Frequently Asked Questions

1. What kind of unique features does this software have?

Compared with other software, this software package has the following unique features:

- **Precision timing:** millisecond precision of stimulus presentation, and data collection.
- **High synchronization:** direct control the video/audio cards and triggering ports to highly synchronize presentation and data collection.
- **Unique modules:** well-designed module for advanced task (subject-feedback based responses)
- **Quality Controls:** create sophisticated stimuli with optimized parallel and links patterns
- **High-Quality Display:** Increased display speed for bitmap transfers
- **Intuitive GUI:** Drag and drop graphical interface for experiment design.
- **Click-run:** a single mouse click will run the entire paradigm.
- **Paradigm Merge:** Quickly and easily combines your single session data files for group analysis.
- **Accurate Event Logging**: recording the presentation timing, triggering and responses.
- **Video:** play movies/video with precise time and frame control
- **Picture:** capture screen image and show image in many formats
- **Sound:** record sound (subject's vocalizations) and play sound in many formats.
- **Multiple-Monitor and Video cards:** Support for presentation on multiple video displays
- **Monitor:** Monitor responses and display stimuli on attached monitors/projectors
- **Multi-Languages:** Support for UNICODE and international fonts
- **Editor:** Copy & paste stimuli between experiments
- **Multiple-Ports:** Support for Serial port device, Parallel Port Device, USB port Device
- **Unique Test Module:** Easier interfacing with external devices
- **Auto-Parameter Checking:** no debugging is necessary
- **Professional design:** enormous options for presentation modalities
- **Extensive tests:** fMRI, EEG (ERP), MEG (ERF), single neuron recording, reaction time.
- **Widely used:** behavioral, psychological, physiological experiments and performance measures.
- **Power Utilities:** experiment and subject control (see Feature list for details)

2. Can I install the new version of BrainX if I currently have BrainX old version installed?

Yes. BrainX will support what is known as a "side-by-side" installation where both old and new version of BrainX can be on the system at the same time. Experiment files can be typically upgraded from old version to new version, but once converted to the new version format (.es2), the experiments cannot be accessed through the old version. Therefore, it is a good idea to back up the old file for possible use.

3. Will the old version of BrainX paradigms/tasks be compatible with the new version of BrainX?

Yes. Most old BrainX paradigms/tasks will upgrade into new version BrainX without error or significant modifications. However, once converted to the new version format, the experiments cannot be accessed through the old version. Therefore, it is a good idea to back up the old file for possible use.

4. Have you tested the functionality of BrainX with real data?

Yes, we have tested the functions. It worked well in our tests, which include SEF, AEF, VEF, MEF and language.

