



invertnet



InvertNet: 2013-14 Progress and Goals

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Rationale

- vast majority of specimens in U.S. collections are invertebrates
 - primarily insects and related arthropods
 - less than 5% available online
 - only label data usually provided
- most invertebrate biodiversity research is specimen-based
 - all knowledge of many species is embodied in collections
- existing digitization methods are inadequate
 - slow and expensive (\$1+ per specimen)
 - risk of damage to specimens from handling



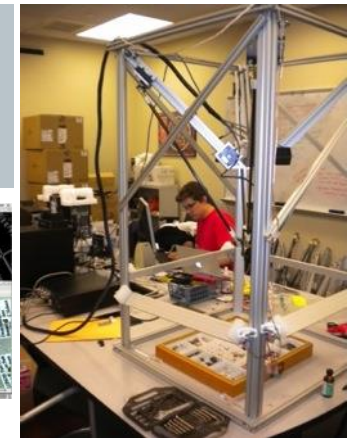
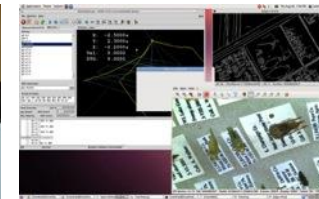
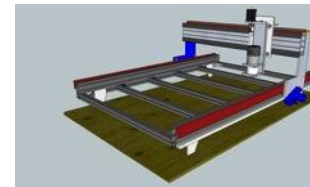
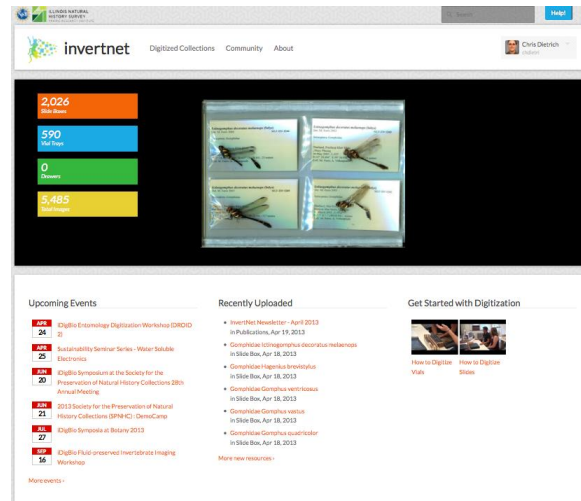
Goals

- Digitize all holdings of 22 midwestern arthropod collections (~50 million specimens)
 - Specimen images and metadata (label info)
 - Drawers, vials, slides
 - Advanced imaging (including 3D)
 - Best quality at reasonable cost (~\$0.10/specimen)
- Provide access to images and other data via online virtual museum
 - browsable/searchable/zoomable web interface
 - link to other data providers (GBIF, iDigBio etc.)
- Provide platform for research and development of additional tools and resources
 - Data mining and analysis
 - Community building, collaboration, and support
 - Education, outreach, and reference



Accomplishments

- Created InvertNet cyberinfrastructure platform based on HUBzero (invertnet.org)
- Implemented efficient workflows for slides and vials using 2D scanning technology
- Built and tested several prototype whole-drawer digitization systems
- Built 13 robotic drawer digitization systems for collaborators (deliveries underway)
- Built 180 TB storage system to house InvertNet image library
- Ingested 17,000+ images and metadata from collaborating institutions representing >300,000 specimens
- Developed image annotation tool to facilitate specimen-level data capture
- Linked InvertNet data repository to iDigBio portal and BugGuide.net
- Held two training workshops for collaborators (April 2012 and November 2013)
- Participated in numerous workshops, symposia and planning meetings
- Published 2 papers describing our high-throughput digitization approach
- Trained 15 grad students and >30 undergrads



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RESEARCH ARTICLE

InvertNet: a new paradigm for digital access to invertebrate collections

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Balle et al. *Frontiers in Zoology* 2013, 10:55
<http://www.frontiersinzoology.com/content/10/1/55>



COMMENTARY Open Access

Biodiversity into your hands - A call for a virtual global natural history 'metacollection'

Michael Balle^{1*}, Stefan Schmidt², Axel Hausmann³, Emmanuel FA Toussaint⁴, Johannes Bergsten⁵, Matthew Bullington⁶, Christoph L. Hülse⁷, Alexander Kroupa⁸, Georg Hagedorn⁹, Alexander Reich⁶, Andrew Polaszak¹⁰, Roschon Libardillo¹¹, Lars Koogmann⁷, Andreas Zwicq⁶, Martin Fälsch¹⁰, Jiri Hájek¹⁰, Mariano C Michal¹², Christopher Dietrich¹³, John La Salle¹⁴, Beth Marston¹⁵, Peter Kl Ng¹⁶ and Donald Hoborn^{17*}

Year 4 Goals

- Finish delivering drawer digitization systems, train users
- Capture images of ~80,000 drawers from all collaborating institutions and provide access via InvertNet.org
- Crowdsource label data capture from images of slides, vials and drawers
- Ingest existing specimen-level data from collaborating institutions
- Improve 3D reconstruction tools to allow virtual tilting of drawer and specimen images via a web interface



Sign In Illinois Natural History Survey: Insect Collection

ILLINOIS NATURAL HISTORY SURVEY
INTEGRATED DIGITIZED BIOCOLLECTIONS

Search INHS Insect database
(also incl. Arachnida, Myriapoda, Onychophora, & Xiphosurida)

Search Term: Where: Partial Search: Sort:

And

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Results per page: | [Add a line](#) | [Clear the form](#) |

Found records: 125 (Page: 1 of 5)

Catalog Number	Class	Order	Suborder	Superfamily	Family	Subfamily	Tribe	Genus	Subgenus	Species	Subs
Homoptera 27772	Insecta	Homoptera	Auchenorrhyncha	Membracidae	Cicadellidae	Deltocephalinae	Panillimini	Morgolajassus		Stanshaica	
Homoptera 27773	Insecta	Homoptera	Auchenorrhyncha	Membracidae	Cicadellidae	Deltocephalinae	Panillimini	Morgolajassus		Stanshaica	
Homoptera 27774	Insecta	Homoptera	Auchenorrhyncha	Membracidae	Cicadellidae	Deltocephalinae	Panillimini	Morgolajassus		Stanshaica	
Homoptera 27775	Insecta	Homoptera	Auchenorrhyncha	Membracidae	Cicadellidae	Deltocephalinae	Panillimini	Morgolajassus		Stanshaica	
Homoptera 27776	Insecta	Homoptera	Auchenorrhyncha	Membracidae	Cicadellidae	Deltocephalinae	Panillimini	Morgolajassus		Stanshaica	
Homoptera 27777	Insecta	Homoptera	Auchenorrhyncha	Membracidae	Cicadellidae	Deltocephalinae	Panillimini	Morgolajassus		Stanshaica	
Homoptera 27832	Insecta	Homoptera	Auchenorrhyncha	Membracidae	Cicadellidae	Deltocephalinae	Panillimini	Morgolajassus		Stanshaica	



ILLINOIS NATURAL HISTORY SURVEY

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Hymenoptera Neodiprion 1739
By Joe Leigh
University of Illinois at Urbana-Champaign

About [Image 1](#) [Image 2](#) [Image 3](#) [Image 4](#) [Image 5](#) [Bug Guide](#)

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