Explicit User Input Quality Determination Based on Implicit User Input

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Implicit feedback can provide us with information that we can use to help us evaluate online questionnaires. Using this information, we could eliminate number of necessary explicit feedback and we can better evaluate the results. This would allow us to simplify the questionnaires and also improve the result quality. Explicit information from the user may be incomplete or misleading. This is currently being dealt with using complicated questionnaires and forms asking the same question multiple times differently, to avoid getting misleading information.

Using implicit measures as pupil dilation or eye-tracking we have created first model for deception detection in environment of online questionnaires. We are currently working on verifying of our first results and creation of new metrics, that can be used to improve our model, based on galvanic skin response or EKG.

Lying is part of everyday life. According to studies, people use lies at least once or twice a day. Most common are lies about personal preferences and feelings, but people are also lying about their actions and plans or achievements and pitfalls. People tend to lie more often if they can get psychological reward from the lie and less often if they are trying to avoid punishment [1].

According to meta-analysis which analyzed 116 of different studies with 120 of different samples, there are at least 158 different metrics that were tested if they can be used for deception detection. However most of these have only weak or none links to the deception detection [1].

To propose our method, we needed to collect implicit user data for analysis. Our criteria were, that these data should be good indicators of cognitive load and deception and should also be easily collectable from user when they are filling out online questionnaires. Based on our research we picked as our main source of data an eyetracker, which can provide us with information about the region of the screen user is looking at, his fixations and saccades, response times and also pupil dilation. It was

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demonstrated in [2] that eyetracking can serve as deception indicator. Pupil dilation is good indicator of deception and cognitive load according to several studies [3].

To collect the data, we used infrastructure available in Faculty of Informatics and Information Technologies of Slovak Technical University which consist of laboratory with 20 computers equipped with Tobii Pro X2-60. These eye-trackers are capable of collecting 60 information per second about each of the user eye position and pupil dilation.

The infrastructure also can collect data synchronously from eyetracker and questionnaire system. This was used to tag the eyetracker data with events and user interactions in questionnaire system. We also used more options that our infrastructure provided us with. Along with the eyetracker data, we were also collecting video from the users' screens and keyboard and mouse interaction with the computer.

Accuracy of our model is not yet sufficient for reliable deception detection, but with more metrics retrieved and added to our model we expect it to get better. It is important to point out, that we can rate every answer from questionnaire as truthful or deceptive, so if we want to tell if entire questionnaire is answered mostly truthfully, lower accuracy is needed as if we wanted to point to deception of concrete answers. In near future we therefore see more potential in using our or similar models to evaluate questionnaires as a whole.

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