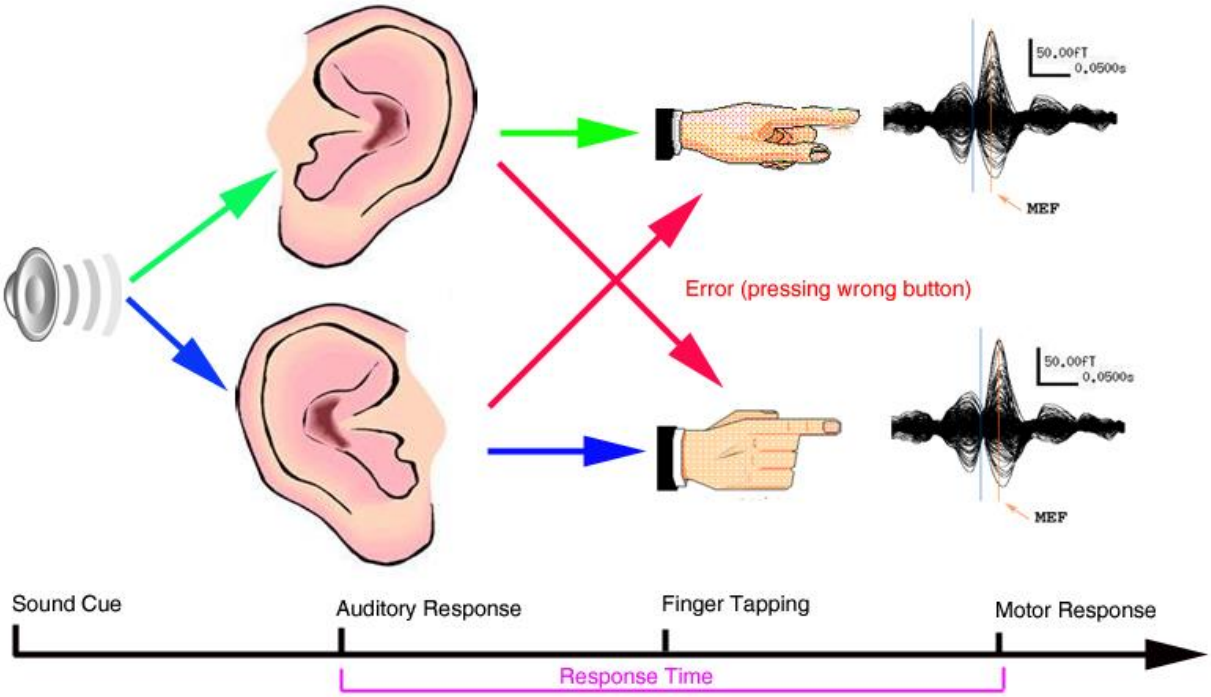
http://sdrv.ms/PHenGK

For the green version, no installation is necessary. You should be able to run it by simply unzipping the fold and clicking the "BrainX.exe" file.

5. What does "Pattern Link" mean? Can you give me an example?

Pattern Link means a pattern that links more than one stimulus (or presentation). Typically, Pattern Link should include at least two stimuli; otherwise, it can be replaced with a single stimulus.

For example, Pattern Link can be used to design "sound-cued finger-tapping" task. Since the "cue and the tapping" is always linked, Pattern Link is suited for designing this paradigm. Here is the illustration.



We consider “Pattern Link” is powerful because users can treat Pattern Link as one stimulus to be randomized in a more sophisticated paradigm. For example, sound cue can be delivered to the left or right ear and subjects can be asked to type left or right finger respectively (see the above figures).

6. Is it possible to record response time? How to record the time?

Yes, there are several ways to recording response time and responses keys.

1. The first one is to record a log file (Menu File->Setup Log File, make sure to check the “Record Log File”). The log file will record all the stimuli, the pressed keys (or the LumiTouch buttons). The log file should be a text file; you may open/import it to Microsoft Excel for computing the time. Please note that the time is “computer time in micro-second”. To compute the duration, you may subject the late time to the previous time. For example, you have time log:

Face sad, 78936

Key 1, 78946;

Face happy, 78956

key 1, 78966

…

key 1, 79946

“Face Sad” should be the file name of the stimuli. “Key 1” indicates the pressed key is number “1”.The duration between the face stimuli and the key press = 78946-78936 = 10; The duration between the first key and the second key = 78966 -78946 = 20

2. The second method is to setup the finger response time (Menu Sensorimotor->Add Motor…” or Menu Tools->Setup Input Route Trig..”). If you like to record each key from the “LumiTouch”, you can select the “Ten Movements” to record the trigger for each key. For example, button “1” sends trigger 1.

If you just like to capture response time (any keys), you may simply select “Any Movement” and the click “Setup Trigger” to send a trigger to the MEG system. Please note the, the response trigger (press button induce trigger) should be different from any stimulation trigger (such as the face picture) because the MEG system separate the response and stimuli by using the triggering number.

7. Where and How to download the BrainX software?

If you are reading this file online, you may already see the BrainX program because this file typically comes with the BrainX program or software. If you read this file offline, here is the website to download the BrainX program:

http://sdrv.ms/PHenGK

Once you identified the software which you are interested in, please select it and press the Right Mouse Button. Then, you can select the "Download" Menu. Once you "Click" the "Download" sub-menu, the Browser (e.g. Internet Explorer, Firefox, Chrome…) should start to download the file.

The BrainX Program has more than hundreds of files. For you convenient, all files have been "wrapped up" and compressed as a single file for fast and easy transfer. Once you downloaded the compressed file (single file), of course, you need to uncompress it (typically, unzip it). The unzipped BrainX program should unzip all files into one fold which has approximately 666 files (in 2012, it may increase or decrease in the future).

