

Input Observer - Quick Start Guide

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This quick start guide is for researchers and developers who intend to use the Input Observer to understand text entry and pointing performance in everyday computer use. (For instructions to give to participants, please see the Deployment section below.)

You will need:

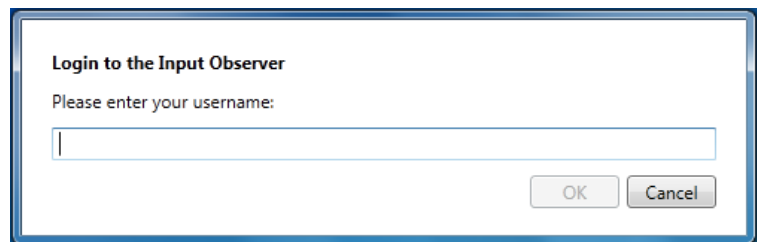
- A Windows computer.
- Amazon Web Services and Mechanical Turk Requester accounts. See <http://aws.amazon.com/mturk/>. You do not need to provide billing information to get started.
- A Windows Azure Marketplace account with a subscription to the Bing Search API. See <https://datamarket.azure.com/>. For a fuller explanation of the Marketplace, see <http://msdn.microsoft.com/en-us/library/windowsazure/ff717655.aspx>.
- A web server with an FTP account to store the Mechanical Turk external HIT files.

BEFORE DEPLOYING THE INPUT OBSERVER

① Download and extract the Windows executable, *InputObserver-app.zip*, and the Mechanical Turk files, *InputObserver-mturk.zip*, from <http://depts.washington.edu/aimgroup/proj/io/>.

② In the *InputObserver-mturk* folder, upload the following files to your web server: *index.html*, *turk.html*, *jquery-ui-1* (folder), and *turk.swf* (the only file you do not need to upload is *turk.fla*).

③ Open the *InputObserver-app* folder and run the Input Observer (*InputObserver.exe*). You will be prompted to enter a username. Type "researcher" and click OK.



Login to the Input Observer

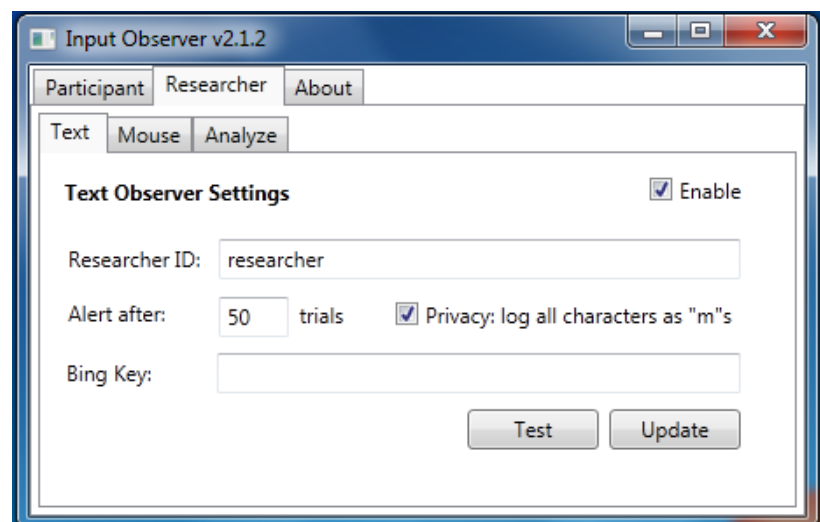
Please enter your username:

OK Cancel

BEFORE DEPLOYMENT - STEP 3: TYPE "RESEARCHER" AND CLICK OK

④ The *Researcher* tab will open with the *Text* tab selected. On this screen you can change the default researcher username and the settings for text entry data recording.

- Change the default researcher username in the *Researcher ID* text box. The researcher username is what enables researchers to log in to the Input Observer in researcher mode to configure the tool for participants. This text box will only accept letters and numbers.



