Understandable Microtasks With No Visual Representation

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Abstract

Microtasks expand ways for people to work, which we could not imagine in the past. When people have pockets of time, they can perform microtasks. We pursue this approach further by exploring the design of microtasks that interact with workers with audio and physical means only, without any visual representation. Such a task can be performed in situations where workers cannot use display devices. This demo shows that consistency in navigation is an important factor for better design of such a task, by letting the audience compare tasks designed according to different principles.

Introduction

Crowdsourcing has provided a way to solve problems that could not be solved before; however, has been extending ways people to work. One of the key concepts used in a particular type of crowdsourcing is microtasks; they can be performed in a short period of time, without requesting the workers to communicate with the requester to obtain further information than the task instruction.

An interesting effect of microtasks is that they allow people to work in situations that they would not work before. For example, when they are free for five minutes, they can perform microtasks. In typical microtasks, both of the task instruction and the result entry form are provided on some visual representation on the screen, and workers type the task result in the entry form.

This paper explores a different modality of microtasks trying to broaden the situations in which people can work, by addressing the design of microtasks without any visual representations. We assume that the task instruction and any data related to the task are given in *an audio matrix* (Figure 1); an audio matrix is an N-dimensional space with coordinates, where an audio clip can exist at each location. Given an audio matrix task (AM task [1]) derived from voice guidance (Corkrey and Parkinson 2002), the worker can navigate in the matrix in some physical ways, such as by pressing arrow keys, hear the audio matrix at each location, and submit the task result. Such an interface allows people to perform tasks a situation they do not want to see a display, such as in the bed or sitting on the beach.

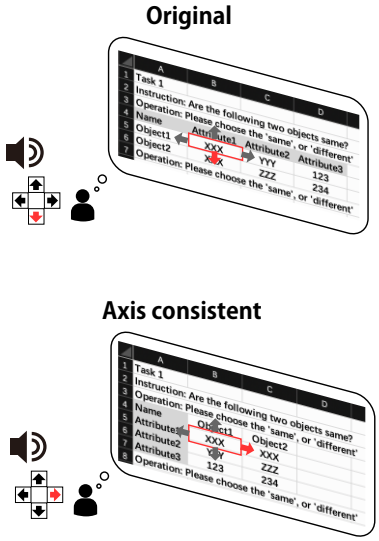

Figure 1: Audio Matrix: (Top) Original scheme (Bottom) Axis consistent. In the axis consistent when the worker presses the same key, such as the right arrow key on the keyboard, the task will be easier to understand if it *always* means to compare the values of the same attribute of different objects. In contrast, in the original scheme the worker needs to press the down arrow key not only to compare the values but also to read the task instruction as well.

This paper focuses on a particular class of microtasks, namely object comparison tasks, because the proposed method assumes that the tasks are associated with tabular data and object comparison tasks often requires them. Object comparison is a fundamental component of entity matching which plays a key role in many problems such as information integration, natural language understanding and semantic web (Shen, Li, and Doan 2005). Tasks that use such operations have a comparison of whether the two entities are the same or choosing one entity based on instructions. The object comparison task is critical in data cleaning and inte-

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[1]AM Task Demo Video: https://bit.ly/2XrJnQf

	Name	City	Age
t_1	Dave Smith	New York	18
t_2	David Smith	New York	18

(a) structured

	Description
t_1	Kingston 133x high-speed 4GB compact flash card ts4gcf133, 21.5 MB per sec data transfer rate, dual-channel support, multi-platform compatibility.
t_2	Kingston ts4gcf133 4GB compactflash memory card (133x).

(b) textual

	Name	Brand	Price
t_1	Adobe Acrobat 8		299.99
t_2	Acrobat 8	Adobe	299.99

(c) dirty

Figure 2: Tuple pair examples for object comparison task (Mudgal et al. 2018).

	A	B	C	D
1	Task 1			
2	Instruction: Are the following two objects same?			
3	Operation: Please choose the 'same', or 'different'			
4	Name	Attribute1	Attribute2	Attribute3
5	Object1	XXX	YYY	123
6	Object2	XXX	ZZZ	234
7	Operation: Please choose the 'same', or 'different'			

Figure 3: Example of original visual task

	A	B	C	D
1	Task 1			
2	Instruction: Are the following two objects same?			
3	Operation: Please choose the 'same', or 'different'			
4	Name	Object1	Object2	
5	Attribute1	XXX	XXX	
6	Attribute2	YYY	ZZZ	
7	Attribute3	123	234	
8	Operation: Please choose the 'same', or 'different'			

Figure 4: Example of axis consistent visual task

gration (see Figure 2).

This demo shows that consistency in navigation is an important factor for better design of such a task, by letting the audience compare tasks designed according to different principles.

We introduced the concept of axis consistency in the task design. The concept of axis consistency derived from cognitive consistency (Heider 1946; 1958; Simon, Snow, and Read 2004). Human tend to think consistent. Compared to the original task (Figure 3), Figure 4 is a axis consistent task. In Figure 4, the question, operation and attribute name are only included in the first column. The other columns are attribute content, that is, what crowd worker compare. In Figure 3, there is a mix of content in the same column. Therefore, we called the Figure 4 axis consistent task.

Demonstration

In the demonstration, we have the audience perform AM tasks in a variety of design principles with two scenarios.The participants will understand the principle heavily affects the performance. Based on their experience, we will discuss with them what good principles are and exchange ideas on microtasks in different modalities.

Scenarios

S1: User Matching With question and instruction, two entities of social media users including all attributes were shown to crowd workers. Based on these attributes, crowd workers were asked to answer whether two social media users are the same or not.

For the scenario, we use Instagram public user data crawled from the Instagram API in May of 2016, include user name, bio, full name, the number of media, the number of followed by and the number of follows [2].

S2: Product Comparison. In the second scenario, we demonstrate tasks for product comparison.

For the scenario, we used the public data of shop products on Kaggle [3]. It contains information on the price and the rating of products used in this study.

Setting and Procedures

In the demonstration, each participant performs AM tasks, while putting on an eye mask and a headphone. He or she tries to perform several tasks in different design principles, and will be shown their performance. The accumulated results will be shown to the audience, through a large display. This makes it easier for them to understand the difference in the performance of workers among AM Tasks in different design principles.

Conclusion

The demo shows that consistent audio matrix task design is effective for understanding entity resolution tasks with no visual representation.

In future work, we shall explore the transforming method. we shall also explore more additional datasets or other languages.

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[2]Data set: https://bit.ly/2MtZw6W

[3]Kaggle: https://www.kaggle.com

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