We regularly update the software, thus, please check the website for any updates.

8. Do I have to install the software? Is it complicated to install the software?

No. The "green" version of BrainX can be used on Windows 7 (64 bit) without installation. The procedure is very simple: (1) copy the fold of the entire BrainX to your computer, where you like to store it; (2) run "BrainX" by double-click the "Brainx.exe" file.

For your convenience, you may make a short-cut with the following steps: (1)select the "BrainX.exe" file; then (2) press the right Mouse Button; (3)click the "Create short cut" sub-menu in the "Pop up" Menu; (3) drag the created short-cut to the desktop. You may rename the short-cut if you like.

If you do not like it, you may simply delete the entire fold and the software should go completely without taking any of your computer space. Noteworthy, the software does not change any of the settings of your computer. There is no virus, no malware, and no junk item. Thus, the software is pretty "healthy" and "green".

9. I tried to run the BrainX but got an error message – For example, "The program can't start because mfc100u.dll is missing". What's wrong?

You may need to install a small update from Microsoft Company called "vcredist_64" or "vcredist_32". We have downloaded it and put it in the same fold of the BrainX. You may select the correction version that matches with your windows and install it

Once you download the file, please install it (since it is from Microsoft Inc., it should be safe) and try again.

You may also check the Microsoft website to find any updates that are needed for running new software developed with Visual C++ 2010, which is the IDE used for compiling BrainX (2010-2012).

If you downloaded the new version of BrainX *VS2013*, you may also check the Microsoft website to find any updates that are needed for running new software developed with Visual C++ 2013, which is the IDE used for compiling BrainX (2013-2014).

10. I tried to run the BrainX on Windows XP and Window 7 (32 bit), but got an error message about compatibility. What's the problem?

Our work currently focuses on Windows platform, in particularly, 64-bit Window 7 and Window 8 because many users requested 64bit version. Therefore, the updated version of BrainX has been extensively tested on 64-bit of windows. If you run our new software on 32-bit windows, you have to download the 32 bit version, which seems to be less popular.

Though BrainX 32 bit version does work on 32 bit windows. However, please use 64 bit version of our software (we may also move to 64 bit Mac or other OS, but not 32-bits). We consider that 64 bits OS is the future of computer because 64 bits OS supports more memory and can process a huge amount of data efficiently.

Please also note that BrainX needs different drivers for 32 and 64 bit windows if you would like to access or control the parallel ports.

11. What kind of computer do I need to run BrainX?

Though the software package (Dec. 2012) was developed on a workstation with very high configuration (e.g. it has 144 GB memory), the software package has been tested on office desktop computer as well as notebook/laptop with 3 GB memory. Here is an example for desktop computer:

- Windows 7 or 8 (64 bits)
- 3rd generation Intel(R) Core(TM) Processor (2.7 GHz, 8MB L3 Cache)
- 24GB DDR3 System Memory
- 1 TB Hard Drive
- NVIDIA(R) GeForce(R) GT 650M Graphics with 2GB GDDR 5 video memory
- 20-inch LED Display (1920 x 1080, 32 bit color)
- 8X DVD+/-R/RW
- Standard Keyboard

12. I tried to run the BrainX on Windows 7/8, but I got an error message about "missing D3dx9_34.gll" something like that, what's the problem?

The new version of BrainX should not have such kind of problems, you may update the software. However, You may see these problems in the old version of BrainX running in Windows 7 and older. BrainX uses Direct3D to render 3D images. If your computer does not have Direct3D dlls which are included in DirectX from Microsoft Inc., the program will show error messages. Please download the latest version of DirectX from the website or copy the "dxwebsetup.exe" file coming with MEG Processor. You may also download the file from the following link:

http://1drv.ms/SiVZHn

Once you download the file, please install it (since it is from Microsoft Inc., it should be safe) and try again.

Please note that BrainX supports both Direct3D and OpenGL. BrainX (~2012) currently supports Direct3D 9.0.

13. is there any publications used this software? can you show me any example?

