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# Facilitating NLP specialists' access to language archive materials: an update

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## ABSTRACT

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We present a software tool to assemble a great range of diverse datasets from the [Pangloss](#) collection (a multimedia open archive of under-documented languages). The tool ensures the reproducibility of experiments conducted on these data. As an example, two transcribed audio corpora of Chinese minority languages (Japhug and Na) are proposed, under a Creative Commons license, as reference corpora for experiments in Natural Language Processing, and as examples of a pipeline that can be generalized to other corpora from open archives. An overarching goal of making language archive data available in an easily accessible and usable form is to facilitate the development and deployment of state-of-the-art natural language processing tools for the full range of human languages. This presentation, which follows a previous paper on the same topic, reports on new developments including feedback on a deposit at Hugging Face Datasets.

## RÉSUMÉ

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**Faciliter l'accès des praticiens du traitement automatique des langues à des jeux de données de langues rares : un deuxième point d'étape**

Nous présentons un outil logiciel qui permet d'assembler divers jeux de données de la collection [Pangloss](#) (archive ouverte multimédia de langues rares) en assurant la reproductibilité des expériences menées sur ces données. À titre d'exemple, deux corpus audio transcrits de langues minoritaires de Chine (japhug et na) sont proposés, sous une licence Creative Commons, comme corpus de référence pour des expériences en traitement automatique des langues, et comme exemples d'une chaîne de traitement généralisable à d'autres corpus d'archives ouvertes. L'enjeu global d'une mise à disposition de données de langues rares sous une forme aisément accessible et utilisable est de faciliter le développement et le déploiement d'outils de pointe en traitement automatique des langues naturelles pour tout l'éventail des langues humaines. Cet exposé, qui fait suite à une précédente communication sur le même thème, fait état de nouveautés dont un retour d'expérience concernant un dépôt auprès de Hugging Face.

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**KEYWORDS:** benchmark datasets, computational language documentation, endangered languages.

**MOTS-CLÉS :** corpus de référence, documentation computationnelle des langues, langues rares.

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# 1 Introduction

The deployment of automatic speech processing tools clearly has important implications for language documentation, at a time when the decline in linguistic diversity is accelerating (Kik et al., 2021), in parallel with the decline in biodiversity. Conversely, less-documented languages present a whole range of challenges to computational research, the interest of which is increasingly clearly perceived (Anastasopoulos et al., 2020). In this context, providing easily accessible, clearly versioned and user-friendly corpora of less-studied languages appears as a central necessity. This presentation, which follows a previous paper on the same theme (Galliot et al., 2021), presents our contribution to this endeavour. Following the example of the publication of the Mbochi (Bantu) corpus (Godard et al., 2018), we have deposited in Zenodo and in Hugging Face Datasets audio corpora (with transcriptions) of Japhug and Na, two minority languages of China.

These corpora have been used in automatic speech recognition work (Adams et al., 2018; Adams et al., 2021; Guillaume, Wisniewski, Macaire, et al., 2022; Macaire, 2021) and in interdisciplinary reflections associating NLP specialists and linguists (Guillaume, Wisniewski, Galliot, et al., 2022; Michaud et al., 2018; Michaud et al., 2020). The corpora are available online in an open archive, the Pangloss Collection<sup>1</sup> (Michaud et al., 2016), an open archive of (mostly) endangered languages, itself hosted by the Cocoon data repository<sup>2</sup>, ensuring availability in open access.