Input Observer v2.1.2

Participant Researcher About

Text Mouse Analyze

Text Observer Settings ☒ Enable

Researcher ID: researcher

Alert after: 50 trials ☒ Privacy: log all characters as "m"s

Bing Key:

Test Update

BEFORE DEPLOYMENT - STEP 4: TEXT ENTRY CONFIGURATION OPTIONS

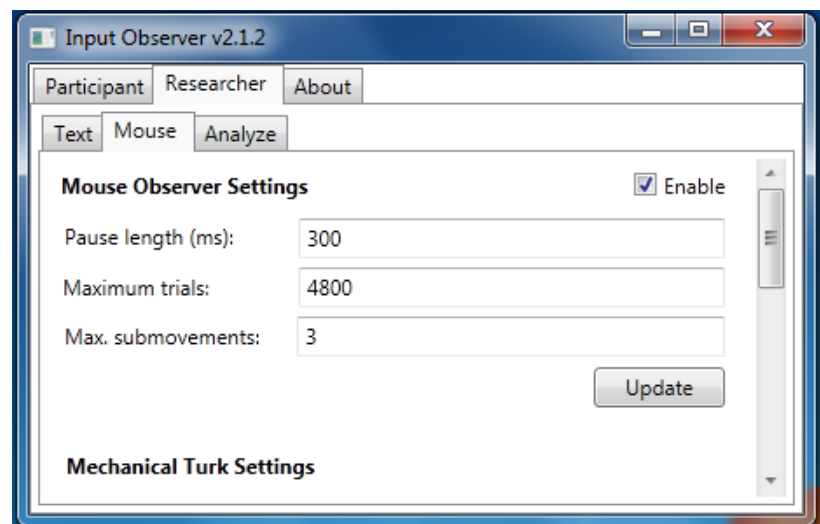
- By default, text entry data recording will be enabled for all participants. To turn off text entry recording, uncheck the *Enable* checkbox.
- When the Input Observer is recording text entry data on a participant's computer, it will alert the participant when a minimum amount of data has been recorded. The Input Observer continues to record data once the minimum amount of data has been reached, but this setting helps to ensure that your participants record enough text entry data. By default, the minimum amount of data is 50 "trials." Note: the actual number of trials may change after analysis of the log files as further trial segmentation is done at that point. It is a good idea to set the minimum number of trials to be at least 20% higher than the number you actually need.
- By default, the Input Observer disguises all letters in the text log files as "m"s in order to protect participants' privacy. Uncheck *Privacy: log all characters as "m"s* to log characters as they were typed.
- In the *Bing Key* textbox, enter your Windows Azure Marketplace Primary Account Key. You can find your Account Key by logging in to your Marketplace account at <https://datamarket.azure.com/> and selecting *My Account*. In the Input Observer, test that you have entered your Account Key correctly by clicking *Test*. The test result will be shown in an alert box.
- Click *Update* to save your changes.

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Click the Mouse tab to see the configuration options for mouse data recording. You may wish to resize the Input Observer window to see all of the Mouse options at once.

Under the heading, *Mouse Observer Settings*:

- By default, mouse data recording is enabled for all participants. To turn off mouse data recording, uncheck the *Enable* checkbox.
- A mouse movement is considered to have ended when there has been no movement for the amount of time given in the *Pause length* text box.
- In the *Maximum trials* text box, enter the maximum number of pointing trials that can be recorded by each participant. The maximum number of