Yes, many papers used this software. You may find some sample publications related to high-frequency oscillation in the following website:

http://clinicaltrials.gov/ct2/show/NCT00600717

14. What is the difference between "green version" and "non-green version" (installation version)?

BrainX has been frequently used in MEG, EEG, fMRI, TMS, neurology, neuropsychology, and psychiatry and brain function/behavior tests. To send or receive triggers to MEG/EEG/fMRI/TMS, BrainX is typically installed on a dedicated computer and has to access many kinds of ports (e.g. parallel, serial and USB) to control a variety of kinds of devices. In most of cases, time is critical. Many users do not like any software to change the settings, consequently, it is idea to have a software work without installation that typically change the settings by default. To solve this problem, we compile and provide both "green version" and "non-green version".

The green version can run on a computer without installation.

The non-green version requires installation, which is typically used by users who is not familiar with computer because it automatically installs and setup everything for BrainX to run.

15. How to run a task/paradigm/ stimulus designed with BrainX?

There are three steps:

1. Double-click the BrainX file (or drag-and-drop a file onto BrainX ) to read the file into BrainX
2. Click the "Run" button,  to start task Window, which controls the entire computer and show flashing "usage" (e.g. "START: RETURN || STOP: ESCAPE", the designer can change/edit it)
3. Press the "Return" key to start the task; press the "Escape" key to stop the task.

16. Can you show me how to design a visual task/paradigm/ stimulus with BrainX?

There are three steps:

1. Drag-and-drop a picture (photo/image) file onto BrainX (or Click the "Add/Insert Picture" icon  or Visual->Add/Insert Picture" menu to open a file), which will automatically read and make a visual stimulus
2. Click the "Run" button, to start task Window, which controls the entire computer and show flashing "usage" (e.g. "START: RETURN || STOP: ESCAPE", the designer can change/edit it)
3. Press the "Return" key to start the task; press the "Escape" key to stop the task.

17. Can you show me how to design an auditory task/paradigm/ stimulus with BrainX?

There are three steps:

1. Drag-and-drop a sound (.mp3/.wav) file onto BrainX (or Click the "Add/Insert Sound" icon  or Visual->Add/Insert Sound" menu to open a file), which will automatically read and make an auditory stimulus

2. Click the “Run” button, to start task Window, which controls the entire computer and show flashing “usage” (e.g. “START: RETURN || STOP: ESCAPE”, the designer can change/edit it)

3. Press the “Return” key to start the task; press the “Escape” key to stop the task.

18. Can you show me how to design the conventional “checkboard”?

There are four steps:

1. Lunch BrainX and Select “Visual->Design Checkboard” menu. A “Block Board Settings” Dialog will appear.

2. Change parameters (if necessary) and Click “OK” button to make a checkboard.

3. Click the “Run” button,  to start task Window, which controls the entire computer and show flashing “usage” (e.g. “START: RETURN || STOP: ESCAPE”, the designer can change/edit it)

4. Press the “Return” key to start the task; press the “Escape” key to stop the task.

19. How to improve/edit/modify a designed task/paradigm?

There are three steps:

1. Open the task and double-click the stimulus on the top panel, a dialog for designing the task/stimuli will show up.

2. Change parameters and Click “OK” button to keep the changes.

3. Click the “Run” button,  to start task Window, which controls the entire computer and show flashing “usage” (e.g. “START: RETURN || STOP: ESCAPE”, the designer can change/edit it)

4. Press the “Return” key to start the task; press the “Escape” key to stop the task.

20. What shall I do if I found some bugs? Is there anyone who can answer my question(s)? May I send comments and suggestions to the programmers?

Please feel free to send emails to:

BrainX@live.com

21. We have ideas to study the brain. Can you design a paradigm for us?

Yes, we can design paradigm for you. If it is simple, it is free. However, it is a sophisticated paradigm or task; you should financially support our work. You may donate some money or funding. You may also pay for our time.

22. We would like to use computer to control several electrical/mechanical devices. It requires several parallel port cards. Can you help us to build a customized computer?

Yes, we can build a customized computer for you. If it is simple, it is free. However, it is a sophisticated configuration; you should financially support our work. You may donate some money or funding. You may also pay for our time.

