Tegaki Project: Open-Source Chinese Handwriting Recognition (Presentation for Open Source Developer Meetup #1 organized by Open Source Hong Kong)

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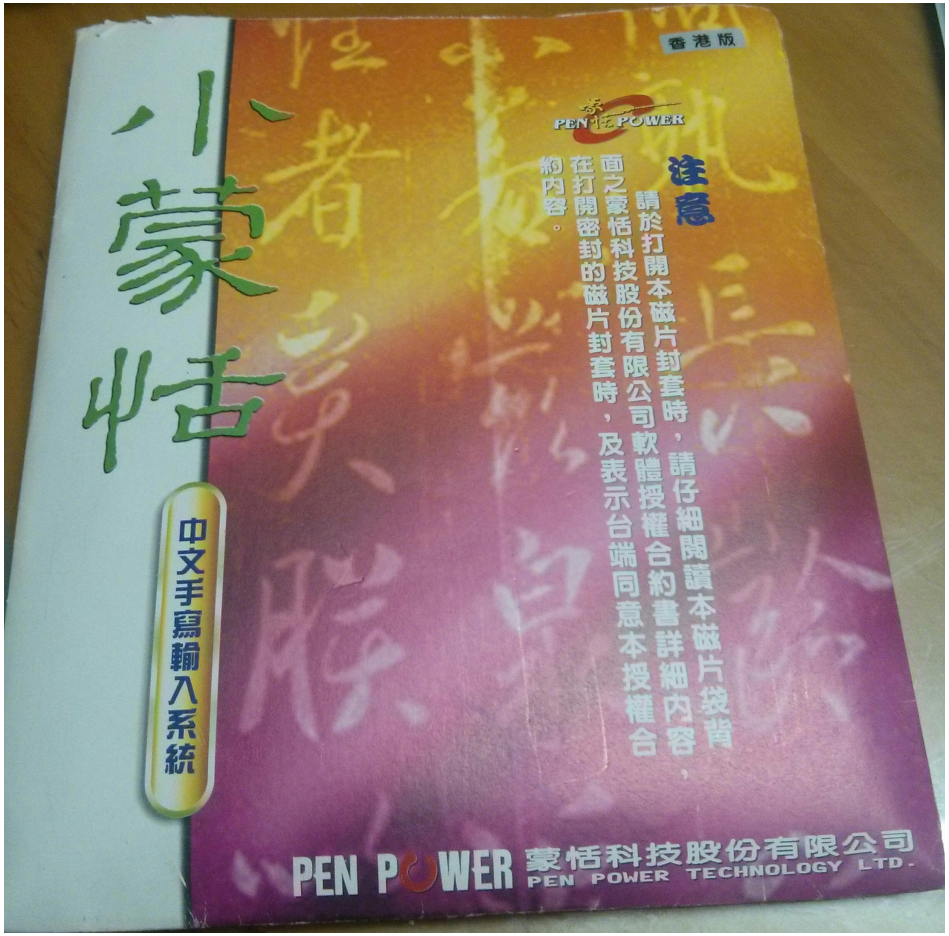
Self introduction

- MPhil in Economics, Year 1 student @ CUHK
- Like programming and the concept of open source
- Part-time teaching assistant
- Assisted teaching of Python for UG students majoring in Economics @ CUHK