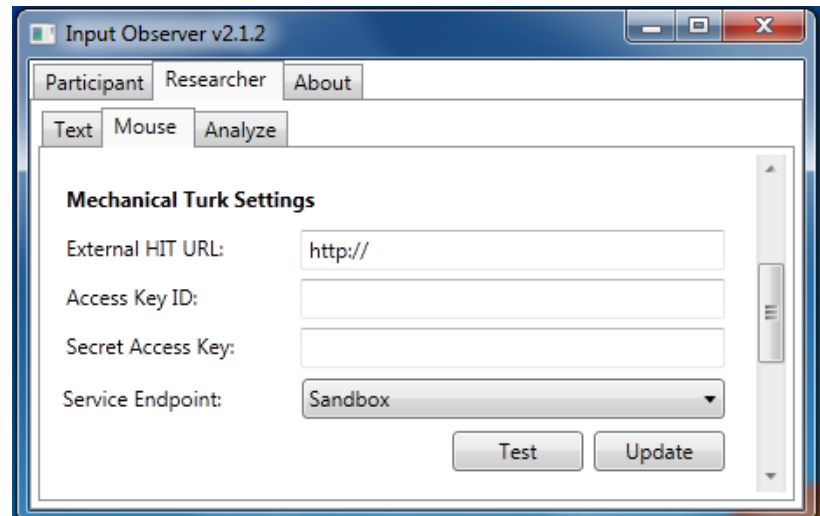


BEFORE DEPLOYMENT - STEP 5: MOUSE CONFIGURATION OPTIONS

- trials should be determined based on your budget for Mechanical Turk HITs. For every pointing movement recorded, three Mechanical Turk HITs (\$0.02 each) are created. Thus, for 4800 trials, there would be a cost of $4800 * 3 * \$0.02 = \288 . However, if you wish, you can run the Input Observer without incurring these costs by switching the *Service Endpoint* to *Sandbox* (see below).
- *Max. submovements* is the maximum number of submovements allowed for a mouse movement recorded by the Input Observer to be considered an aimed pointing attempt. Movements with more than the specified number of submovements will not be logged.
- Click *Update* to save your changes.

Under the heading, *Mechanical Turk Settings*:

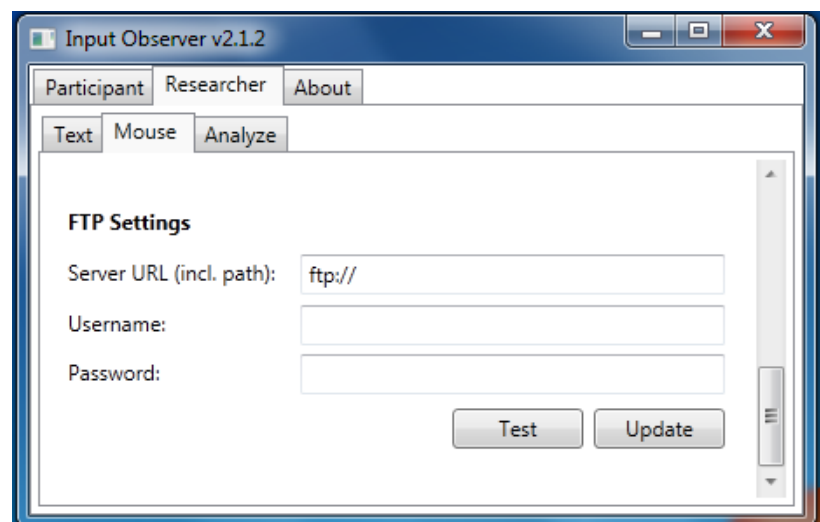
- In the *External HIT URL* text box, enter the full URL of the *index.html* file you uploaded to your web server in step 2.
- *Access Key ID* and *Secret Access Key* are identifiers unique to your Mechanical Turk requester account. You can find these identifiers by logging in to Mechanical Turk at <http://aws.amazon.com/mturk/> and selecting *My Account* from the *My Account / Console* dropdown menu. Choose *Security Credentials* from the *Account* menu. Your Access Key ID and Secret Access Key can be found under the heading, *Access Credentials*.
- The *Service Endpoint* combobox allows you to choose where the HITs generated by your participants' use of the mouse will be published. The *Sandbox* publishes HITs to <https://workersandbox.mturk.com/>. The sandbox is for testing purposes only and does not require a prepaid balance in your Mechanical Turk account. Selecting *Live Site* will make HITs generated by the Input Observer available to Mechanical Turk workers and does require a prepaid balance sufficient to cover the number of HITs published by the Input Observer (\$0.06 per movement - 3 HITs valued at \$0.02 each). To prepay for HITs, log in to your Mechanical Turk requester account at <https://requester.mturk.com/>, go to *Account Settings*, click on *Prepay for Mechanical Turk HITs* and follow the instructions on that page.
- Test your Mechanical Turk settings by clicking the *Test* button.
- Click *Update* to save your changes.



