ns_Converter Manual

Ver. 1.1

2011/07/01

Introduction

This is the *ns_Converter* manual.

ns_Converter converts neurophysiological data into the Neuroshare format (※1) with *ns_CreateFile* class library (※2).

ns_Converter can only be applied to a finite set of file formats (※3).

ns_Converter is a set of Matlab functions.

ns_Converter is OS-independent, except some functions (※4).

ns_Converter was tested on Matlab R2010a, using Windows 7 Professional.

※1   Neuroshare format :

The file format defined by the project to create a standard format for neurophysiological data.

Please see http://neuroshare.sourceforge.net/ for more detail.

※2   ns_CreateFile class library :

The library (a set of Matlab functions) to make a Neuroshare format file.

You can download it from http://www.cns.atr.jp/dni/download/data-sharing-tool/ .

※3   Applicable formats :

Please see Applicable format list .

※4   OS dependent functions :

Some functions can run on only 32-bit Windows.

Please see Restriced to 32-bit Windows for more detail.

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Applicable format list

ns_Converter can convert the following file formats.

ext.	description	note
.csv	CSV (Comma Separated Values)	There's a rule of format of file. Please see Format of CSV-file .
.map	Alpha Omega file	Restricted to 32-bit Windows
.mat	Matlab MAT file	There's a rule of name of variables. Please see Format of MAT-file .
.mcd	Multi Channel Systems file	Restricted to 32-bit Windows
.nev	Brackrock Microsystems file	Restricted to 32-bit Windows
.nex	Nex Technologies (Neuroexplorer) file	Restricted to 32-bit Windows
.ns*	Brackrock Microsystems file	Restricted to 32-bit Windows
.plx	Plexon file	Restricted to 32-bit Windows
.xls	Microsoft Excel file	There's a rule of format of file. Please see Format of XLS-file .

Restricted to 32-bit Windows

ns_Converter uses DLLs that are available on the web page of Neuroshare Project (http://neuroshare.sourceforge.net/DLLLinks.shtml) to read some of the file formats. These DLLs can only run on 32-bit Windows, so the functions to convert the files that need the DLLs can only run on 32-bit Windows.

The following formats require the 32-bit Windows DLLs:

| ext.	description
.map	Alpha Omega file
.mcd	Multi Channel Systems file
.nev	Brackrock Microsystems file
.nex	Nex Technologies file
.ns*	Brackrock Microsystems file
.plx	Plexon file

How to convert

The following outlines the steps to convert neurophysiological data files into the Neuroshare file format using *ns_Converter*.

Preparation

・ *ns_Converter* needs *ns_CreateFile class library*.
  If you haven't gotten it yet, please download it from
    http://www.cns.atr.jp/dni/download/data-sharing-tool/ ,
  and configure it according to the readme.txt attached with the distribution.

・ Some types of file formats require a 32-bit Windows machine.
  Please see Restricted to 32-bit Windows.

・ Please add the directory containing the unzipped *ns_Converter_[ver].zip* to the Matlab path.

Conversion

1. Enter

   > ns_Converter

   in the Matlab command window and run it.

