

TBT Toolkit Manual

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1. Pre-Requisites-

A. System requirement:-

Any Linux System.

Toolkit is tested on Ubuntu 14.04

B. To build HTS Voice you need to install following tools -

1. Festival – festival-2.4
2. Festvox – festvox-2.7.0
3. HTK – HTK-3.4.1
4. Speech-Tool – speech_tools-2.4
5. SPTK – SPTK-3.9
6. HTS Engine – hts_engine_API-1.10
7. Perl Parallel Fork manager – install this by perl

After installation create below environment variables:

```
$ESTDIR=/path of speechtools/  
$FESTDIR=/path of festival/  
$FESTVOXDIR=/path of festvox/
```

Note1: In file \$FESTVOXDIR/src/unitel/setup_clunits, comment the lines from 79 to 83 to avoid errors.

Note2: Detail steps about installation and environment variable setup is mention in section 6

2 How to use TBT Toolkit-

1. Download TBT Toolkit from link- [//github.com/TTS-cdac-mumbai/TBT-Toolkit](https://github.com/TTS-cdac-mumbai/TBT-Toolkit)
2. Extract the zip file, Now you have TBT toolkit to use-
3. Put the 48KHz wave files in /input/wav_48KHz directory.
4. Put the corresponding text in file named txt.done.data
5. run makefile to build HTS Voice

1. To build the voice in single step, run below command:
make GENDER = "<male/female>" LNG= "<language_name>"

2. To build the voice Step by step (Debugging Mode) run below command one by one
 - A. Phone_level and and Syllable Level Prompt Lab Generation and Syldict Generation
make phone_syllable LNG="<language_name>"
 - B. Silence detection-insertion and down-sampling of waves
make wave_processing
 - C. Wave to raw conversion
make wav2raw
 - D. f0 calculation to find minimum and maximum pitch value
make f0_calculation GENDER="<male/female>"
 - E. Hybrid segmentation
make hybrid_segmentation GENDER="<male/female>"
LNG="<language_name>"
 - F. Phone-level utterance file generation
make utt_generation LNG="<language_name>"
 - G. HTS Voice building
make build_htsvoice LNG="<language_name>"
 - H. HTS Voice testing
make test_htsvoice LNG="<language_name>"

3. Directory Structure

1. INPUT
 - 1.1 wav files in /wav folder
 - 1.2 txt.done.data
2. OUTPUT
Generated Output .htsoice file
3. Resources
 - 3.1. COMMON
 - 3.1.1 phoneme
 - 3.1.2 syllable
 - 3.1.3 Hybrid_seg
 - 3.1.4 htsvoice
 - 3.1.5 parser
 - 3.2. LANGUAGES
 - 3.2.1 MARATHI
 - 3.2.1.1 phoneme
 - 3.2.1.2 syllable
 - 3.2.1.3 Hybrid_seg
 - 3.2.1.4 htsvoice
 - 3.2.1.5 htsvoice_synthesis.tar.bz2
4. SCRIPTS
Contains all required main scripts.
5. TEMP

5.1 phoneme

5.2 syllable

5.3 Hybrid_seg

5.4 htsvoice

The generated output by the respective task is stored into its corresponding directory.

6. MAKEFILE

4. Format of txt.done.data

(SENTENCE NUMBER " TEXT...")

eg.

(text0700 " मला वाटलं, की पाणी माझ्या हाता खाली, श्वास घेत होते. ")

(text0701 " मी माझे डोळे, घट्ट बंद केले. ")

5. Package installation

1. speech tool

Extract speechtool

\$tar -xvzf speechtool<version>.tar.gz

Go to speechtool directory

\$cd speechtool

Run the following commands:-

\$/configure

\$make info

\$make

If you run these commands successfully then speechtool is installed in your system.

After installing speechtool create a environment variable as given:

\$export ESTDIR=`pwd`

eg. ESTDIR= path/to/speechtool/installed

Then go to the parent directory by

\$cd ..

2. Festival

Extract festival

\$tar -xvzf festival<version>.tar.gz

Go to festival directory

\$cd festival

Run the following commands:-

\$/configure

\$make info

\$make

If you run these commands successfully then festival is installed in your system.

After installing festival create a environment variable as given:

\$export FESTDIR=`pwd`

e.g. FESTDIR= path/to/festival/installed

Then go to the parent directory by

\$cd ..