23. Can BrainX control MEG/EEG and Electrical stimulation device simultaneously?

Yes. BrainX supports at least 9 parallel ports, 3 serial ports and 3 USB ports. All the devices can be synchronized and controlled by BrainX.

24. Can I use MEG/EEG/fMRI/TMS device to start/stop the task/paradigm/stimulus in BrainX?

Yes. BrainX allows user to start/stop the paradigm with a variety of keys or numbers. For example, a fMRI system can send a key (e.g. “b”) to start the paradigm. Similarly, a fMRI system can also send a key (e.g. “e”) to stop the paradigm.

25. We tried many similar software packages, which have trigger jittering. How about BrainX?

We have developed many techniques to minimize and eliminate trigger jittering. In fact, our software can directly control auditory, video and PCI cards. In addition, BrainX can also directly control the parallel ports, serial ports and USB ports. We believe BrainX is one of the best software package that have no or minimal trigger jittering.

26. To precise measuring the time and performance, we would like to control the time and shape of the triggering pulse, can BrainX do those?

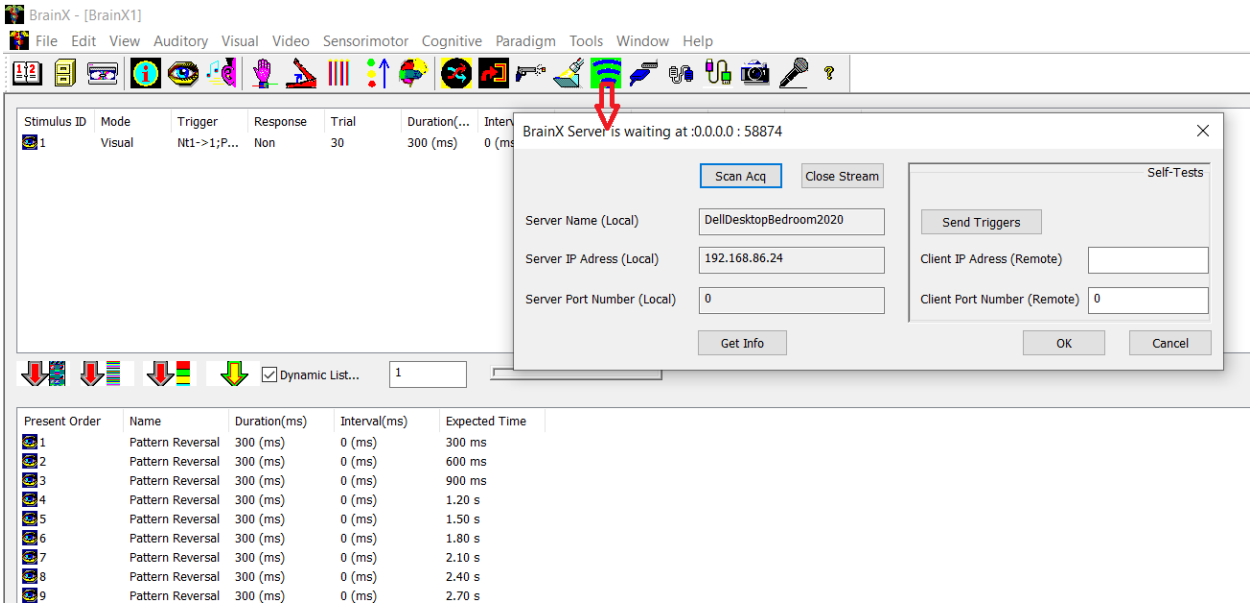
Yes. BrainX provides GUI to design, test and control the time and shape of the triggering pulse. In fact, we also provide software for your to check, visualize and measure the trigger pulses.