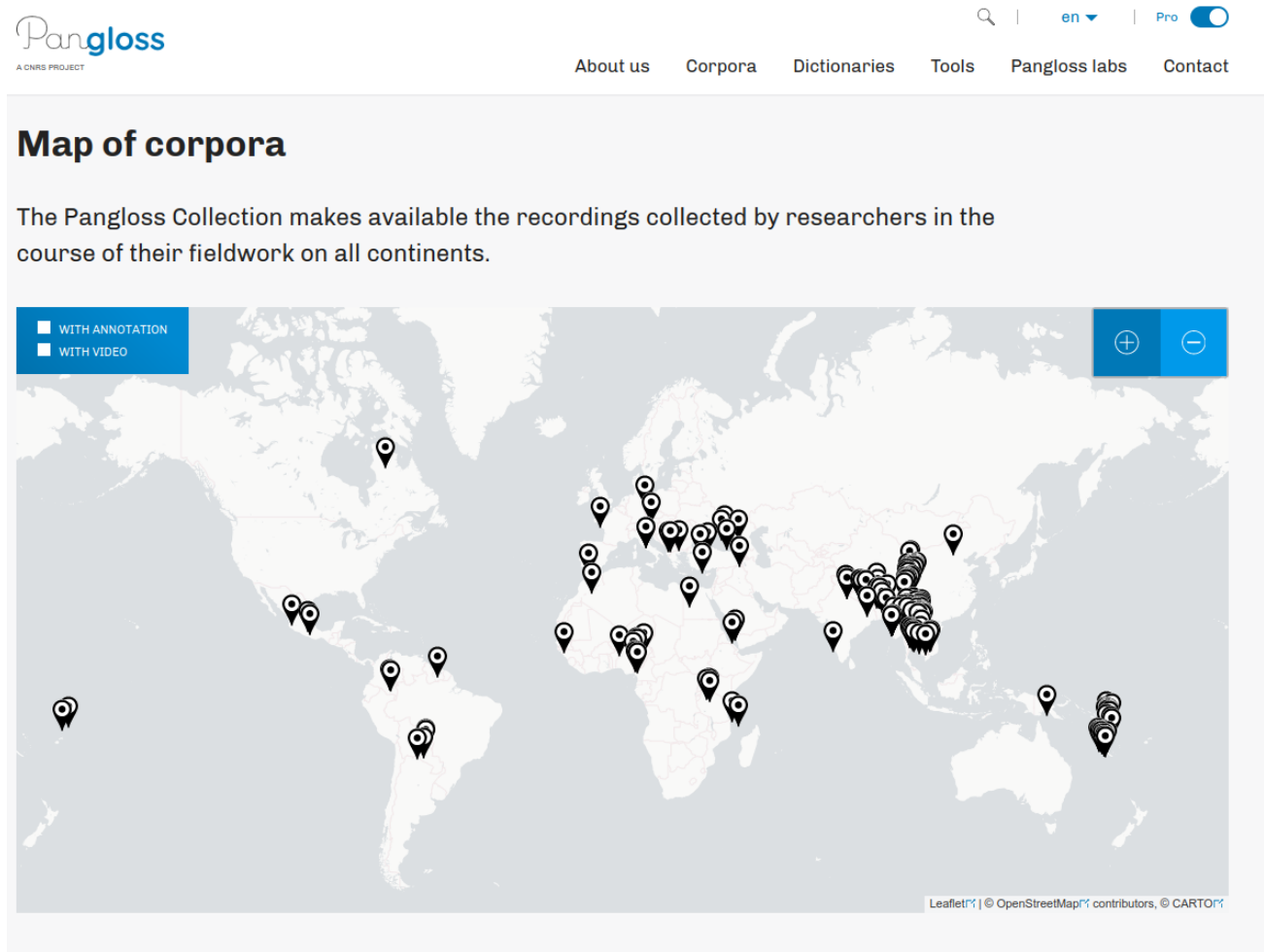


Figure 1: Pangloss – map of languages

<sup>1</sup><https://pangloss.cnrs.fr/>

<sup>2</sup><https://cocoon.huma-num.fr/>

Home / Corpus / Yongning Na

## Yongning Na (also known as *Narua* or *Mosuo* 摩梭语)

/nɑŋ-ɰwɿ/, i.e. the *Na language*, is spoken in an area straddling the boundary between the Chinese provinces of Yunnan and Sichuan, in the vicinity of lake Lugu (lo-ɬɣj-hi-ɲɑ-ɬmi-ɬ). The total number of speakers was estimated at about 40,000 on the basis of survey data from the late 1950s (He Jiren & Jiang Zhuyi 1985:107); the same figure is taken up by Yang Zhenhong (2009). The number of proficient speakers at present (2020) is much lower: language replacement is under way.

The Na are famous among anthropologists for their family structures, as a "society without marriage". Until the 21st century, much less attention was directed to their language, which has fascinating properties, such as its elaborate morphonology.

