Getting More From Image Libraries – New Computer Vision Tools

John La Salle
Specimens images from Australia's Natural History collections

Images from Australian Natural History collections made available by the museums and herbaria of Australia. To view images from all collections, click here.

South Australian Museum Terrestrial Invertebrate Collection
South Australian Museum

The collection has Australia-wide and Indo-Pacific representation, plus some world specimens for comparative purposes.

Australian National Insect Collection
Commonwealth Scientific and Industrial Research Organisation

The Australian National Insect Collection is recognized both nationally and internationally as a major research collection.

Museum Victoria Ornithology Collection
Museum Victoria

Malurus (M) amabilis clarus
Holotype
HLW 2584

The Ornithology Collection contains more than 70,000 specimens of mounted birds, skins, skeletons, eggs and specimens preserved in alcohol. One of the largest Australian avian collections, primarily of Australian species and with a strong Victorian emphasis, it includes material from a broad spectrum of the world's avifauna and represents in excess of 4,000 species.

Australian Museum Entomology Collection
Australian Museum

Museum Victoria Entomology Collection
Museum Victoria

Australian Museum Marine Invertebrate Collection
Australian Museum
Images of 25 species from family: **TEPHRITIDAE**
LIBELLULIDAE

Common Skimmers

Specimen Images

- Brachyopla cincta
  Commonwealth Scientific and Industrial Research Organisation
- Trapezostigma stenolabata
  Commonwealth Scientific and Industrial Research Organisation
- Trapezostigma euryolia
  Commonwealth Scientific and Industrial Research Organisation
- Trapezostigma stenolabata
  Commonwealth Scientific and Industrial Research Organisation
- Trapezostigma virginia
  Commonwealth Scientific and Industrial Research Organisation
- Trapezostigma aquilia
  Commonwealth Scientific and Industrial Research Organisation
- Trapezostigma liberata
  Commonwealth Scientific and Industrial Research Organisation
- Trapezostigma basilaris
  Commonwealth Scientific and Industrial Research Organisation
- Trapezostigma lacerata
  Commonwealth Scientific and Industrial Research Organisation
- Trapezostigma transmarina
  Commonwealth Scientific and Industrial Research Organisation
- Trapezostigma lamarckii
  Commonwealth Scientific and Industrial Research Organisation
- Trapezostigma roseengi
  Commonwealth Scientific and Industrial Research Organisation
- Trapezostigma euryoele
  Commonwealth Scientific and Industrial Research Organisation
Ludwig Leichhardt
23 October 1813 – c.1848
Prussian explorer and naturalist
Most famous for his exploration of northern and central Australia.
Gathering phenomic information

Extracting information from image libraries

1. No use having information libraries if you don’t extract rich information from them ...  
2. ... in a fashion that gives you the ability to store, manage, discover, **share and re-use** information associated with the images  
3. Character matrix / trait bank (specimen and species level)
Demo of true-color 3D insect models

3D models provided by Chuong Nguyen of CSIRO Computational Informatics. The specimens were mostly from Chuong Nguyen, David Lovell, Matt Adcock and John La Salle (2013) Capture natural-colour 3D models of insects.

This YouTube video describes the 3D insect scanning systems that created these 3D models.

This work is supported by CSIRO Computational Informatics, CSIRO Ecosystem Sciences, Atlas of Living Australia.

Licence: 3D models are released under Creative Commons Attribution Licence.

Rights statement: All Rights (including copyright) CSIRO Australia 2013.

Contact: Chuong Nguyen of CSIRO Computational Informatics.

Note: 3D models were tested with Firefox 25.0 and Chrome 31.0. Last update on 19 December 2013.
<table>
<thead>
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Need an order of magnitude increase in how we capture information from image libraries

1. Working with CSIRO computer vision team*
2. Current “best practice” in image based phenomics is automated identification ...
3. ... which does not give you the ability to store, manage, discover, share and re-use information associated with the images

*Changming Sun, Chuong Nguyen, Matt Adcock, Stuart Anderson
Accelerating biodiversity discovery and documentation
Creating a “trait bank”
Creating a “trait bank”
Accelerating biodiversity discovery and documentation

Image Details
Name: test-large 9008x5067.jpg
Size (KB): 4918.84
Type: image/jpeg
Width (Pixels): 9008
Height (Pixels): 5067

Image Actions
- Analyse
- Zoom To Fill
- Delete

Analysis Results
No analysis performed
Junction Detection
Linear Feature Enhancement
Object Boundary Information

- Curvatures
- Concave points
- String cuts
- Inner distances
Accelerating biodiversity discovery and documentation.

