

# Applied Edge Detection in Zoological Collections

## Inselect Prototype

**Laurence Livermore**

Vladimir Blagoderov, Alice Heaton, Pieter Holtzhausen  
Lawrence Hudson, Ben Price and Stéfan van der Walt

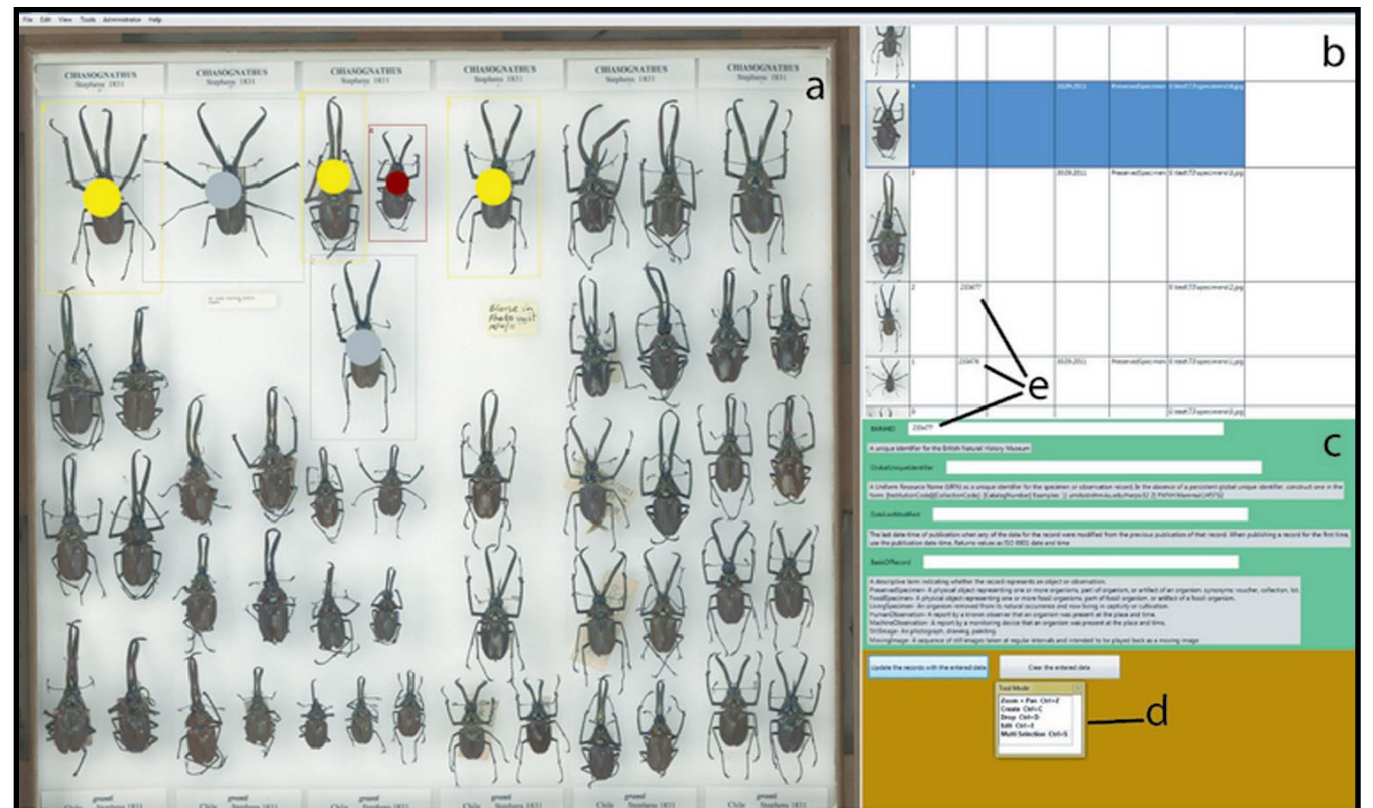
SYNTHEsys3 AGM – JRA Highlights



**Mantle et al (2012)** Whole-drawer imaging for digital management and curation of a large entomological collection. *ZooKeys* 209: 147–163, doi: [10.3897/zookeys.209.3169](https://doi.org/10.3897/zookeys.209.3169)

# Current supporting software

- **Annotation and processing a limited step**
- **Current software:**
  - **Not automated**
  - **Poor UX/UI**
  - **Closed source and proprietary**
  - **Not cross-platform (Windows only)**



# Creating an open source prototype

- **Collaboration between NHM and Stellenbosch University, South Africa**
- **Initial collaborators: Stéfan van der Walt, Pieter Holtzhausen, Ben Price, Vladimir Blagoderov and Laurence Livermore**
- **Prototype:**
  - **Open source**
  - **Python-based (OpenCV, scikit-image)**
  - **Downscale high resolution images for processing**
  - **Automatically detects specimens**
  - **Creates bounding boxes for cropping**
  - **Can batch process images and save coordinates**

Image Viewer

File View Help



Open Image Segment Zoom In Zoom Out Export Images

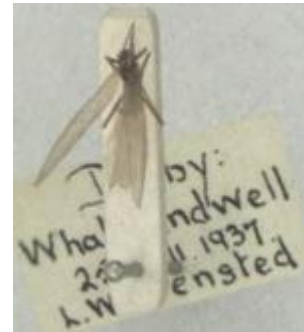


Image Viewer

File View Help

Open Image Segment Zoom In Zoom Out Export Images





## Extending prototype – September hackathon

- **Extend team with in-house hackathon (Sept 1<sup>st</sup>-12<sup>th</sup>)**
- **Project and code is online (GitHub)**
- **Cross platform installers (Windows, OSX, Linux)**
- **Code restructuring and unit testing (improved sustainability, less bugs)**
- **Annotation and reviewing interface**
- **Object hierarchy and grouping (unit trays etc.)**
- **Improving algorithms, testing against varied drawers**



## Potential Future development

- **Investigate potential for applied machine learning (based on user corrections)**
- **More configurable settings**
- **Barcode reading (slides)**
- **Herbarium sheet label detection**
- **Collaboration/code development with other partners (iDigBio)**

First public alpha release of Inselect:

**September 2014**

Contact [l.livermore@nhm.ac.uk](mailto:l.livermore@nhm.ac.uk) for details

# Acknowledgements

## **Development team:**

Alice Heaton<sup>1</sup>, Pieter Holtzhausen<sup>2</sup>, Lawrence Hudson<sup>1</sup> and Stéfan van der Walt<sup>2</sup>

## **Planning and testing:**

Vladimir Blagoderov<sup>1</sup>, Ben Price<sup>1</sup> and Laurence Livermore<sup>1</sup>

1. NHM, London, UK; 2. Stellenbosch University, South Africa;