[See more](#)

### Resources

DOI	Type	Transcription(s)	Duration	Title	Researcher(s)	Speaker(s)
			00:08:37	Sister: The sister's wedding (version 1)	Michaud, Alexis	Latami, Dashilame — lɑ-ɬʰɑ-ɬmi-ɬ- [æ-ɬɰ-ɬ- lɑ-ɬmi-ɬ] — 拉它米 打史拉么
						Latami, Dashilame —

[中文介绍](#)



### Researchers

Michaud, Alexis



A sanctuary overlooking the plain of Yongning

Figure 2: Pangloss – page of a corpus: introduction and list of available multimedia resources

The transcriptions of these corpora are enriched and revised over the years, however, and new documents are added, so that referring to the open archive itself is not a sufficiently precise reference to achieve actual reproducibility of the experiments conducted on these data. Even though the primary data (the audio and video files) do not change, the transcriptions constitute “lukewarm data”, which get improved and modified slowly over time.

We have therefore made a deposit of a given state of these two corpora, making them accessible in a few clicks, in a stabilized form, in Zenodo (§3) and among the Hugging Face Datasets (§4). But the most important advance, in our view, is the creation of a script, *OutilsPangloss* (§2), to select among the corpora of the Pangloss Collection while maintaining a guarantee of full reproducibility (thanks to the versioning system of documents deposited in the archive).

## 2 A tool to build new datasets

The tool developed during the preparation of the corpora deposited in Zenodo and Hugging Face, entitled *OutilsPangloss*<sup>3</sup>, allows for putting together an open-ended range of new datasets. It consists of a toolbox in Julia language, which, among other functionalities, creates (sub)corpora of less-documented language data from the Pangloss Collection. The user fills in a YAML file (of which various examples are provided, see Figure 3a), specifying the names of the desired languages (as they

<sup>3</sup><https://gitlab.com/lacito/outilspangloss>

appears in the Pangloss Collection). It can also provide a list of regular expressions for modifications in case processing of annotations is to be carried out (such as deletions or rearrangements of text blocks). It is possible to filter by speaker. Processing on the audio can also be set, to choose the sampling rate and bit-depth, and to separate the different tracks of multi-channel files into mono files (demultiplexing).

After harvesting (in Sparql), metadata checks (hashing, versions, etc.), data checks (mistake detection, etc.), and downloads, a general summary file (see Figure 3b) is generated in the target folder, alongside data and metadata folders (see Figure 4). The information contained in this summary file is sufficient to reproduce exactly, at any time, an experiment conducted with the dataset it describes.

```

1  langue: Yongning Na
2  > modifications:--
9  corpus:
10  chemin: "../langues/corpus/Yongning Na"
11  nom complet: "Corpus de Na de Yongning complet"
12  commentaire: "Données complètes."
13  langue: fr
14  sous-corpus:
15  - récapitulatifs:
16    - nom de fichier: "Na de Yongning (annoté)"
17      nom complet: "Corpus de Na de Yongning (complet)"
18      commentaire: "Données annotées brutes."
19      langue: fr
20    - nom de fichier: "Yongning Na (annotated)"
21      nom complet: "Yongning Na corpus (complete)"
22      commentaire: "Raw annotated data."
23      langue: en
24  - sous-chemin: "Yongning Na - 16k-16"
25  traitements:
26    audio:
27      taux d'échantillonnage: 16000
28      profondeur: 16
29      spatialisation: "séparer"
30  récapitulatifs:
31  - nom de fichier: "Na de Yongning (annoté, converti)"
32    nom complet: "Corpus de Na de Yongning (complet)"
33    commentaire: "Données annotées brutes, conversion audio réalisée par Sox 14.4.2."
34    langue: fr
35  - nom de fichier: "Yongning Na (annotated, converted)"
36    nom complet: "Yongning Na corpus (complete)"
37    commentaire: "Raw annotated data, audio conversion performed by Sox 14.4.2."
38    langue: en
39  conversions:
40  - format: "HuggingFace-Transformers"
41    sous-chemin: "corpus HFT Yongning Na - 16k-16"
42    nom de fichier: "Na de Yongning (annoté, converti)"
43    nom du corpus: "yong1288"
44