Then you have to add voices to let festival speak for you. For that you have to extract the following files:- festlex.CMU.tar.gz , festlex.POSLEX.tar.gz and festvox.kallpcl6k.tar.gz by running the following commands

\$tar -xvzf festlex_CMU.tar.gz

\$tar -xvzf festlex_POSLEX.tar.gz

\$tar -xvzf festvox_kallpcl6k.tar.gz

Check whether festival install properly or not by running this command:-

\$festival/bin/festival

The festival prompt will appear like this

\$festival>

\$festival>(SayText "Hello World")

You should listen Hello World.

If some error regarding dsp just check whether other applications are using dsp. Close that application and again run SayText...

Then create a symbolic link with festival to /usr/bin/festival by this command:-

\$sudo ln -s /home/kousik/festival/bin/festival /usr/bin/festival

4. Festvox

Extract Festvox

\$tar -xvzf festvox<version>.tar.gz

Go to festvox directory

\$cd festvox

Run the following commands:-

```
$/configure
$make info
$make
```

If you run these commands successfully then festvox is installed in your system.

After installing festvox create a environment variable as given:

```
$export FESTVOXDIR=`pwd`
    e.g. FESTVOXDIR= path/to/festvox/installed
Then go to the parent directory by
$cd ..
```

Once you install all three tools into your system add all the path of the tools to environment variable by adding path to ~/.bash_profile or /etc/bash.bashrc file like this:-

```
export ESTDIR=<path_of_the_speech_tool>
export FESTDIR=<path_of_the_festival>
export FESTVOXDIR=<path_of_the_festvox>
```

e.g.:

```
export ESTDIR=/home/tts/tts/speech_tools
export FESTDIR=/home/tts/tts/festival
export FESTVOXDIR=/home/tts/tts/festvox
```

Then save and close the file.

To reflect the changes run the following commands:-

```
$source ~/.bash_profile
or
source /etc/bash.bashrc
```

4.Installing HMM-toolkit (HTK)

```
tar xvfz ../files_for_synthesis/HTK-3.4.1.tar.gz
cd htk
cp ../../files_for_synthesis/HTS-2.2_for_HTK-3.4.1.tar.bz2/ .
tar -xjf HTS-2.2_for_HTK-3.4.1.tar.bz2
cd ..
tar xvfz ../files_for_synthesis/Hdecode-3.4.1.tar.gz
```

```
cd htk
```

Perform the following step to include a patch file for HTS.

```
patch -p1 -d . < HTS-2.2_for_HTK-3.4.1.patch
```

Set up HTK as follows. The executables, such as HCopy, HList, HInit, etc., will be compiled in
/usr/local/HTS-2.2beta/bin.

```
./configure
```

```
make
```

```
sudo make install
```

```
sudo make hlmttools install-hlmttools
```

```
sudo make hdecode install-hdecode
```

6. Installing HTS Engine

```
cd ..
```

```
tar xvfz ../files_for_synthesis/hts_engine_API-1.06.tar.gz
```

```
cd hts_engine_API-1.06
```

```
./configure
```

```
make
```

```
sudo make install
```

7. Installing SPTK

```
cd ..
```

```
tar xvfz ../files_for_synthesis/SPTK-3.5.tar.gz
```

```
cd SPTK
```

```
./configure
```

```
make
```

```
sudo make install
```

6. Trouble Shooting

Error:-

```
/usr/bin/ld: cannot find -lcurses
```

Solution:-

```
sudo ln -s /lib/libncurses.so.5 /lib/libcurses.so
```

Error:-

```
/usr/bin/ld: cannot find -lnurses
```

Solution:-

```
apt-get install libncurses5-dev
```

Error:-

```
/usr/bin/ld: cannot find -lstdc++
```

Solution:-

```
sudo ln -s /usr/lib/libstdc++.so.6 /lib/libstdc++.so
```

Error:-

```
gcc: error trying to exec 'cc1plus': execvp: No such file or directory
```

Solution:-

```
sudo apt-get install g++
```

Error:-

```
ln -s festival/bin/festival /usr/bin/festival  
ln: accessing `/usr/bin/festival': Too many levels of symbolic links
```

Solution:-

```
sudo mv /usr/bin/festival /usr/bin/festival.orig  
ln -s /home/boss/festival/festival/src/main/festival /usr/bin/festival  
ln: creating symbolic link `/usr/bin/festival' to `/home/boss/festival/festival/
```

Error: Error in /usr/local/bin/raw2wav -s 48 -d

Solution:

Go to HTS-demo_CMU-ARCTIC-SLT/scripts/config.pm, at line number 253, replace
‘/usr/local/bin/raw2wav’ by ‘/usr/local/bin/raw2towav’