# TBT Toolkit Manual

**Version1.0, April 2017**

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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 Paralllel 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/unitsel/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
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
    - 3.2. 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
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 extarct 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 weathere 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 wheathere 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 festvoxl<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 hlmtools install-hlmtools
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 -lncurses
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’