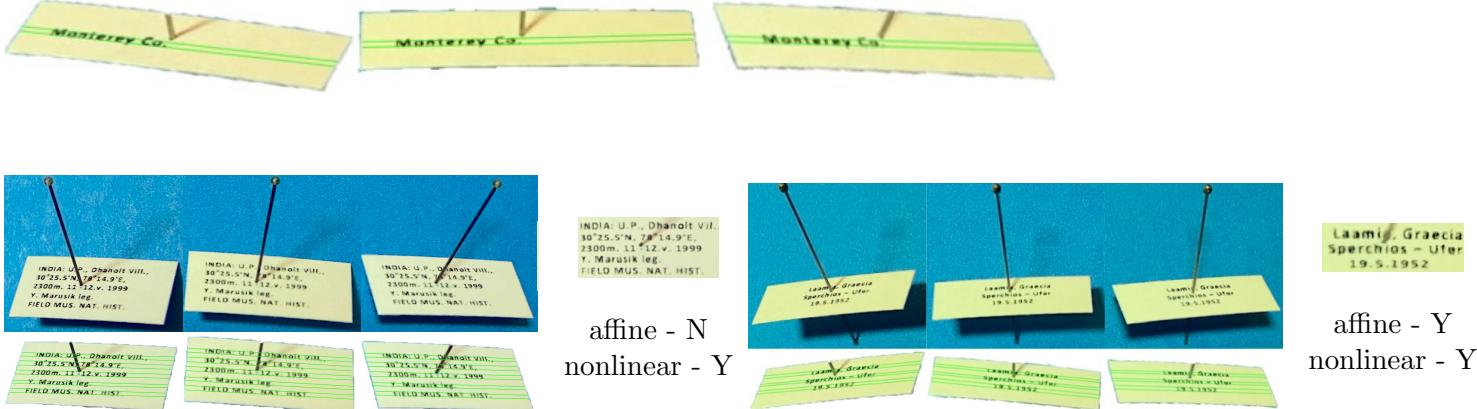


Results on Test Labels with Qualitative Analysis

Below are the results from the test labels along with their qualitative analysis. To perform qualitative analysis, three different individuals visually inspected the composites produced from the test label dataset before and after non-linear registration. Each individual was asked to rate whether the composite was readable (Y), partially readable (M) or not readable (N). If the individual was unsure, they could rate the composite with two ratings. Consensus was drawn from the three individuals by taking their lowest rating for each composite. This is written below the composite for each label dataset. These final consensus rating were also used in Figure 12 and Figure 13 of the paper. (Note, although the text on some composites might be same, those labels were captured from different camera positions and angles making them a different dataset.)



affine - Y
nonlinear - Y



affine - N
nonlinear - Y



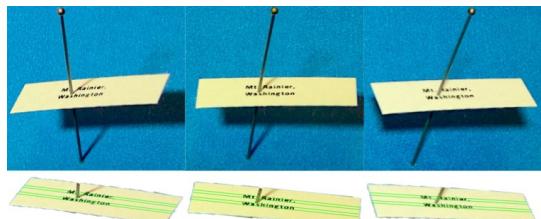
19 July 1948
5000', CALIFORNIA
near SUGAR PINE
AT LIGHT TRAP
Coll. Berth Naina

affine - N
nonlinear - Y



N.Z.E.A., 88-Nelson
Lakes Nat. Park,
Lake Rotofua, 450m
3. & 11. 78. S&Pect
Nothofagus Forest

affine - M
nonlinear - Y



Mt. Rainier,
Washington

affine - Y
nonlinear - Y



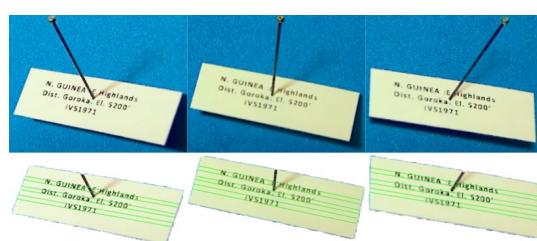
Trachyspissellus
novella Collin
Det. SA Marshall '84

affine - M
nonlinear - Y



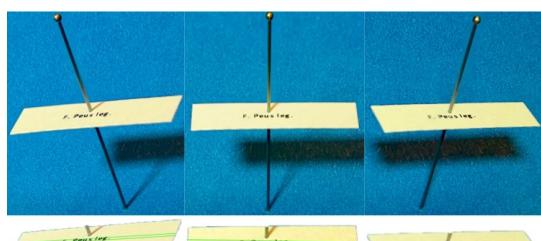
ORE: Grant Co., 5000'
E. of Prairie City
Dixie Park Blk.
1. vi. 1957. Is. Orybas
Ber. garbage & for-
est sublitter

affine - Y
nonlinear - Y



N. GUINEA
Dist. Goroa El. 5200'
IVS1977

affine - Y
nonlinear - Y



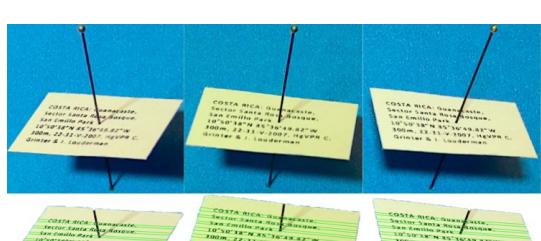
F. Peusi leg.

affine - Y
nonlinear - Y



Laphria
nitidula
Fabricius, 1794

affine - M
nonlinear - Y



COSTA RICA, Guanacaste,
Sector Santa Rosa Reserve,
10°30'N 84°30'W
10°30'N 84°30'W
300m. 22-31.VII.1973
Günther & J. Louderman

affine - N
nonlinear - Y



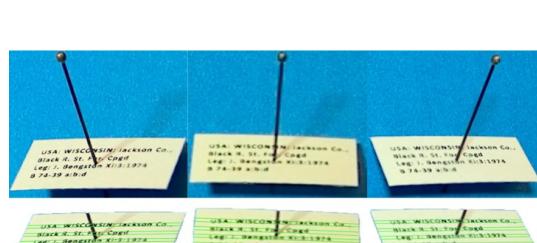
MEX: Oaxaca, 2.2mi Eject
Max. 1750m elev. 900'
9-19. VIII. 1973 Oak
pine, Dung A. Newton

affine - N
nonlinear - Y



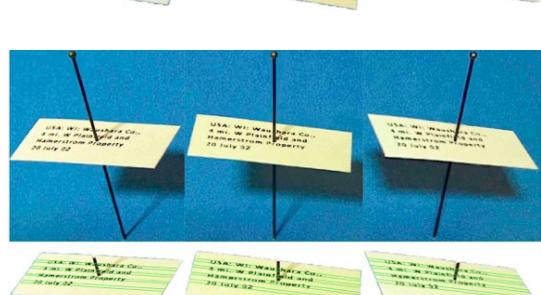
Laphria
nitidula
FABRICIUS, 1794

affine - Y
nonlinear - Y



USA: WISCONSIN Jackson Co.,
Black M. St. 100' Crust
Leg. 1. Bengtson XII-3-1974
8-7-89 x-0-0

affine - M
nonlinear - Y



INDIA: U.P. Deoria VIII.
2300m. 11.4.24.1968
Y. Marwari leg.
FIELD MUS. NAT. HIST.

affine - N
nonlinear - M



INDIA: U.P. Deoria VIII.
2300m. 11.4.24.1968
Y. Marwari leg.
FIELD MUS. NAT. HIST.

affine - N
nonlinear - N