Discovery of Tegaki Project I

When I am young, I used 小蒙括 in Windows to type Chinese

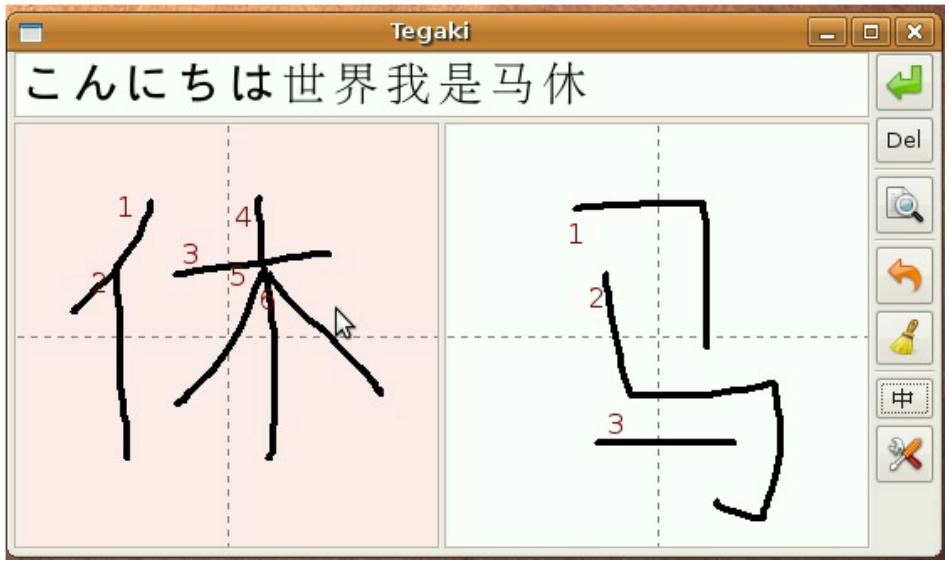


Discovery of Tegaki Project II

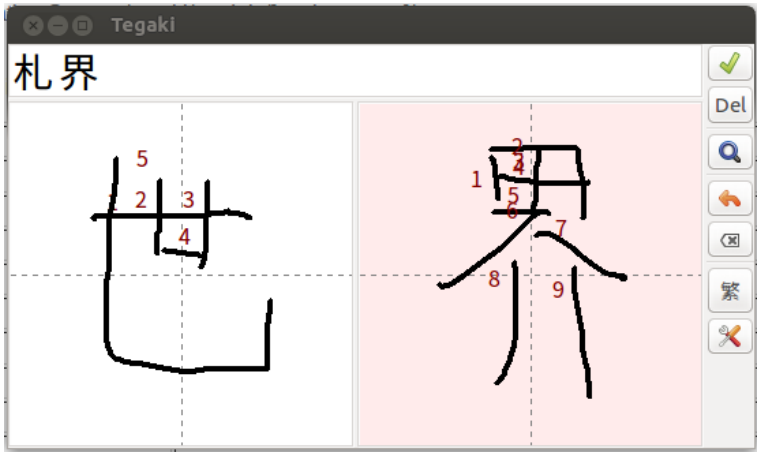
- Under Linux, I mostly use ibus-table-cangjie3 to type Chinese
- But, sometimes, I do not know how to type some Chinese characters in cangjie3
- Only when I can connect to the Internet, I can use http://hanzi.unihan.com.cn/Qpen instead

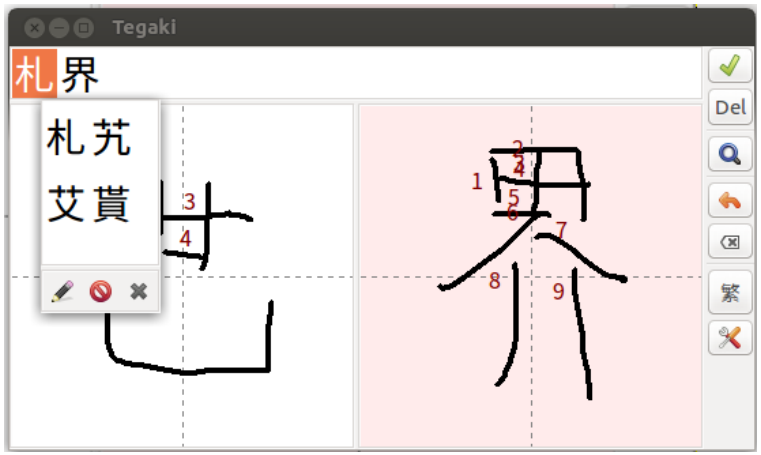
Discovery of Tegaki Project III

- Local Chinese handwriting input under Linux? Tegaki [1]:
  - is free and open-source
  - is multi-plaform
  - focuses on Chinese (simplified and traditional) and Japanese characters
  - supports 2 different recognition engines (zinnia and wagomu)
  - aspires to work on both desktop-PCs and mobile devices

