Introduction to Language Identification Tools

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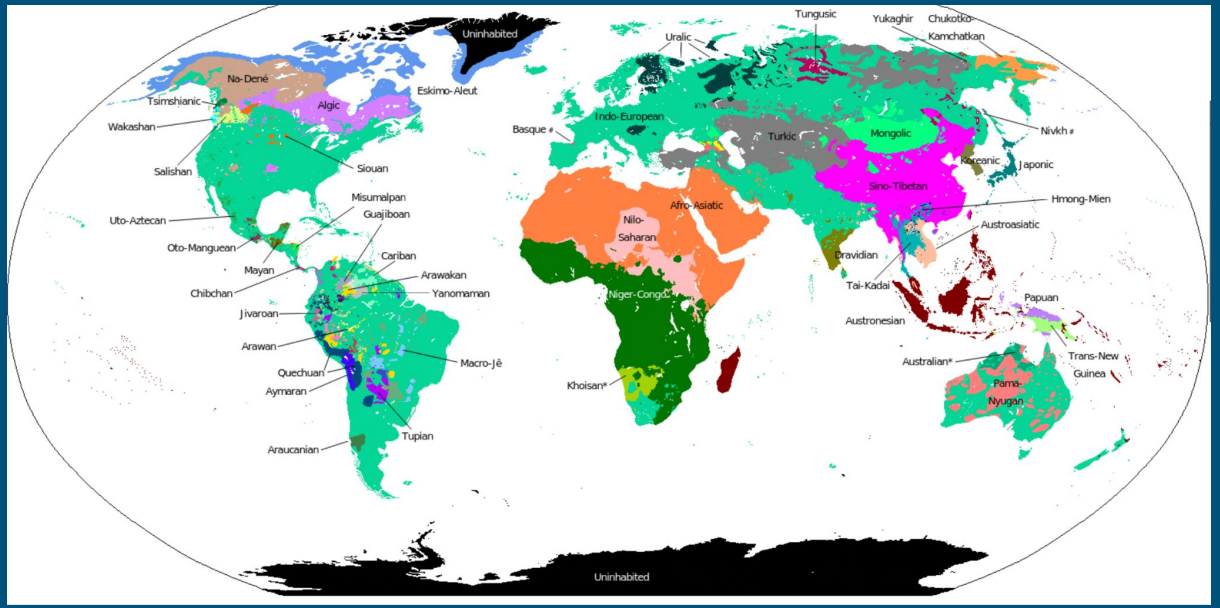
Language Identification

A task to determine the language that a piece of text is written in (Jauhiainen et al. 2018)



Source: https://en.wikipedia.org/wiki/List_of_language_families

What are these languages?

How are you?

English

Comment ça va ?

French

¿Cómo estás?

Spanish

Source: https://unsplash.com/photos/mountain-and-houses-58uZCE8zrdk

What are these languages?

こんにちは

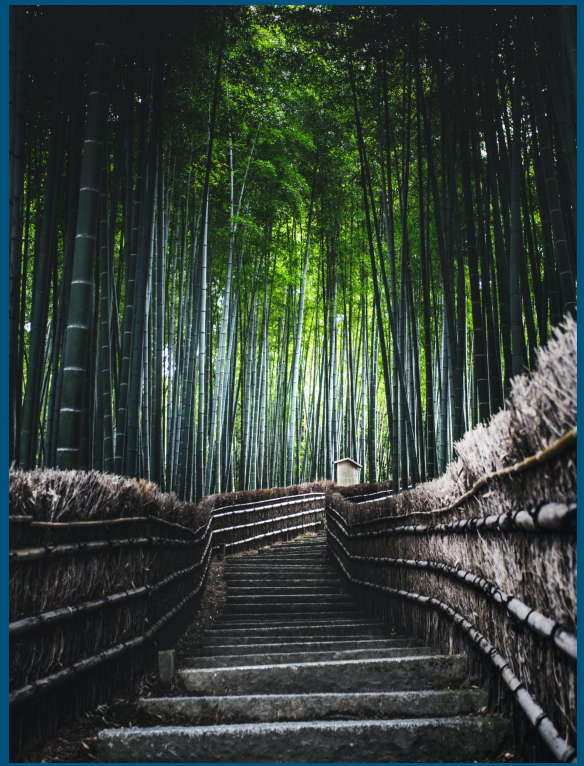
Japanese

你好

Chinese

안녕하세요

Korean



Source: https://unsplash.com/photos/brown-wooden-bridge-in-the-woods-0n9bZtFejiQ

What are these languages?