2. Select the source file from the dialog that you want to convert into the Neuroshare format.
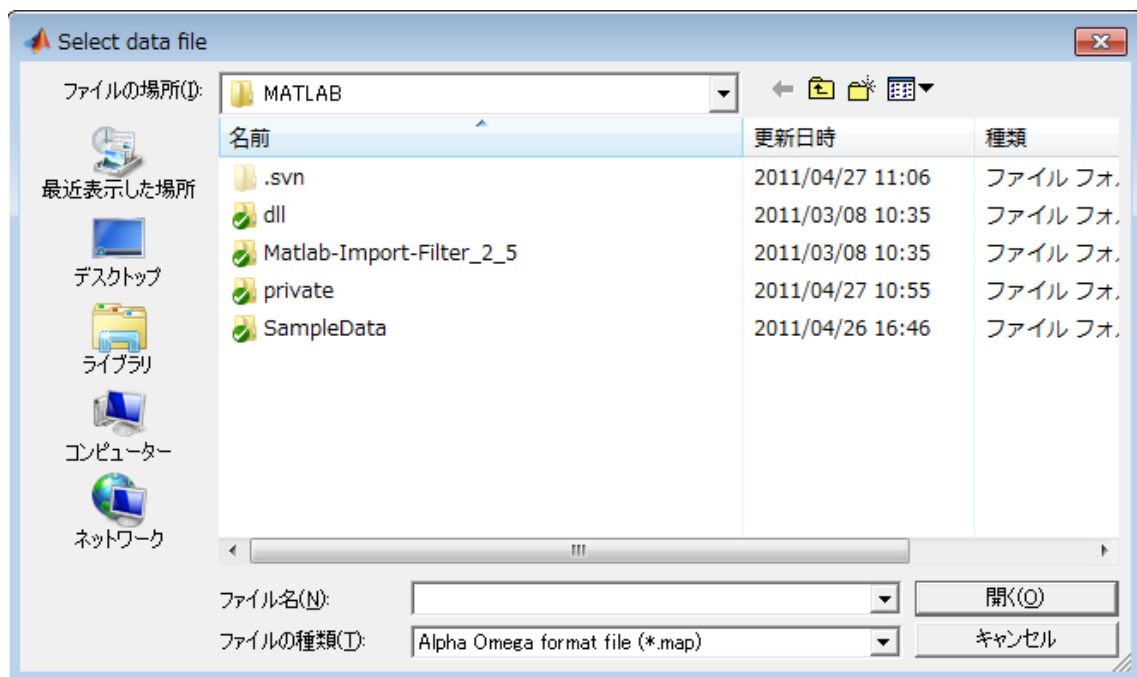
3. A Neuroshare file that has the same file name as the source file only with a ".nsn" extension added to it, will be created in the same directory as the source file.

※ If the directory for *ns_CreateFile* class library hasn't been added to the Matlab path, a dialog will appear to ask you for the location.

Please select the directory for *ns_CreateFile* that was created in the [Preparation step](#).
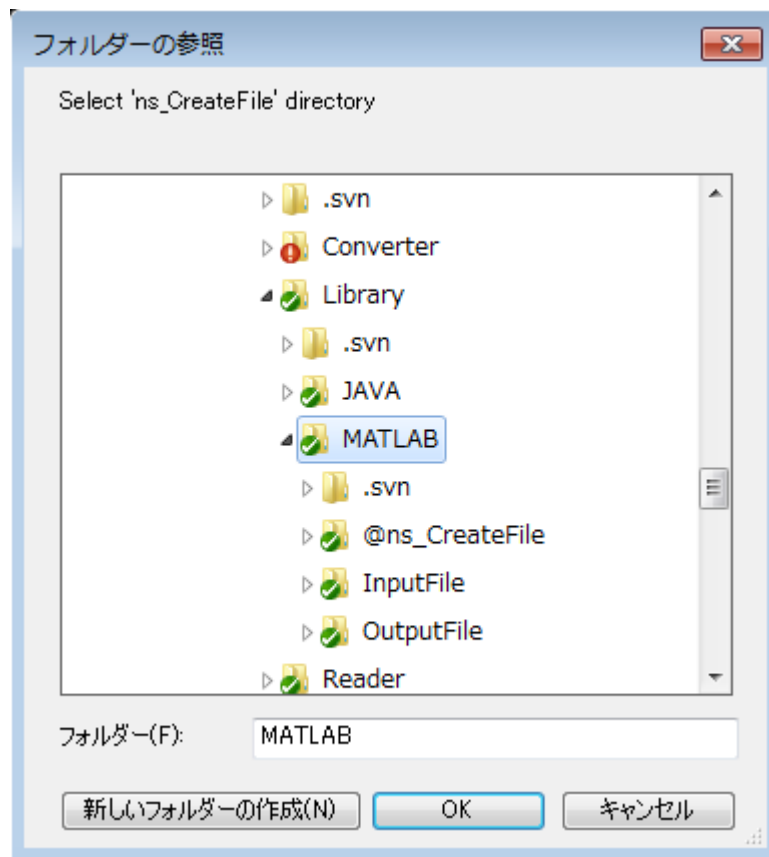
※ You can specify a <u>source file name</u> and an <u>output file name</u> as arguments to *ns_Converter*.

> ns_Converter([source_file], [output_file])

In this case, the dialog to select a source file doesn't appear.