```

(a) corpus configuration

```

1  langue: "Yongning Na"
2  nom: "Corpus de Yongning Na (complet)"
3  commentaire: "Données annotées brutes, conversion audio réalisée par Sox 14.4.2."
4  lien_documentation: "https://pangloss.cnrs.fr/corpus/Yongning320Na"
5  code_langue: "nru"
6  version: "1.0"
7  > modifications:--
17 nombre_patrimoines_culturels: 116
18 nombre_fichiers: 232
19 nombre_audios: 116
20 nombre_annotations: 116
21 ressources:
22 - identifiant: "CHO_cocoon-014b91c5-06a7-336c-8dc0-94b7fcca3ef"
23   type: "patrimoine culturel"
24   lien_métadonnées: "http://cocoon.huma-num.fr/pub/CHO_cocoon-014b91c5-06a7-336c-8dc0-94b7fcca3ef"
25   locuteur: "Latami, DashiLame"
26   enfants:
27     - identifiant: "WR_Record1_cocoon-014b91c5-06a7-336c-8dc0-94b7fcca3ef"
28       type: "audio original"
29       lien_métadonnées: "http://cocoon.huma-num.fr/pub/WR_Record1_cocoon-014b91c5-06a7-336c-8dc0-94b7fcca3ef"
30       lien_données: "http://purl.org/net/crdo/data/cocoon-014b91c5-06a7-336c-8dc0-94b7fcca3ef.version1"
31       clef_hachage: "4452db2de5627a61f89610179c28829"
32       version: 1
33       profondeur: 24
34       taux_échantillonnage: 44100
35       spatialisation: 1
36       enfants:
37         - type: "audio converti"
38           chemin_données: "Yongning Na - 16k-16/cocoon-014b91c5-06a7-336c-8dc0-94b7fcca3ef_C1.wav"
39           clef_hachage: "10ee9bd19926ec9de9ea86bce53a6688"
40           profondeur: 16
41           taux_échantillonnage: 16000
42           spatialisation: 1
43         - identifiant: "WR_Transcr1_cocoon-014b91c5-06a7-336c-8dc0-94b7fcca3ef"
44           type: "annotation originale"
45           lien_métadonnées: "http://cocoon.huma-num.fr/pub/WR_Transcr1_cocoon-014b91c5-06a7-336c-8dc0-94b7fcca3ef"
46           lien_données: "http://cocoon.huma-num.fr/data/michaud/masters/crdo-NRU-F4_TONEPEOPLES.xml"
47           version: 5
48           date_modification: "2022-02-16T16:41:58+01:00"
49           nature: "WORDLIST"
50           enfants:
51             - type: "annotation dupliquée"
52               chemin_données: "Yongning Na - 16k-16/cocoon-014b91c5-06a7-336c-8dc0-94b7fcca3ef_C1.xml"
53               clef_hachage: "b49da71311fd2643ab4da0ac9580cf6"
54             - identifiant: "CHO_cocoon-037c0b5f-33ba-34fb-83c6-39c26e4d09f8"
55               type: "patrimoine culturel"
56               lien_métadonnées: "http://cocoon.huma-num.fr/pub/CHO_cocoon-037c0b5f-33ba-34fb-83c6-39c26e4d09f8"
57               locuteur: "Latami, DashiLame"

```

(b) Versioned corpus (list of resources, metadata...)

Figure 3: OutilsPangloss : YML files

Nom	Taille
corpus HFT Yongning Na – 16k-16	3 éléments
données	433 éléments
données.yml	416,7 ko
métadonnées	750 éléments
ressources obsolètes	2 éléments
Yongning Na – 16k-16	348 éléments
Yongning Na (annotated).yml	133,3 ko
Yongning Na (annotated, converted).yml	220,6 ko
Yongning Na (annoté).yml	138,5 ko
Yongning Na (annoté, converti).yml	230,7 ko