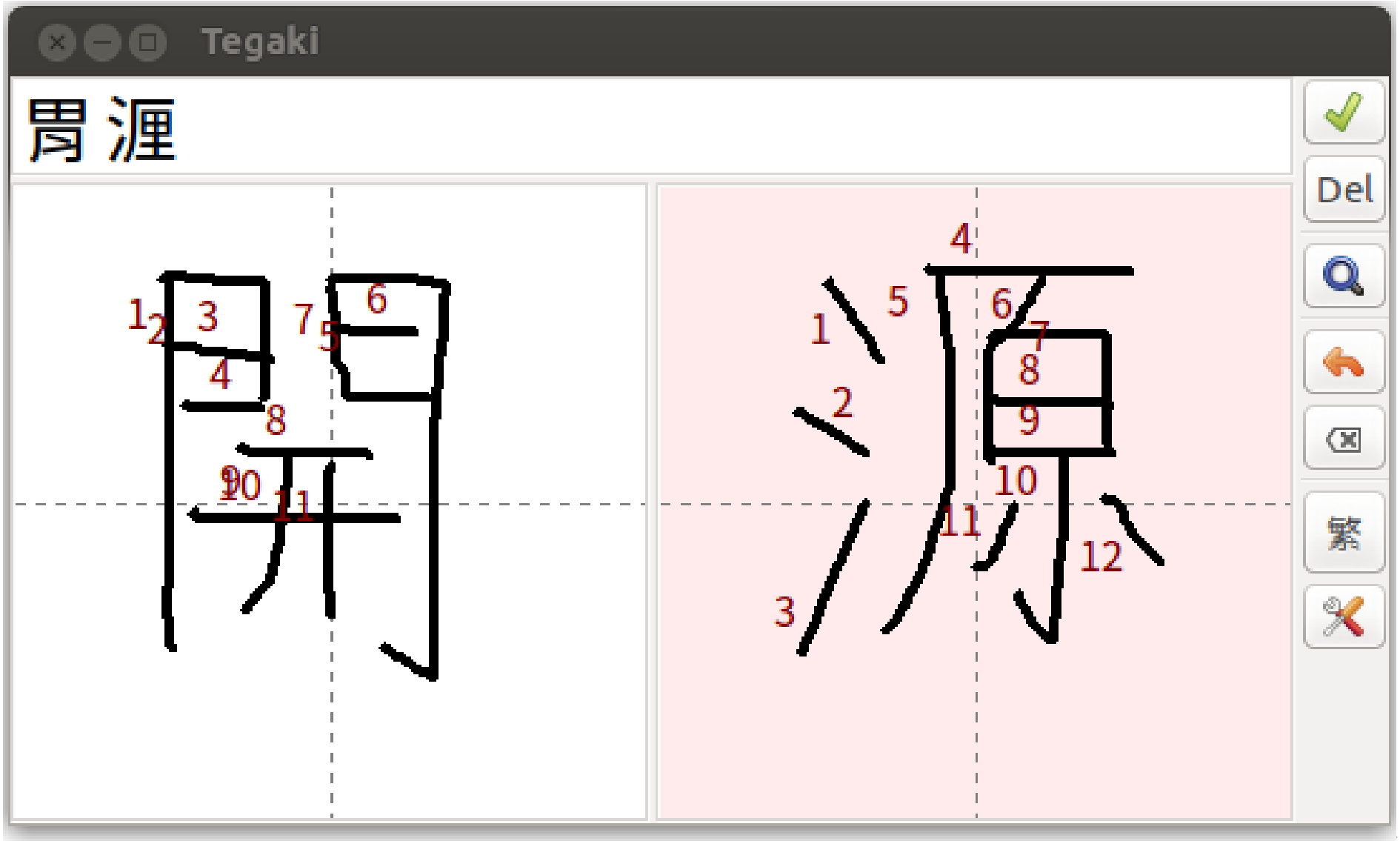


Problem: Bad Chinese (traditional) handwriting recognition I

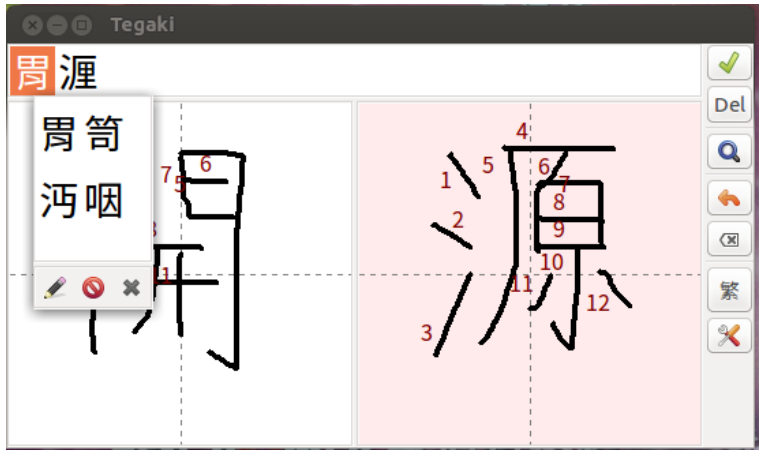


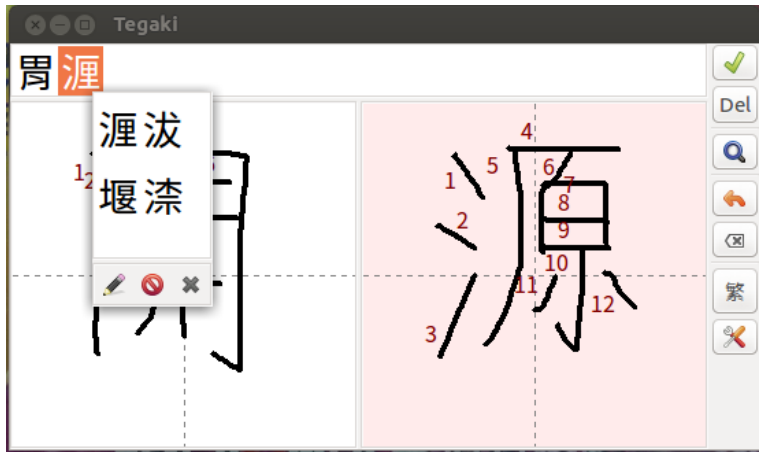


Problem: Bad Chinese (traditional) handwriting recognition II



Problem: Bad Chinese (traditional) handwriting recognition III



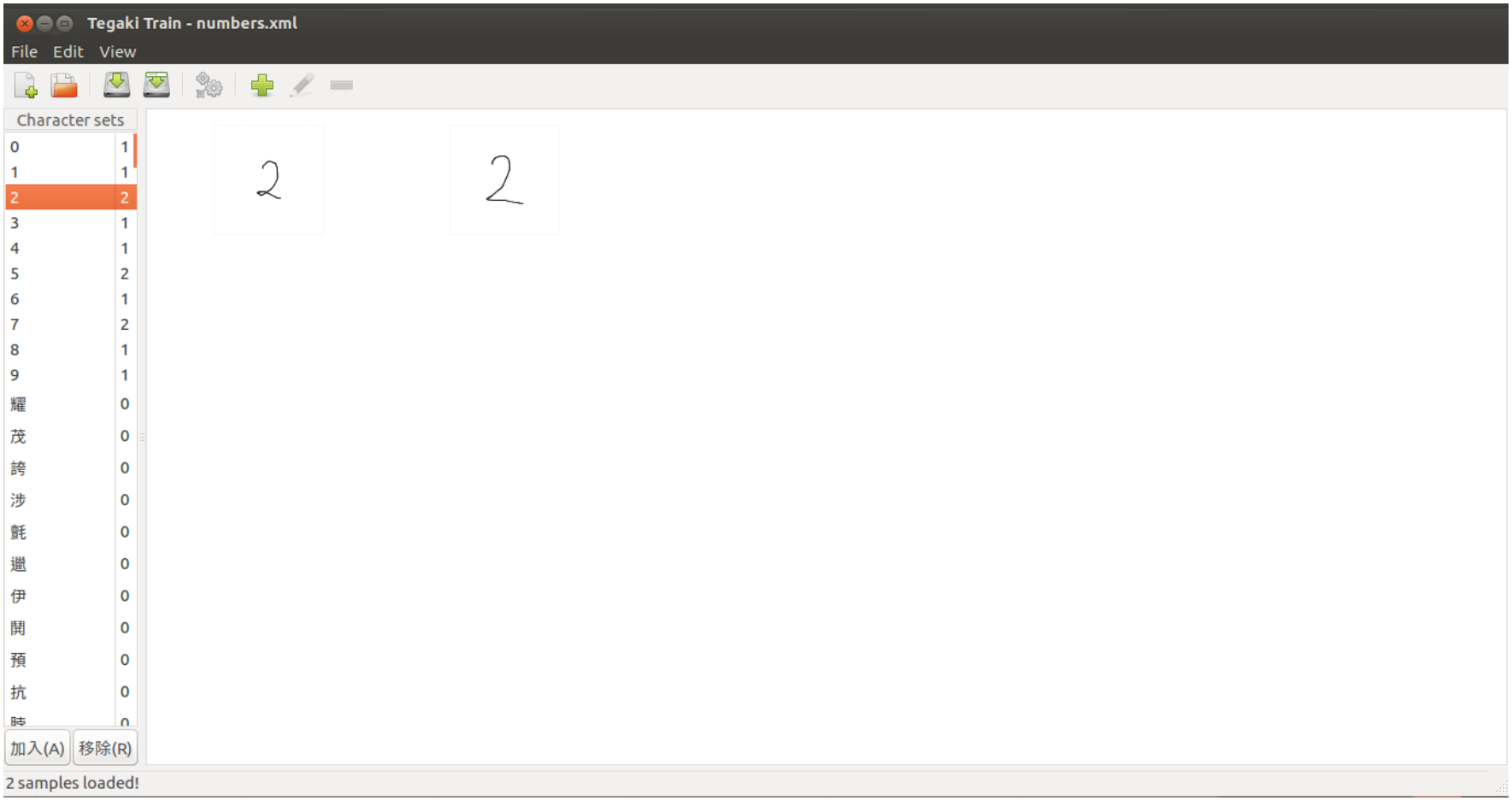


Solution: Bad Chinese (traditional) handwriting recognition I

- Traditional Chinese model (Zinnia engine) available at https://github.com/tegaki/tegaki/releases/download/v0.3/tegaki-zinnia-traditional-chinese-0.3.zip is used
- The model seems to use rare Chinese characters for training
- Why don't we as local Chinese train our own model?

Solution: Bad Chinese (traditional) handwriting recognition II

- In Tegaki Project, there is tegaki-train, allowing us to create our own model



Solution: What I have done

- Create model for Arabic numerals as a test
- Scrap common Chinese (traditional) characters from Chinese Character Frequency Statistics for Hong Kong, Mainland China and Taiwan at http://humanum.arts.cuhk.edu.hk/Lexis/chifreq/
- Combine these characters into one UTF-8 file for importing into tegaki-train

Another problem: I am doing it wrongly or tegaki-train is buggy

After I have imported these common characters into the program, I get the error:

```
Traceback (most recent call last):
  File "./tegaki-train", line 654, in _on_open
    charcol = dialog.get_character_collection()
  File "./tegaki-train", line 572, in get_character_collection