Image Details
- Name: test-large 9008x5067.jpg
- Size (KB): 4918.84
- Type: image/jpeg
- Width (Pixels): 9008
- Height (Pixels): 5067

Analysis Results
- Pterostigma: [6591,1263]
- Nodus Point: [4706,1148]
- Anti-Nodal Cross Veins: 17
- Post-Nodal Cross Veins: 12
- Wing Similarity: 0.760291
- Forewing Length: 5366.83
Accelerating biodiversity discovery and documentation

Analysis Results

**Pterostigma:** [6591,1263]

**Nodus Point:** [4706,1146]

**Anti-Nodal Cross Veins:** 17

**Post-Nodal Cross Veins:** 12

**Wing Similarity:** 0.760291

**Forewing Length:** 5365.83
Accelerating biodiversity discovery and documentation

Synlestes weyersii F.jpg

Image Details
Name: Synlestes weyersii F.jpg
Size (KB): 3048.86
Type: image/jpeg
Width (Pixels): 9008
Height (Pixels): 6067

Image Actions
- Analyse
- Zoom To Fit
- Export Character Matrix
- Delete

Analysis Results
Pterostigma: [5694,1726]
Nodus Point: [3285,1592]
Anti-Nodal Cross Veins: 2
Post-Nodal Cross Veins: 19
Wing Similarity: 0.993792
Forewing Length: 3969.73

For online access to Australia's biodiversity information www.ala.org.au
Accelerating biodiversity discovery and documentation

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Virtual expedition of the day

AUSTRALIAN MUSEUM MALACOLOGY COLLECTION

Australian Museum Bivalve Expedition - 18

Start transcribing A

More expeditions

6%

Australian Museum Bivalve Expedition - 18

63%

Sceplomyza (Diptera;Drosophilidae) of Hawai‘i II

69%

South Africa - Acocks Collecting Register Book 5

76%

South Australian Museum Brittle Star Expedition

80%

Australian National Insect Collections - Boes

93%

The Three Hearts of Belgium

Honour Board

Day Tripper  View Top 20

Ema van Zyl  115

Weekly Wonder  View Top 20

Teresa Van Der Heul  980

Monthly Maestro  View Top 20

Teresa Van Der Heul  980

DigVol Legend  View Top 20

Megan Edey  56798

View my notebook

Expedition stats

263053 tasks of 287959 completed
1412 volunteer transcribers.

News

29 Oct 2015

WeDigBio
Welcome to the Australian Museum Tag a Fish-3

Australian Museum Tag a Fish-3 overview

We are really excited about this project! Nearly 5000 species of fishes are known from Australian waters. Please help us tag the major characteristics of the fishes shown in these images. By doing so, you will be recording baseline data, which will be fed into a new fish identification website for Australia. Please join us on this exciting digital expedition.

Australian Museum Tag a Fish-3 personnel

Expedition Leader
1. Erne van Zyl (308)

Scientists
1. Reiner Richter (306)
2. Karl Moy (191)
3. Hue Ng (58)
4. Vivien Zajicek (52)

Collection Managers
1. Wayne Murray (20)
2. Rachel Lee (19)
3. Bonnie M (13)
4. Ava Tonin (12)

Technical Officers
1. Lillie McDonagh (5)
2. Sophie Woods (4)
3. Paul Flamons (3)
4. Clare Callinan (3)
5. Eloise O'Connor (1)
6. Dion Russell (1)
Pattern- choose as many as you like.

- Bands (vertical)
- Stripes
- Spot(s)
- Blotches
- No pattern
- Eye spot
- Other pattern
Tail Shape

- Pointed
- Rounded
- Truncate
- Emarginate
- Forked
- Lunate
- Heterocercal
For online access to Australia’s biodiversity information

DigiVol » Australian Museum Ichthyology Collection » Australian Museum Tag a Fish 4 » Transcribe Task c4063cc7-7a34-4fd-625b-a75fa9b1a708.jpg

Other

Please add any other tags that you feel describe this fish. Separate words with a comma. Add as many as you like.
## Volunteer for a virtual expedition

Seven expeditions need your help. Join now!

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<tr>
<th>Name</th>
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<th>Volunteers</th>
<th>Sponsoring Institution</th>
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</table>
It is amazing what you can accomplish if you do not care who gets the credit

Harry S. Truman

www.ala.org.au