

E.2 Invitation letter to participants

Understanding how People Work with Parts of Images in Scholarly Tasks

Invitation letter to recruit participants

We are looking for participants in a study on “Understanding how People Work with Parts of Images in Scholarly Tasks”. Specifically, we would like to examine how parts of images and associated information are managed, retrieved, and used in fish species identification. Also, we want to get feedback on the use of SuperIDR in fish species identification. We have developed SuperIDR, an image-based digital library that allows users to mark parts of images and annotate those parts. Later, users may retrieve information through browsing and through searching by text- and content-based image retrieval.

Our goals in this study are: 1) to get a deeper understanding how people work with parts of images and associated information in scholarly tasks, such as fish species identification; and 2) to get detailed feedback on people’s use of SuperIDR in fish species identification. We hope that the results of this study might be used to develop robust and usable digital libraries (and other software tools) that enable people to work with parts of images to support scholarly tasks, such as fish species identification.

The study will consist of: 1) pre-study interview (30 minutes); 2) install/setup SuperIDR and training phase (1 hour), 3) diary study on the use of SuperIDR (3 weeks); 4) follow-up interview (1-2 hours). The diary study will involve using SuperIDR and reporting every use through a 30-second audio message or a half-page write-up. We are looking for people who have good knowledge of and who frequently engage in fish species identification to participate in this study (preferably those who have taken a course in Ichthyology). Each active participant will be compensated \$50 upon completion of this study.

Please let us know if you are interested in participating in this study and/or if you would like to discuss the details of this project. Please forward this invitation to others who might be interested.

Thank you for your consideration. We look forward to hearing from you.

Sincerely,

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E.4 Training tasks

For the initial session in the study, we were guided by the following tasks to train participants in using the various functions of SuperIDR.

1. Use species browsing by taxonomy to locate a known species
2. Use species browsing by key to locate a known species.
3. Browse images of a known species.
4. Add image to image collection of a known species.
5. Delete image from image collection of a known species.
6. Browse annotations of an image of a known species.
7. Add annotations to an image of a known species.
8. Delete annotation from annotation list of an image of a known species.
9. Modify annotation from annotation list of an image of a known species.
10. Given an unknown specimen, use search by text to identify the species of the specimen (using textual keywords that describe the species).
11. Given an unknown specimen image, use image search on whole image to identify the species.
12. Given an unknown specimen image, use image search on part of an image to identify the species.
13. Given an unknown specimen (and image), use combined search (text in species descriptions + whole images) to identify the species.
14. Given an unknown specimen (and image), use combined search (text in annotations + part of image) to identify the species.
15. Use the comparison feature to compare and make annotations on two images of the same species.

E.5 Species list

We handed a list of species to participants at the beginning of the qualitative user study. We mentioned to them that the unknown specimen identification would be chosen from the said list. The objective of providing the list was to encourage participants to use the annotation and image management functions of SuperIDR. The list of species is as follows:

Bluespotted sunfish (*Enneacanthus gloriosus*)
 Blackbanded sunfish (*Enneacanthus chaetodon*)
 Banded sunfish (*Enneacanthus obesus*)
 Longnose dace (*Rhinichthys cataractae*)
 Flat bullhead (*Ameiurus platycephalus*)
 White catfish (*Ameiurus catus*)
 Snail bullhead (*Ameiurus brunneus*)
 Yellow bullhead (*Ameiurus natalis*)
 Brown bullhead (*Ameiurus nebulosis*)
 Black bulhead (*Ameiurus melas*)
 River redhorse (*Moxostoma carinautum*)
 Black redhorse (*Moxostoma duchesnei*)
 Silver redhorse (*Moxostoma anisurum*)
 Greenside darter (*Ethesotoma blennioides*)
 Candy darter (*Ethesotoma osburni*)
 Kanawha darter (*Ethesotoma kanawhae*)
 Banded darter (*Ethesotoma zonale*)
 Mountain redbelly dace (*Phoxinus oreas*)

Tennessee dace (*Phoxinus tennesseensis*)
Golden redhorse (*Moxostoma erythrurum*)
Roanoke hogsucker (*Hypentelium roanokense*)
Northern hogsucker (*Hypentelium nigricans*)
Rosyside dace (*Clinostomus funduloides*)
Blacknose dace (*Rhinichthys atratulus*)
Longnose dace (*Rhinichthys cataractae*)
Spotted bass (*Micropterus punctulatus*)
Largemouth bass (*Micropterus salmoides*)
Smallmouth bass (*Micropterus dolomieu*)
Blackside darter (*Percina maculata*)
Shield darter (*Percina peltata*)
Stripeback darter (*Percina peltata*)
Appalachia darter (*Percina gymnocephala*)
Swannanoa darter (*Etheostoma swannanoa*)
Ashy darter (*Etheostoma cinereum*)
Variegate darter (*Etheostoma variatum*)
Satinfin shiner (*Cyprinella analostana*)
Whitetail shiner (*Cyprinella galactura*)
Stelcolor shiner (*Cyprinella whipplei*)

E.6 Pre-study interview guiding questions

Understanding how People Work with Use of Parts of Images in Scholarly Tasks

Pre-Study Interview Guiding Questions

Section 1: Background/demographic information

Goal: To get the background and demographic information of the participant

1. Participant Number: _____
2. Name: _____
3. Gender: M/F
4. Age:
 - 18-22
 - 23-29
 - 30-39
 - 40-49
 - 50-59
 - 60-65
 - 66 or over
5. Highest education degree/level:
UG / Master's / Doctorate / Certificate / Other _____
Name of degree: _____
Major: _____
6. Occupation:
 - Student (major: _____)
 - Researcher
 - Teacher
 - Teaching Assistant
 - Research Assistant
 - Practitioner (mention role) _____
 - Other _____
7. What department are you in? What is your job expertise, specialty?
8. What is the nature of your work/study (area of interest, role, major, classes taught/assisted, research projects, etc.):

Section 2: Species identification in work/study

Goal: To examine the participant's familiarity/understanding of species identification and their approach/materials used in this task.