BEFORE DEPLOYMENT - STEP 5: MECHANICAL TURK SETTINGS

Under the heading, *FTP Settings*:

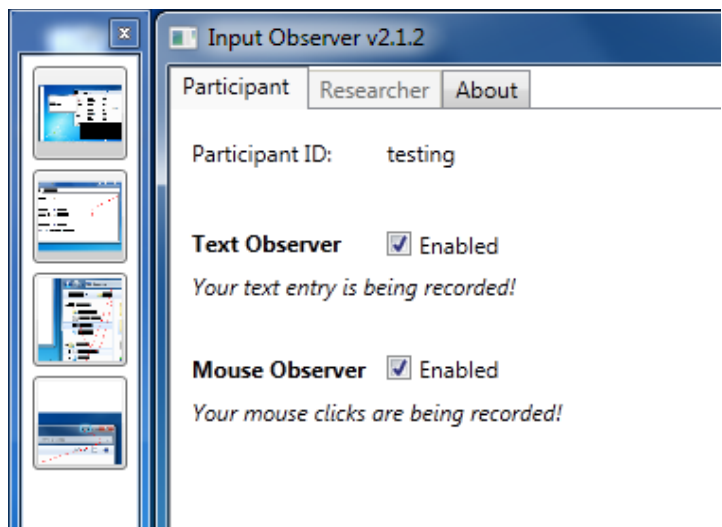
- In the *Server URL* text box, enter the full ftp address (starting with ftp://) for the web server where you would like to store the images uploaded to Mechanical Turk. The images will be stored in a folder named "targets" (automatically created) at the address specified.
- Enter your FTP username and password in the *Username* and *Password* textboxes.
- Test your FTP connection by clicking the *Test* button.
- Click *Update* to save your changes.



BEFORE DEPLOYMENT - STEP 5: FTP SETTINGS

DEPLOYMENT

Once you have configured the Input Observer according to the instructions above, you can send the *InputObserver-app* folder to users. To begin collecting data, instruct participants to open the *InputObserver-app* folder and run the Input Observer (*InputObserver.exe*). They will be prompted to enter a username. The username is used to name the log files recorded by the Input Observer and the images sent to Mechanical Turk. The username does not have to be set prior to the Input Observer being first run by a participant, but each participant's username should be unique to avoid conflicts in file names when images are uploaded to your web server. Usernames may only contain letters and numbers.



DEPLOYMENT: PARTICIPANT VIEW

Participants will not have access to the *Researcher* tab and so will be unable to change your settings.

However, in the *Participant* tab, a user can turn text /mouse recording on and off at will using the checkboxes. Note that, if text and/or mouse recording was disabled in the *Researcher* tab, the participant will not be able to turn on recording of that information when they run the Input Observer.

While mouse recording is enabled, all screenshots will be shown as thumbnails in a “filmstrip” on the side of the screen for two minutes prior to being uploaded to your web server and Mechanical Turk. A user can see a fullsize version of an image by mousing over the thumbnail. An image can be removed from the recorded data by right-clicking the thumbnail.

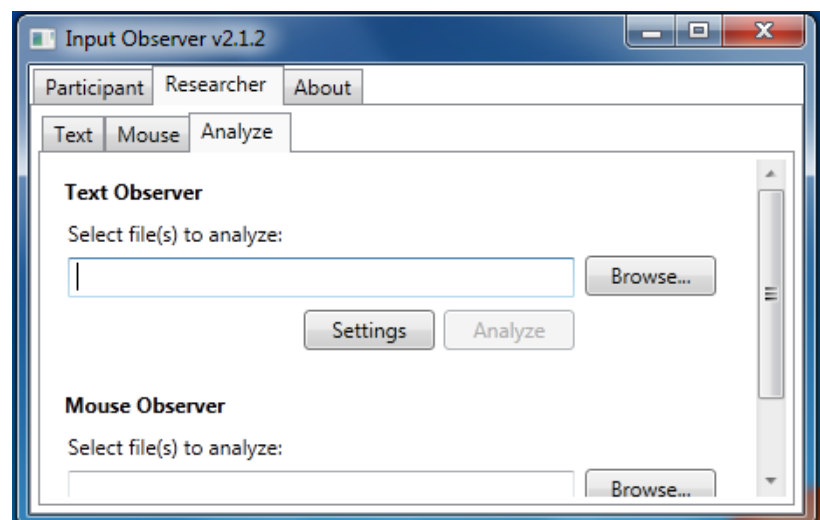
Text and mouse data are logged in XML files beginning with the participant's username. At the end of deployment, participants should send all log files generated by the Input Observer to the researcher for analysis.

AFTER DEPLOYMENT - ANALYZING PARTICIPANT LOG FILES

Run the Input Observer, log in as a researcher, then select the *Analyze* tab.