Figure 4: OutilsPangloss: local target folder of a corpus



Nom	Taille
cocoon-0a8404b4-49ee-3c80-964f-99320dad78f5_C1.wav	2,8 Mo
cocoon-0a8404b4-49ee-3c80-964f-99320dad78f5_C1.xml	14,2 ko
cocoon-0a8404b4-49ee-3c80-964f-99320dad78f5_C2.wav	2,8 Mo
cocoon-0a8404b4-49ee-3c80-964f-99320dad78f5_C2.xml	14,2 ko
cocoon-0ce38fef-4386-3446-b5b2-fc420d4cf148_C1.wav	6,5 Mo
cocoon-0ce38fef-4386-3446-b5b2-fc420d4cf148_C1.xml	43,4 ko
cocoon-0f6d7ca2-2fbd-3601-b3a5-b54232b43def_C1.wav	34,5 Mo
cocoon-0f6d7ca2-2fbd-3601-b3a5-b54232b43def_C1.xml	132,5 ko
cocoon-0f4576b5-e917-35a2-92f6-fed919660f5e_C1.wav	4,9 Mo
cocoon-0f4576b5-e917-35a2-92f6-fed919660f5e_C1.xml	44,0 ko
cocoon-1d91ab4c-fea9-3fd7-976f-e6753a255d1c_C1.wav	24,0 Mo
cocoon-1d91ab4c-fea9-3fd7-976f-e6753a255d1c_C1.xml	320,9 ko
cocoon-1fee21d5-125f-313d-aab7-121aa9c2cac5_C1.wav	8,9 Mo
cocoon-1fee21d5-125f-313d-aab7-121aa9c2cac5_C1.xml	172,5 ko
cocoon-1fee21d5-125f-313d-aab7-121aa9c2cac5_C2.wav	8,9 Mo
cocoon-1fee21d5-125f-313d-aab7-121aa9c2cac5_C2.xml	172,5 ko
cocoon-2bf8107a-6054-31b9-a355-38cb1f16706b_C1.wav	17,3 Mo
cocoon-2bf8107a-6054-31b9-a355-38cb1f16706b_C1.xml	84,3 ko
cocoon-2f5bb477-5267-38ea-bf77-f4e6dc258e9d_C1.wav	27,7 Mo
cocoon-2f5bb477-5267-38ea-bf77-f4e6dc258e9d_C1.xml	129,4 ko
cocoon-2f282ddc-cd08-32e0-b6b3-82f77cf0bf30_C1.wav	14,5 Mo
cocoon-2f282ddc-cd08-32e0-b6b3-82f77cf0bf30_C1.xml	53,8 ko
cocoon-2f282ddc-cd08-32e0-b6b3-82f77cf0bf30_C2.wav	14,5 Mo
cocoon-2f282ddc-cd08-32e0-b6b3-82f77cf0bf30_C2.xml	53,8 ko
cocoon-3b9c6235-e8a5-3927-8e35-029664ed0a14_C1.wav	37,9 Mo

(a) processed resources

Nom	Taille
cocoon-0a8404b4-49ee-3c80-964f-99320dad78f5_C1	33 éléments
cocoon-0ce38fef-4386-3446-b5b2-fc420d4cf148_C1	80 éléments
cocoon-0f6d7ca2-2fbd-3601-b3a5-b54232b43def_C1	200 éléments
cocoon-0f4576b5-e917-35a2-92f6-fed919660f5e_C1	81 éléments
cocoon-1d91ab4c-fea9-3fd7-976f-e6753a255d1c_C1	157 éléments
cocoon-1fee21d5-125f-313d-aab7-121aa9c2cac5_C1	73 éléments
cocoon-2bf8107a-6054-31b9-a355-38cb1f16706b_C1	141 éléments
cocoon-2f5bb477-5267-38ea-bf77-f4e6dc258e9d_C1	223 éléments
cocoon-2f282ddc-cd08-32e0-b6b3-82f77cf0bf30_C1	117 éléments
cocoon-3b9c6235-e8a5-3927-8e35-029664ed0a14_C1	118 éléments
cocoon-3dd9341b-647a-33d3-b0fd-2b0ab0e7f638_C1	181 éléments
cocoon-3e084f49-332e-3744-88fc-cf5098405829_C1	20 éléments
cocoon-4a89f909-3102-3033-8afa-0b3bf27fe908_C1	115 éléments
cocoon-5a006333-133d-3952-94e0-cf774e0ca4b_C1	32 éléments
cocoon-6b82b0f2-27b4-317b-82b9-42b2e79587b5_C1	110 éléments
cocoon-6bc8b80b-22f6-3986-92e3-4c6ed75ef0b5_C1	189 éléments
cocoon-6bd9a90b-95ac-374c-b12c-590fab22ad3c_C1	64 éléments
cocoon-6c87371d-f9ad-3496-83a4-5d5bf02b9388_C1	32 éléments
cocoon-7af967c5-d09c-332d-9bcd-9144c40e65b2_C1	79 éléments
cocoon-7d0ee91a-94ff-37f5-bccc-29c31fb7f4d_C1	120 éléments
cocoon-7d1f65c6-d83a-3e01-85b3-2e1d4cb901f9_C1	78 éléments
cocoon-7f9f8056-d111-3119-bafe-526f4160f0a4_C1	108 éléments
cocoon-8c729359-ac07-46bd-b293-59ac07b6db5_C1	33 éléments
cocoon-8e777be5-ab06-3fe9-b4f6-ac4123603ab7_C1	40 éléments
cocoon-8fd61350-7519-3b5d-a8b0-ba886d29b97_C1	176 éléments

