Under The Sea Documentation

Release 1.1.9

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Vietnamese NLP Toolkit

CHAPTER 1

Underthesea - Vietnamese NLP Toolkit

underthesea is a suite of open source Python modules, data sets and tutorials supporting research and development in Vietnamese Natural Language Processing.

Version 1.3.0 out now! Underthesea meet deep learning!

Free software	GNU General Public License v3
Live demo	undertheseanlp.com
Colab notebooks	latest / stable
Documentation	Underthesea Documentation
Facebook	Underthesea Page
Youtube	Underthesea NLP Channel

1.1 Installation

To install underthesea, simply:

```
$ pip install underthesea
```

Satisfaction, guaranteed.

1.2 Usage

- *1. Sentence Segmentation*
- *2. Word Segmentation*
- *3. POS Tagging*
- *4. Chunking*
- *5. Dependency Parsing*
- *6. Named Entity Recognition*
- *7. Text Classification*
- *8. Sentiment Analysis*
- *9. Vietnamese NLP Resources*

1.2.1 1. Sentence Segmentation

Usage

```
>>> # -*- coding: utf-8 -*-
>>> from underthesea import sent_tokenize
>>> text = 'Taylor cho bit lúc đu cô cm thy ngi vi cô bn thân Amanda nhng ri mi th␣
↪trôi qua nhanh chóng. Amanda cũng thoi mái vi mi quan h này.'

>>> sent_tokenize(text)
[
    "Taylor cho bit lúc đu cô cm thy ngi vi cô bn thân Amanda nhng ri mi th trôi qua␣
↪nhanh chóng.",
    "Amanda cũng thoi mái vi mi quan h này."
]
```

1.2.2 2. Word Segmentation

Usage

```
>>> # -*- coding: utf-8 -*-
>>> from underthesea import word_tokenize
>>> sentence = 'Chàng trai 9X Qung Tr khi nghip t nm sò'

>>> word_tokenize(sentence)
['Chàng trai', '9X', 'Qung Tr', 'khi nghip', 't', 'nm', 'sò']

>>> word_tokenize(sentence, format="text")
'Chàng_trai 9X Qung_Tr khi_nghip t nm sò'
```

1.2.3 3. POS Tagging

Usage

```
>>> # -*- coding: utf-8 -*-
>>> from underthesea import pos_tag
>>> pos_tag('Ch tht chó ni ting  Sài Gòn b truy quét')
[('Ch', 'N'),
 ('tht', 'N'),
 ('chó', 'N'),
 ('ni ting', 'A'),
 ('', 'E'),
 ('Sài Gòn', 'Np'),
 ('b', 'V'),
 ('truy quét', 'V')]
```

1.2.4 4. Chunking

Usage

```
>>> # -*- coding: utf-8 -*-
>>> from underthesea import chunk
>>> text = 'Bác sĩ bây gi có th thn nhiên báo tin bnh nhân b ung th?'
>>> chunk(text)
[('Bác sĩ', 'N', 'B-NP'),
 ('bây gi', 'P', 'I-NP'),
 ('có th', 'R', 'B-VP'),
 ('thn nhiên', 'V', 'I-VP'),
 ('báo tin', 'N', 'B-NP'),
 ('bnh nhân', 'N', 'I-NP'),
 ('b', 'V', 'B-VP'),
 ('ung th', 'N', 'I-VP'),
 ('?', 'CH', 'O')]
```

1.2.5 5. Dependency Parsing

Usage

```
>>> # -*- coding: utf-8 -*-
>>> from underthesea import dependency_parse
>>> text = 'Ti 29/11, Vit Nam thêm 2 ca mc Covid-19'
>>> dependency_parse(text)
[('Ti', 5, 'obl:tmod'),
 ('29/11', 1, 'flat:date'),
 (',', 1, 'punct'),
 ('Vit Nam', 5, 'nsubj'),
 ('thêm', 0, 'root'),
 ('2', 7, 'nummod'),
 ('ca', 5, 'obj'),
 ('mc', 7, 'nmod'),
 ('Covid-19', 8, 'nummod')]
```

1.2.6 6. Named Entity Recognition

Usage

```
>>> # -*- coding: utf-8 -*-
>>> from underthesea import ner
>>> text = 'Cha tit l lch trình ti Vit Nam ca Tng thng M Donald Trump'
>>> ner(text)
[('Cha', 'R', 'O', 'O'),
 ('tit l', 'V', 'B-VP', 'O'),
 ('lch trình', 'V', 'B-VP', 'O'),
 ('ti', 'E', 'B-PP', 'O'),
 ('Vit Nam', 'Np', 'B-NP', 'B-LOC'),
 ('ca', 'E', 'B-PP', 'O'),
 ('Tng thng', 'N', 'B-NP', 'O'),
 ('M', 'Np', 'B-NP', 'B-LOC'),
 ('Donald', 'Np', 'B-NP', 'B-PER'),
 ('Trump', 'Np', 'B-NP', 'I-PER')]
```

1.2.7 7. Text Classification

Download models

```
$ underthesea download-model TC_GENERAL
$ underthesea download-model TC_BANK
```

Usage

```
>>> # -*- coding: utf-8 -*-
>>> from underthesea import classify

>>> classify('HLV đu tiên  Premier League b sa thi sau 4 vòng đu')
['The thao']
>>> classify('Hi đng t vn kinh doanh Asean vinh danh gii thng quc t')
['Kinh doanh']

>> classify('Lãi sut t BIDV rt u đãi', domain='bank')
['INTEREST_RATE']
```

1.2.8 8. Sentiment Analysis

Download models

```
$ underthesea download-model SA_GENERAL
$ underthesea download-model SA_BANK
```