27. Your software is interesting. Can you tell me about the programming team?

We are a group of people working in MEG, EEG, fMRI, TMS, neurology, psychology and psychiatry and brain research. We hope to develop a software package with precise time, easy to use, and powerful in creating innovative behavioral and physiological experiments. The first version of the software was based on MS DOS, it has then been developed on Windows 95/98/XP/Vista/7/8/10. We consider BrainX is a power tool for cognitive neuroscience, for better understanding the brain mechanisms of sensation, perception, emotion, action, self-awareness. From clinical point of view, BrainX has been used for pre-surgical functional mapping (somatosensory, motor, auditory, visual, language and any combination of them). In addition, BrainX provides precise timing for measuring response and selections. The software enables clinicians and scientists to study a complete range of perceptual and cognitive processes by creating, distributing, and commercializing innovative experiments in many areas. We have been continually improving its functionality, add new capabilities. We believe BrainX can help clinicians and scientist to complete their work efficiently.

28. Can I link BrainX to data acquisition software through network or Wi-Fi?

Yes, the new version of BrainX supports network and/or Wi-Fi connection. This new feature eliminates the need of cables for sending trigger from stimulation computer to the data acquisition computer.



29. I would like to study functional brain activation optically pumped magnetometers (OPMs). Can I use BrainX to do it? How to synchronize the OPM signals along with the BrainX presentation (e.g., pictures, and sounds)?

Yes, you may use BrainX to study brain function. BrainX can synchronize presentations (e.g., pictures, sounds, words) along with data digitization through wireless and wired connections. One of the wireless methods is Wi-Fi. Wired connections include serial port cables, parallel port cables and USB cables. You typically just need one connection that suitable for the data acquisition software. For example, AcqManager is one of the data acquisition software that supports both OPMs and EEG. The two software packages (BrainX <-> AcqManager) can synchronize the OPM signals along with the BrainX presentation natively (e.g., automatically scan the Wi-Fi connection and then synchronize the recordings and presentations.

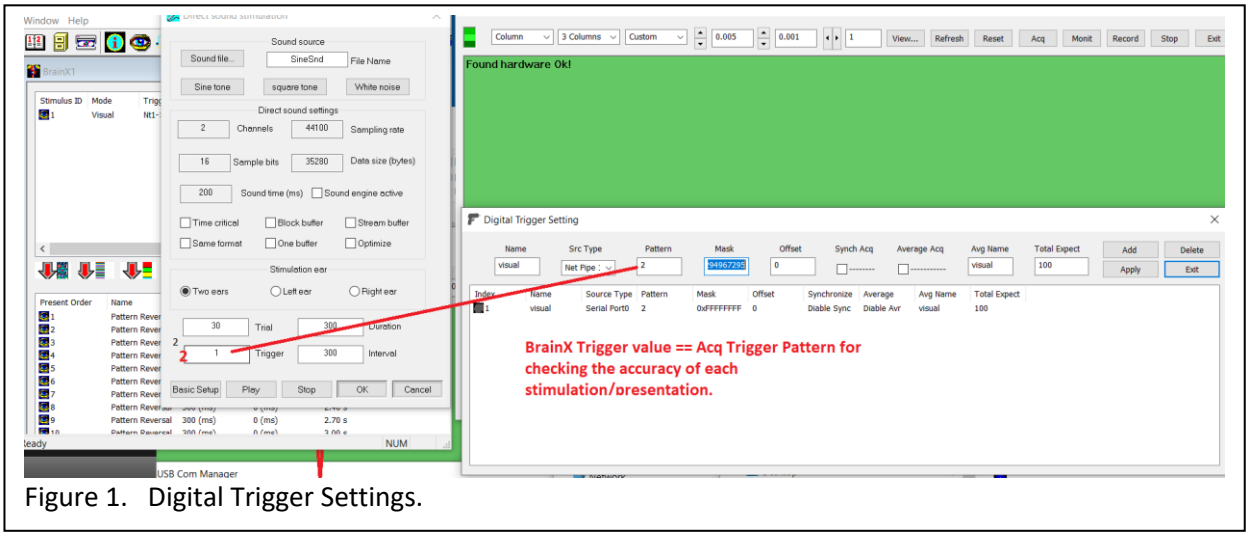


Figure 1. Digital Trigger Settings.

30. How many triggers (types of stimulations) are designed in BrainX?

Theoretically, BrainX supports more than 256 triggers by using Wi-Fi or serial port cables. Practically, you may use up to 256 triggers to avoid any potential trigger jittering and significant delay.