

Speech Perception Data-base (SPDB) API Overview

1. create_SPDB.m

Function: This script creates separate SPDBs for all the speech perception experiments, including MN16R, MN64, SNRLoss06 (SL06), SNRLoss07 (SL07), Trunc06 (TR06), Trunc07 (TR07), and HPLPF07 (HL07), by calling the 'pull_Exp-ID_data' functions in the '/exps/' directory, and then integrates the various SPDBs into a single SPDB. In addition, it creates an index file for each sub-database as well as SPDB_Field_Value.mat, which contains all the possible values for a field.

Usage: Just type 'create_SPDB' in Matlab command window.

2. create_SPDB_format.m

Function: This script creates a consistent format file for the SPDBs of the various experiments. However, it is not really used in creating the data-base except for generate a memo of the format of the database.

Usage: Just type 'create_SPDB_format' in Matlab command window.

3. query.m

Function: This script provides a powerful function for you to find whatever data (records) you need from the SPDB or any of its sub-databases given the query conditions. The SPDB consists of 24 fields, as listed in table 1.

Table 1: field name, type and description of SPDB

Field	Keyword	Type	Description
1	exp	string	name of the experiment
2	utter	string	filename of the stimulus
3	talker	string	name of the talker
4	listener	string	name of the listener
5	hearing	string	normal hearing (NH) or hearing impaired (HI)
6	audiogram	string	audiogram.mat; NaN - not available
7	L1	string	first language
8	accent	string	accent of the listener
9	gender	string	gender of the listener
10	age	float	age of the listener
11	stim	string	the presented CV
12	compensate	string	compensated by NAL-R or other prescription formula; NaN - none
13	truncation	float	truncation time
14	frequency	string	name of the frequency band
15	snr	float	signal-to-noise ratio
16	noise	string	noise type, WN - White Noise; SWN - Speech Weighted Noise
17	s_level	float	sound intensity of speech stimuli
18	n_level	float	sound intensity of noise
19	r_level	float	sound intensity of presented stimulus
20	resp	string	listeners response to the stimulus
21	resptime	float	response time
22	repeat	float	number of repeat
23	hit	logical	1 - resp equals to stim; 0 - no;

24	comment	string	Live - live speech in SNRLoss07; HP/LP - filtering condition in HPLPF07
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Usage: data = query(SPDB, 'keyword-1', value-1, 'keyword-2', string-2,);

Example:

```
data = query(SPDB, 'exp', 'HPLPF07', 'utter', 'f103_ba', 'comment', 'HP');
data = query(SPDB, 'exp', 'Trunc07', 'utter', 'm115_ma');
data = query(SPDB_SL07, 'snr', 12, 'hit', 1, 'compensate', 'NaN');
data = query(SPDB_SL07, 'snr', -6, 'compensate', 'NAL-R');
```

4. get_field_value.m

Function: This program is used to retrieve the possible values of a field for a given experiment.

Usage: value_list = get_field_value(exp, fieldname);

Example:

```
utter_list = get_field_value('SL07', 'utter');
resp_list = get_field_value('TR06', 'resp');
```

5. calc_CM.m

Function: This program calculates the Confusion Matrix for a given set of data.

Usage: CM = calc_CM(data, title);

Example:

```
data = query(SPDB_SL07, 'snr', 0, 'compensate', 'NAL-R'); % retrieve data at a given snr
CM = calc_CM(data, 'SNRLoss07-NAL-R'); % calculate confusion matrix
cm2tex(CM.table, ['CM' CM.title '.tex'], CM.stims, CM.resps); % output to Latex document
```

6. cm2tex.m

Function: this program save the Confusion Matrix (CM) in a Latex file.

Usage: cm2tex(mat, tex, lab_row, lab_col)

Example: refer to the previous example.

7. calc_CP.m

Function: This program calculates the Confusion Pattern (CP) for a given utterance.

Usage: CP = calc_CP(data, utter, type); % type = 'time', 'lpf', 'hpf', 'snr';

Example:

```
CP = calc_CP(data, utter, type)
```