File formats

ns_Converter can convert the following information into a Neuroshare file.

information	format
Date of experiment	String (yyyy/mm/dd HH:MM:SS)
Experiment title	String (less than 32 letters)
Experiment description	String (less than 256 letters)
Data	*later*
Sampling rate	Real number (in Hz) NaN, in case of timestamp data
Channel name	String (less than 32 letters per channel)
Channel description	String (less than 128 letters per channel)

The following types of data can be converted by ns_Converter.

type	description	format
Time-series data	Analog data obtained at a constant sampling rate	Real number (measured value)
Timestamp data	Time information	Real number (elapsed time from the start time in secs)
Event data	Information about events at a specific time	Time: Real number (elapsed time from the start time in secs)
		Event: Whole number of String (don't be allowed to mix within a channel)
Time-series data with ID	Analog data with ID, recorded at the sampling rate	Data: Real number (measured value)
		ID: Whole number

Some formats specify how information should be structured.

Please follow the formatting rules for applicable file types.

Format of MAT-file

MAT-file has to include the information contained in the following variables.

information	variable	format
Date of experiment	file_inf.date	String included in the file_inf structure
	date	String
Experiment title	file_inf.title	String included in the file_inf structure
	title	String
Experiment description	file_inf.explanation	String included in the file_inf structure
	explanation	String
Data	data	[1 x # of channel] matrix of data cells The format of each cell is described below.
Sampling rate	srate	Real-numbered array, [1×# of channel] NaN, in case of timestamp/event data
Channel name	ch_inf(i).name	String included in the ch_inf structure
	ch_name{i}	String
Channel description	ch_inf(i).explanation	String included ch_inf structure
	explanation{i}	String

Data must be contained in the following format.

Data Type	Format
Time-series data	Real-numbered array, [# of samples x 1] (measured values)
Timestamp data	Real-numbered array, [# of samples x 1] (elapsed time [sec] from start)
Event data	[1 x 2] matrix of data cells The 1st row is Elapsed Time [sec]: Real-numbered array, [# of samples x 1] The 2nd row is Event information: Real-numbered array, [# of samples x 1] or Array of string cells, [# of samples x 1]
Time-series data with ID	[1 x 2] matrix of data cells The 1st row is Measured Value: Real-numbered array, [# of samples x 1] The 2nd row is ID: Whole-numbered array, [# of samples x 1]

※ Specify "NaN" for points that have no data

※ Sample files are in the "SampleData" directory (MAT_sample_***.mat)

Format of CSV-file

CSV-file has to keep the following format.

```
1： "Date of experiment"
2： "Experiment title", "Experiment description"
3： "Channel name (ch1)", "Channel name (ch2)", ・・・
4： "Channel desc. (ch1)", "Channel desc. (ch2)", ・・・
5： Sampling rate (ch1), Sampling rate (ch2), ・・・
6： Data (ch1, sample1), Data (ch2, sample1), ・・・
7： Data (ch1, sample2), Data (ch2, sample2), ・・・
         :                    :              :
```

In the case of Event data (a set of Elapsed Times and Events) and Time-series data with ID (a set of Measured Values and IDs), you should add a marker ("#" for Event data, "%" for Time-series data with ID) to the channel name in order to specify that this column is not a different channel, but the same channel as the former column.

Event data

```
                      :
 3： "Ch name (ch1)", "#Ch name (ch1)", "Ch name (ch2)"  ・・・
                      :
 6： Elapsed Time, Event, Data (ch2, sample1), ・・・
          :                 :              :
```

Time-series data with ID

```
                      :
 3： "Ch name (ch1)", "%Ch name (ch1)", "Ch name (ch2)"  ・・・
                      :
 6： Measured Value, ID, Data (ch2, sample1), ・・・
          :               :               :
```

※ Specify "NaN" for points that have no data

※ Sample files are in the "SampleData" directory (CSV_sample_***.csv)

Format of XLS-file

XLS-files have to be in the following format.

The order and the location of data in the XLS-file is not fixed, since you specify where information is placed when the XLS-file is converted.

information	format
Date of experiment	Single cell, [1 x 1]
Experiment title	Single cell, [1 x 1]
Experiment description	Single cell, [1 x 1]
Data	Array of cells, [# of sample x # of channel]
Sampling rate	Array of cells, [1 x # of channel]
Channel name	Array of cells, [1 x # of channel]
Channel description	Array of cells, [1 x # of channel]

In case of Event data (a set of Elapsed Times and Events) and Time-series data with ID (a set of Measured Values and IDs), you should add a marker ("#" for Event data, "%" for Time-series data with ID) to channel name in order to specify that this column is not a different channel, but the same channel as the former column.

Please refer to "Format of CSV-file" for examples.

※ Specify "NaN" for points that have no data

※ Sample files are in the "SampleData" directory (XLS_sample_***.xls)

History

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