Ngiyajabula ukuthi kunabantu abazimisele ukungisekela.

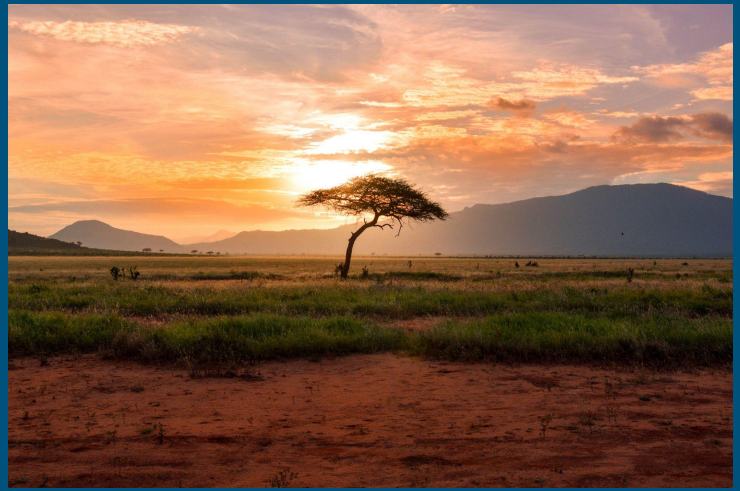
Zulu

Ndiyavuya kukho abantu abafuna ukundixhasa.

Xhosa

Inu mi dun pe awon eyan wa to fe durotimi.

Yoruba



Source: https://unsplash.com/photos/tree-between-green-land-during-golden-hour-T-LfvX-7IVg