To analyze text entry log files:

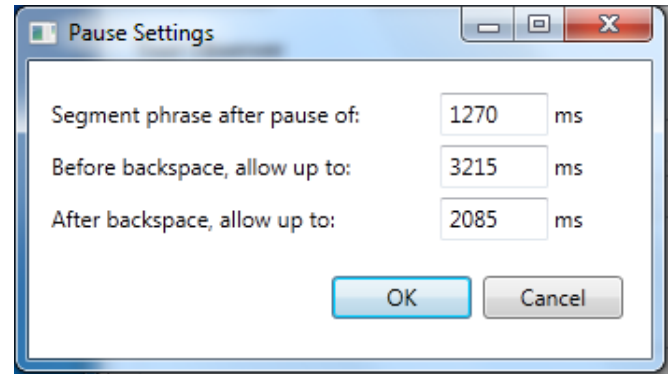
- 1 Use the *Browse* button under the heading *Text Observer* to select the relevant log files. You can select multiple log files at a time, but they should all be from a single participant.
- 2 To adjust the default segmenting pauses, click *Settings* and edit the values in the popup window. For an explanation of the three types of



AFTER DEPLOYMENT - STEP 1: SELECT TEXT LOG FILES

pauses and the default values, see Evans and Wobbrock, 2012, linked below. Adjusting the pause lengths does not change the original log files so you may complete this step multiple times with different pause lengths. Click *OK* to save your settings.

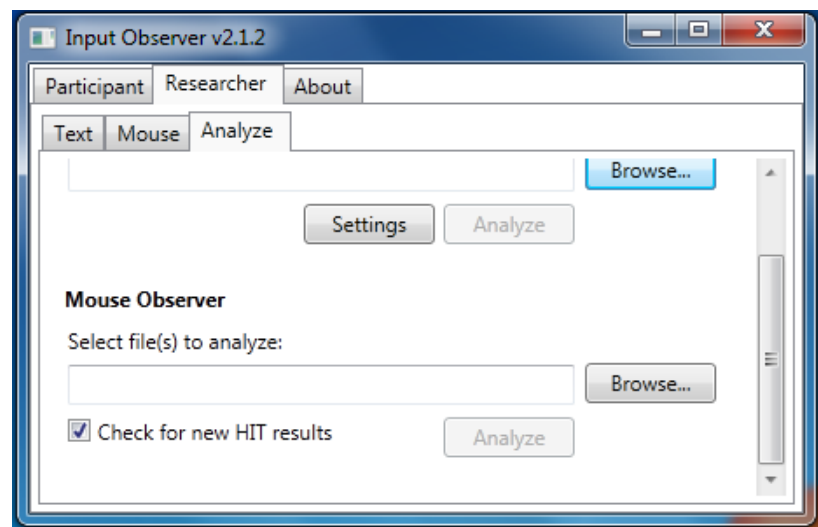
- 3 Click *Analyze* to analyze the text log(s). When analysis is complete, you will be prompted to save a CSV file with the results.



AFTER DEPLOYMENT - STEP 2: SET TEXT ENTRY PAUSE VALUES

To analyze mouse log files:

- 1 The first time you analyze a participant's mouse log files, *Check for new HIT results* should be checked in order to download the Mechanical Turk results. Downloading the results can take a long time, so if you do not expect new results, uncheck this box to speed up the analysis.
- 2 Use the *Browse* button under the heading *Mouse Observer* to select the relevant log files. You can select multiple log files at a time, but they should all be from a single participant.
- 3 Click *Analyze* to analyze the mouse log(s). When analysis is complete, you will be prompted to save a CSV file with the results. NOTE: The Input Observer uses clustering algorithms to create A x W "conditions" from the pointing data. The created conditions will likely be different each time the analysis is run. The amount of variation depends on the nature and amount of the data collected. We suggest that you analyze participants' log files multiple times and average the Fitts' law throughput results if appropriate.



AFTER DEPLOYMENT: ANALYZE MOUSE LOG FILES

For more information:

Evans, A.C. and Wobbrock, J.O. (2012). [Taming Wild Behavior: The Input Observer for Obtaining Text Entry and Mouse Pointing Measures from Everyday Computer Use](#). Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI '12). Austin, Texas (May 5-10, 2012). New York: ACM Press, pp. 1947-1956.