    open_character_collection(self.get_filename ())
  File "./tegaki-train", line 577, in open_character_collection
    return CharacterCollection(filename)
  File "/usr/lib/python2.7/dist-packages/tegaki/charcol.py", line 347, in __init__
    self.read(path, gzip=gzip, bz2=bz2)
  File "/usr/lib/python2.7/dist-packages/tegaki/character.py", line 996, in read
    parser.ParseFile(file)
  File "/usr/lib/python2.7/dist-packages/tegaki/charcol.py", line 1026, in _start_element
    self.add_set(self._curr_set_name)
  File "/usr/lib/python2.7/dist-packages/tegaki/charcol.py", line 596, in add_set
    self.add_sets([set_name])
  File "/usr/lib/python2.7/dist-packages/tegaki/charcol.py", line 606, in add_sets
    self._em("INSERT INTO character_sets(name) VALUES (?)", set_names)
  File "/usr/lib/python2.7/dist-packages/tegaki/charcol.py", line 365, in _em
    return self._c.executemany(req, *a, **kw)
sqlite3.ProgrammingError: You must not use 8-bit bytestrings unless you use a text_factory that can interpret
8-bit bytestrings (like text_factory = str). It is highly recommended that you instead just switch your
application to Unicode strings.
```

Another problem: I am doing it wrongly or tegaki-train is buggy

After I have provided sample for a Chinese character, I get the error:

```
Traceback (most recent call last):
  File "./tegaki-train", line 851, in _on_add_sample_done
    self._charcol.append_character(charset, character)