Potential Applications to Archival Science

Automatic classification of a text by language

Identifying languages at sentence-level

Automatic creation of metadata

Language Identification Tools

Dataset

Babel-670

670 languages

Source: https://en.wikipedia.org/wiki/Tower_of_Babel

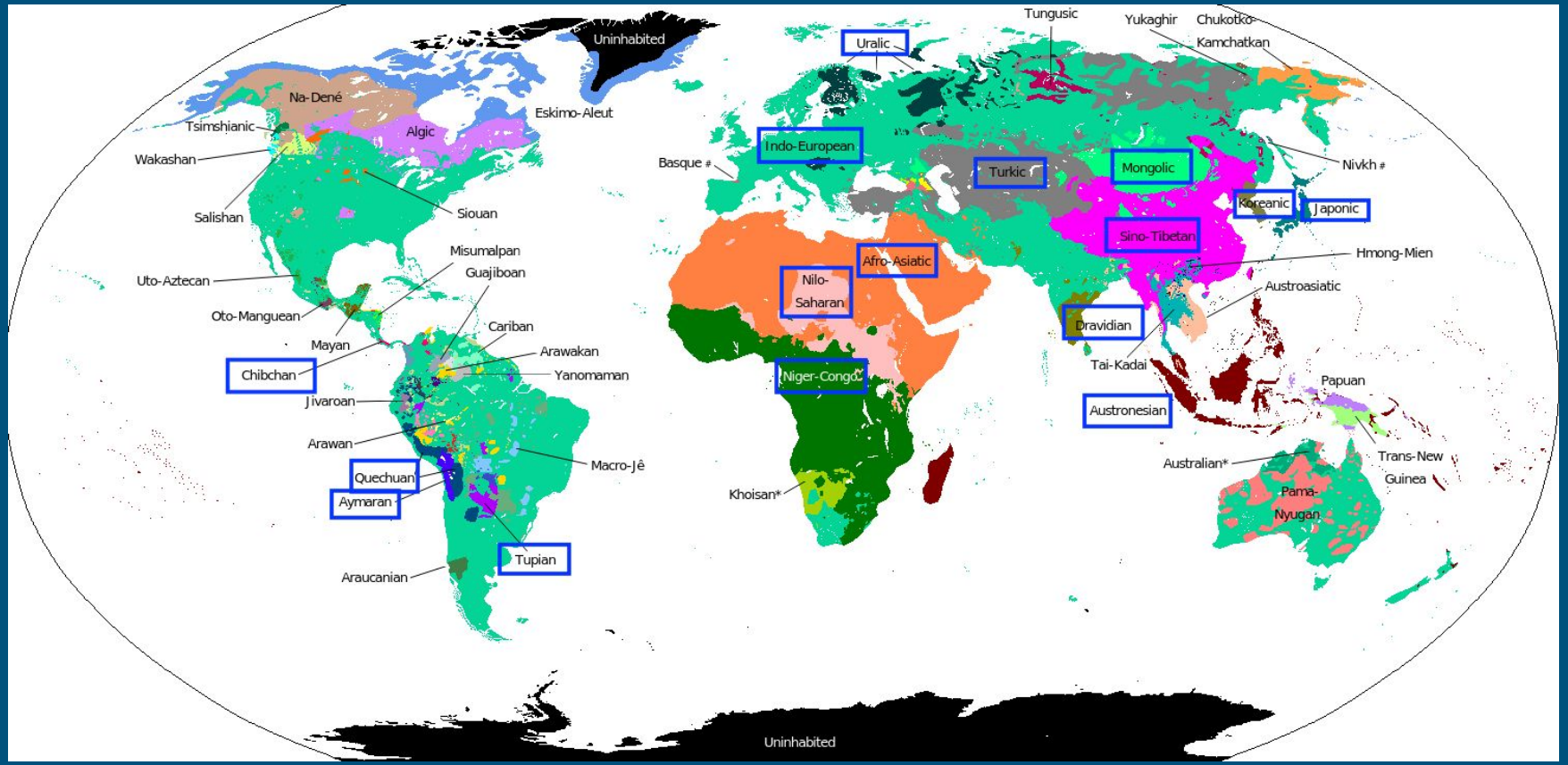
23 language families

Afro-Asiatic, Austronesian, Aymaran, Chibchan, Creole, constructed language, Dravidian, Indo-European, Japonic, Kartvelian, Khoe-Kwadi, Koreanic, Kra-Dai, Language Isolate, Mongolic, Niger Congo, Nilo-Saharan, Quechuan, Sino-Tibetan, Tucanoan, Tupian, Turkic, and Uralic

27 scripts

Arabic, Bengali, Burmese, Coptic, Cyrillic, Devanagari, Ethiopic, Georgian, Greek, Gujarati, Gurmukhi, Hangle, Hebrew, Japanese, Kannada, Khmer, Lao, Latin, Malayalam, Odia, Ol Chiki, Sinhala, Tamil, Telugu, Thai, Tibetan, and Vai

Babel-670


Uninhabited
Na-Dené
Tsimshianic
Wakashan
Salishan
Algic
Eskimo-Aleut
Siouan
Misumalpan
Guajiboan
Uto-Aztecan
Oto-Manguean
Mayan
Chibchan
Cariban
Arawakan
Yanomaman
Jivaroan
Arawan
Quechuan
Aymaran
Macro-Jê
Tupian
Araucanian
Uralic
Tungusic
Yukaghir
Chukotko-Kamchatkan
Indo-European
Basque #
Turkic
Mongolic
Nivkh #
Koreanic
Japonic
Sino-Tibetan
Afro-Asiatic
Nilo-Saharan
Niger-Congo
Khoisan*
Hmong-Mien
Austroasiatic
Dravidian
Tai-Kadai
Austronesian
Papuan
Australian*
Trans-New Guinea
Pama-Nyugan
Uninhabited

Tools

Langid.py

Lui et al. 2012

Naive Bayes

#Langs	#Babel-670 Common Langs	Acc	F1
97	78	92.39	88.80

Paper link: https://aclanthology.org/P12-3005/
Tool link: https://github.com/saffsd/langid.py

CLD2 (Compact Language Detector 2)

By Google on 2013

Naive Bayes

#Langs	#Babel-670 Common Langs	Acc	F1
83	66	96.03	91.22

Tool link: https://github.com/CLD2Owners/cld2

CLD3 (Compact Language Detector 3)

By Google on 2016

Neural Network

#Langs	#Babel-670 Common Langs	Acc	F1
106	83	96.02	89.53

Tool link: https://github.com/google/cld3

Fasttext

Joulin et al. 2016

Neural Network

#Langs	#Babel-670 Common Langs	Acc	F1
176	101	83.77	74.02

Paper link: https://arxiv.org/abs/1607.01759, https://arxiv.org/abs/1612.03651
Tool link: https://fasttext.cc/docs/en/language-identification.html

Franc

By Wormer from 2016 to now

model architecture unavailable

#Langs	#Babel-670 Common Langs	Acc	F1
414	216	81.05	66.28

Tool link: https://github.com/wooorm/franc

AfroLID

Adebara et al. 2022

Transformer neural network

#Langs	#Babel-670 Common Langs	Acc	F1
517	517	92.90	98.04

Paper link: https://arxiv.org/abs/2210.11744
Tool link: https://github.com/UBC-NLP/afrolid

How Good is ChatGPT at Identifying Languages?