(b) processed resources for the Hugging Face format

Figure 5: OutilsPangloss : données

### 3 The Zenodo deposits: access links and explanations about technical choices

**Links to the repository** The Na and Japhug corpora were uploaded to Zenodo, where they constitute deposits 5336698 (Na) and 5521112 (Japhug), respectively. An entire corpus is identified by a DOI (*digital object identifier*): 10.5281/zenodo.5521112 for the [Japhug corpus](#), and 10.5281/zenodo.5336698 for the [Na corpus](#).

The same type of identifier has been deployed for the Pangloss Collection, the open archive where the corpora are deposited, but with a completely different granularity: a DOI for each document (Vasile et al., 2020), a choice which is suitable for linguists who wish to reference data at a highly specific level (a text and, within a text, a specific utterance) but does not give a handle on an entire corpus.

**Audio files** Audio files were downgraded to 16-bit, 16 kHz, mono (see Figure 5a). The logic behind this choice of parameters is that NLP experiments have requirements that differ from those of long-term archiving in the Pangloss Collection. The size of the two datasets deposited in Zenodo is compatible (as of today) with experiments carried out on a laptop computer: 1.8 GB for Na, 9.2 GB for Japhug.

**Annotations** The annotations are in the original format: XML structured according to a simple hierarchy (a text is composed of sentences, themselves composed of words, themselves composed of morphemes). An example is provided in Figure 6.

Some basic preprocessing has been carried out, so that users do not have to learn about the various conventions chosen by the depositors, which vary across corpora. In particular, when transcribing texts, it is not infrequent for language consultants and language workers (typically linguists) to make decisions that create an edit distance between the transcription and what is actually said in the recording. A convention used in the Na corpus is that added passages are placed within square brackets. Another convention is that passages that the language consultants wish to see removed from the “smoothed” transcription are placed between angle brackets. At preprocessing, the passages within square brackets were deleted, and the angle brackets were removed, thereby ensuring the closest match between audio and transcriptions.