  File "/usr/lib/python2.7/dist-packages/tegaki/charcol.py", line 778, in append_character
    self.append_characters(set_name, [character])
  File "/usr/lib/python2.7/dist-packages/tegaki/charcol.py", line 786, in append_characters
    self.append_character_rows(set_name, rows)
  File "/usr/lib/python2.7/dist-packages/tegaki/charcol.py", line 795, in append_character_rows
    VALUES (?,?,?,?,?)""", tupls)
  File "/usr/lib/python2.7/dist-packages/tegaki/charcol.py", line 365, in _em
    return self._c.executemany(req, *a, **kw)
sqlite3.ProgrammingError: You must not use 8-bit bytestrings unless you use a text_factory that can interpret
8-bit bytestrings (like text_factory = str). It is highly recommended that you instead just switch your
application to Unicode strings.
```

My plan

- Try to resolve my problem or tegaki-train's problem with some of you if possible
- Start to train our own Chinese (traditional) model using tegaki-train with the help of Hong Kong people and Taiwanese interested in this project

Joining this project

- You can obtain tegaki-train by:
  - git clone https://github.com/tegaki/tegaki.git
  - Move to the folder "tegaki-train", where the source code locates
  - To install tegaki-train: sudo python setup.py install
  - To open tegaki-train: ./bin/tegaki-train
- My project is at https://github.com/chrischeungnf/tegaki-zinnia-traditional-chinese-local

Reference

Tegaki Project

Tegaki - Open-Source Chinese and Japanese Handwriting Recognition

Retrieved from: https://tegaki.github.io/