Usage

```
>>> # -*- coding: utf-8 -*-
>>> from underthesea import sentiment

>>> sentiment('hàng kém cht lg,chăn đp lên dính lông lá khp ngi. tht vng')
negative
>>> sentiment('Sn phm hi nh so vi tng tng nhng cht lng tt, đóng gói cn thn.')
positive

>>> sentiment('Đky qua đng link  bài vit này t th 6 mà gi cha thy ai lhe ht', domain=
↪'bank')
['CUSTOMER_SUPPORT#negative']
>>> sentiment('Xem li vn thy xúc đng và t hào v BIDV ca mình', domain='bank')
['TRADEMARK#positive']
```

1.2.9 9. Vietnamese NLP Resources

List resources

```
$ underthesea list-data
| Name          | Type         | License    |   Year | Directory              |
|---------------+--------------+------------+--------+------------------------|
| UTS2017-BANK  | Categorized  | Open       |   2017 | datasets/UTS2017-BANK  |
| VNESES        | Plaintext    | Open       |   2012 | datasets/LTA           |
| VNTQ_BIG      | Plaintext    | Open       |   2012 | datasets/LTA           |
| VNTQ_SMALL    | Plaintext    | Open       |   2012 | datasets/LTA           |
| VNTC          | Categorized  | Open       |   2007 | datasets/VNTC          |

$ underthesea list-data --all
```

Download resources

```
$ underthesea download-data VNTC
100%|| 74846806/74846806 [00:09<00:00, 8243779.16B/s]
Resource VNTC is downloaded in ~/.underthesea/datasets/VNTC folder
```

1.3 Up Coming Features

- Machine Translation
- Text to Speech
- Automatic Speech Recognition

1.4 Contributing

Do you want to contribute with underthesea development? Great! Please read more details at CONTRIBUTING.rst.

CHAPTER 2

AUTHORS

2.1 Original Authors

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2.2 Awesome Contributors

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2.3 Thanks

Thanks to all the wonderful folks who have contributed to schedule over the years

- Nhu Bao Vu <nhubaovu@gmail.com>
- Hoai-Thu Vuong <thuvh87@gmail.com>

CHAPTER 3

History

3.1 1.3.0 (2020-12-11)

- Remove languageflow dependency (GH-364)
- Remove tabulate dependency (GH-364)
- Remove scores in text classification and sentiment section (GH-351)
- Add information of dependency_parse module in info function (GH-351)
- Try to use Github Actions (GH-353)
- Dependency Parsing (GH-157)

3.2 1.2.3 (2020-11-28)

- Refactor config for resources (GH-300)
- Thêm API x lý d liu (GH-299)

3.3 1.2.2 (2020-11-04)

- Remove nltk strict version (GH-308)
- Add word_hyphen rule (GH-290)
- Sanity check python version (GH-320)
- Handle exception case in sentiment module (GH-321)
- Cp nht qun lý resources t languageflow (GH-295)
- Loi b languageflow trong quá trình cài đt (GH-295)

- Cp nht phiên bn fasttext (GH-304)

3.4 1.1.16 (2019-06-15)

- Bumping up version of the languageflow dependency (GH-231)
- Update phiên bn scikit-learn 0.20.2 (GH-229)
- Cp nht li các dependencies (GH-241)
- Cp nht mô hình trên b d liu VNTC (GH-246)
- Cp nht mô hình trên b d liu UTS2017_BANK_TC (GH-243)
- Cp nht mô hình trên b d liu UTS2017_BANK_SA (GH-244)
- Li vi các câu sentiment demo (GH-236)
- Thng nht cách đt tên và qun lý model (GH-225)

3.5 1.1.12 (2019-03-13)

- Add sentence segmentation feature

3.6 1.1.9 (2019-01-01)

- Improve speed of word_tokenize function
- Only support python 3.6+
- Use flake8 for style guide enforcement

3.7 1.1.8 (2018-06-20)

- Fix word_tokenize error when text contains tab (t) character
- Fix regex_tokenize with url

3.8 1.1.7 (2018-04-12)

- Rename word_sent function to word_tokenize
- Refactor version control in setup.py file and __init__.py file
- Update documentation badge url

3.9 1.1.6 (2017-12-26)

- New feature: aspect sentiment analysis
- Integrate with languageflow 1.1.6
- Fix bug tokenize string with '=' (#159)

3.10 1.1.5 (2017-10-12)

- New feature: named entity recognition
- Refactor and update model for word_sent, pos_tag, chunking

3.11 1.1.4 (2017-09-12)

- New feature: text classification
- [bug] Fix Text error
- [doc] Add facebook link

3.12 1.1.3 (2017-08-30)

- Add live demo: https://underthesea.herokuapp.com/

3.13 1.1.2 (2017-08-22)

- Add dictionary

3.14 1.1.1 (2017-07-05)

- Support Python 3
- Refactor feature_engineering code

3.15 1.1.0 (2017-05-30)

- Add chunking feature
- Add pos_tag feature
- Add word_sent feature, fix performance
- Add Corpus class
- Add Transformer classes
- Integrated with dictionary of Ho Ngoc Duc

- Add travis-CI, auto build with PyPI

3.16 1.0.0 (2017-03-01)

- First release on PyPI.
- First release on Readthedocs

CHAPTER 4

word_tokenize

CHAPTER 5

pos_tag

CHAPTER 6

chunking

CHAPTER 7

ner

CHAPTER 8

classify

Install dependencies and download default model

```
$ pip install Cython
$ pip install future scipy numpy scikit-learn
$ pip install -U fasttext --no-cache-dir --no-deps --force-reinstall
$ underthesea data
```

CHAPTER 9

sentiment

Install dependencies

```
$ pip install future scipy numpy scikit-learn==0.19.2 joblib
```

CHAPTER 10

Indices and tables

- genindex
- modindex
- search