9. How frequently do you do fish species identification in your work? In what context?
10. Where do you do fish species identification (lab, classroom, field, etc.)?
11. How much experience do you have in species identification (years of experience identifying species, number of times identifying species)?
 - None
 - Few weeks (such as, auditing a course)
 - One semester (such as, taking a course)
 - 1-3 years (such as, taking/assisting/teaching a few classes)
 - More than 3 years (species identification is a key part of my work/study)
12. How would you rate your familiarity with freshwater fish species of Virginia?
 - Unfamiliar
 - I know very few of those species
 - Have worked with some species (in the class, lab, field)
 - Have worked with many species
 - I have expert knowledge of this region
13. What are the important activities in fish species identification (preparation, note-taking, analyzing, annotating, marking images, etc.)?
14. What is your current approach in fish species identification?
15. Talk about your use of images (line drawings, pictures, etc.) in species identification.
16. What data do you use for fish species identification (notes, key, images, website information, etc.)?

Section 3: Computer and software knowledge

Goal: To learn about the participant's familiarity and use of a computer in the work/study life

17. Do you own a computer? Which one? Please provide specifications (model, OS, RAM, etc.)
18. How often do you use computers in your work/study?
 - I don't use a computer for my work
 - Very little use (only email and the internet)
 - Basic software (word processing, spreadsheet, presentations, etc.)

- I use advanced software tools to organize and work with my information (such as software for statistical analysis, photo management, notes management, etc.)
- I do everything on the computer

19. Please list the software that you use.
20. Please list any software that you use in species identification, including web browsers, word processing, presentation, photo software, etc.
21. Please describe some of your other work activities that you do on the computer related to your work/study.

E.7 Post-study interview guiding questions

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Post-Study Interview Guiding Questions

We will refer to pre-study interview response, logs, diary entries, and other materials collected, where required. We will ask for examples where possible.

Section 1: Motivation for using parts of images in fish species identification

Goal: To understand why people use parts of images in scholarly tasks.

1. Where do you use parts of images in your species identification approach? What types of tasks? Examples?
2. Why?
3. What value does using it bring to your species identification approach? Examples?

Section 2: Parts of images and associated information as information objects

Goal: To understand what constitutes part of an image and associated information in scholarly tasks and the forms they might take.

4. What parts of images do you mark-up? Examples?
5. What other (types of) content do you associate/link with these parts (in notes, textbooks, website information, etc.)? Where might content be located? Examples?
6. What forms might these parts of images (style, symbols, pointers, etc.) and associated information (page numbers, cues, etc.) take? Is there a standard format or controlled vocabulary?
7. What roles does the associated information play in relation with marked-up regions (to understand the relationship between marked-up regions and associated information)? Examples?

Section 3: Use of parts of images and associated information in scholarly tasks

Goal: To understand how parts of images and associated information are used in scholarly tasks and what people do with this information in scholarly tasks.

8. How do you use parts of images in fish species identification? How do you use associated information? (Walk us through the process, giving examples?)
9. How do you create these parts of images?
10. What specific activities do you use them for? Examples?
11. Do you associate text annotations with parts of images? Please walk us through a typical annotation process.
12. How do you manage (create, modify, delete, organize) and retrieve (browse and search) this information in various activities [refer to pre-study response as well] of fish species identification? Examples?
13. Do you work with the part of the image separately from the image itself? How important is it for you to retain this context and to be able to view in this context? If you refer back and forth, please describe how you do it. Examples?

Section 4: Use of SuperIDR in scholarly tasks

Goal: To understand how people use SuperIDR in scholarly tasks and how it supports their use of parts of images in scholarly tasks.

14. How did you feel about using SuperIDR for fish species identification? Were you able to accomplish species identification with SuperIDR? Examples?
15. How did it support your use of parts of images in your approach to species identification? Examples?
16. Did it change anything in your approach to species identification? What? Examples?
17. Which features were useful/important? Examples?
18. Which were not useful/not that important? Examples?
19. What was easy to use? Examples?
20. What was difficult to use? Examples?
21. How could SuperIDR better support species identification?
22. What other features would you like to see in SuperIDR, relating to working with parts of images (create, manage, search, browse, annotate, compare, etc.)?

23. How do you feel about using the tool to identify preserved specimens versus use of the tool to identify images of preserved specimens?
24. What was the impact of the type of specimen (preserved or image) in the outcome of the task?

25. Do you see yourself using it in the future? Examples?
26. Who/Where else do you see using this tool? Examples?
27. How would you describe this tool to others?
28. Did knowing the set of species help with the tasks?