<pre> 1 &lt;?xml version="1.0" encoding="utf-8"?&gt; 2 &lt;DOCTYPE WORDLIST SYSTEM "https://cocoon.huma-num.fr/schemas/Archive.did"&gt; 3 &lt;WORDLIST id="crdo-NRU_F4_TONE12" xml:lang="nru"&gt; 4 &lt;HEADER&gt; 5 &lt;TITLE xml:lang="en"&gt;The tones of compound nouns: body parts of animals, document 12. Speaker F4, year 2008; 6 with electroglottographic signal.&lt;/TITLE&gt; 7 &lt;SOUNDFILE href="Tone_BodyPartsOfAnimals.12_F4_2008_withEGG.wav"/&gt; 8 &lt;/HEADER&gt; 9 &lt;NOTE xml:lang="en" message="All the compound nouns are framed in the sentence 'This is...: proximal demonstrative / 10 ts^w1   +target item +copula, /pij/. The demonstrative is realized [ts^w1] due to utterance-initial position. The 11 tone of the copula in context depends on what precedes."/&gt;&lt;NOTE xml:lang="en" message="The elicitation was arranged 12 by head rather than by determiner: 'pig's skin' then 'tiger's skin', etc. This limits the repetitiveness of the 13 successive items, because the tone of the head has less influence on that of the compound than the tone of the 14 determiner: 'pig's skin', 'pig's intestines', 'pig fat' are more similar tonally than 'pig's skin', 'tiger's 15 skin', 'sheep's skin'... The present document, on the other hand, is arranged by determiner ('pig's skin', 'pig's 16 intestines', 'pig fat'...; then 'tiger's skin', 'tiger's intestines' and so on), as this seemed the more useful order 17 of presentation to study the tone system."/&gt;&lt;NOTE xml:lang="fr" message="Toutes les expressions sont précédées de / 18 ts^w1 /, réalisé [ts^w1], et suivies de la copule, /pij/, dont le ton en contexte dépend de ce qui précède."/ 19 &gt;&lt;NOTE xml:lang="fr" message="L'élitication est arrangée par tête (déterminé). Ce choix évite la monotonie tonale 20 d'un arrangement par déterminant, car le ton du déterminant a une plus grande influence sur celui du composé que le 21 ton de la tête. Le présent document, en revanche, est présenté par déterminant."/&gt;&lt;w 22 id="Tone_BodyPartsOfAnimals.12_F4_2008_withEGG_001"&gt; 23 &lt;FORM ts^w1   boj-yw1 pij/&gt;&lt;FORM&gt; 24 &lt;NOTE xml:lang="en" message="Determiner: boj^1"/&gt; 25 &lt;NOTE xml:lang="en" message="Head: wj^1"/&gt; 26 &lt;NOTE xml:lang="en" message="Input tones (separated by a space): LM LH"/&gt; 27 &lt;NOTE xml:lang="en" message="Output tone: LM"/&gt; 28 &lt;TRANSL xml:lang="fr"&gt;peau de porc (couenne de porc)&lt;/TRANSL&gt; 29 &lt;TRANSL xml:lang="zh"&gt;豬的皮&lt;/TRANSL&gt; 30 &lt;TRANSL xml:lang="en"&gt;pig's skin&lt;/TRANSL&gt; 31 &lt;AUDIO start="729.122" end="730.713"/&gt; 32 &lt;/w&gt; 33 &lt;w id="Tone_BodyPartsOfAnimals.12_F4_2008_withEGG_002"&gt; 34 &lt;FORM ts^w1   boj-yw1 pij/&gt;&lt;FORM&gt; 35 &lt;NOTE xml:lang="en" message="Determiner: boj^1"/&gt; 36 &lt;NOTE xml:lang="en" message="Head: by^1"/&gt; 37 &lt;NOTE xml:lang="en" message="Input tones (separated by a space): LM M"/&gt; 38 &lt;NOTE xml:lang="en" message="Output tone: LM"/&gt; 39 &lt;TRANSL xml:lang="fr"&gt;intestin de porc&lt;/TRANSL&gt; 40 &lt;TRANSL xml:lang="zh"&gt;豬的腸子&lt;/TRANSL&gt; </pre>	<pre> 57 xmlns:eac-cpf="http://archivi.ibc.regione.emilia-romagna.it/ontology/eac-cpf/" 58 xmlns:foaf="http://xmlns.com/foaf/0.1/" 59 xmlns:lgdo="http://linkedgeodata.org/ontology/capital" &gt; 60 &lt;rdf:Description rdf:about="http://cocoon.huma-num.fr/pub/WR_Transcri1_cocoon-db3cf0e1-30bb-3225-b012-019252bb4fd"&gt; 61 &lt;dc:terms:accessRights&gt;Freely accessible&lt;/dc:terms:accessRights&gt; 62 &lt;dc:terms:issued&gt;rdf:datatype="http://purl.org/dc/terms/W3CDTF"&gt;2013-09-21T21:18:16+02:00&lt;/dc:terms:issued&gt; 63 &lt;dc:identifier&gt;oai:crdo.vjf.cnrs.fr:cocoon-5970d5ad-f863-33f5-adf9-71842837be9b&lt;/dc:identifier&gt; 64 &lt;dc:type&gt;rdf:resource="http://www.language-archives.org/vocabulury/type/lexicon"/&gt; 65 &lt;dc:identifier&gt;doi:10.34847/cocoon.5970d5ad-f863-33f5-adf9-71842837be9b&lt;/dc:identifier&gt; 66 &lt;dc:terms:replaces&gt;rdf:resource="http://cocoon.huma-num.fr/data/michaud/masters/versions/crdo-NRU_F4_TONE12.v3.xml"/&gt; 67 &lt;dc:terms:license&gt;rdf:resource="http://creativecommons.org/licenses/by-nc-sa/2.5"/&gt; 68 &lt;dc:identifier&gt;hdl:10670/1.aralrux&lt;/dc:identifier&gt; 69 &lt;dc:type&gt;rdf:resource="http://purl.org/dc/dcmitype/Text"/&gt; 70 &lt;dc:terms:replaces&gt;rdf:resource="http://cocoon.huma-num.fr/data/michaud/masters/versions/crdo-NRU_F4_TONE12.v2.xml"/&gt; 71 &lt;dc:subject&gt;rdf:resource="http://lexvo.org/id/iso639-3/nru"/&gt; 72 &lt;foaf:primaryTopic&gt;rdf:resource="http://cocoon.huma-num.fr/data/michaud/masters/crdo-NRU_F4_TONE12.xml"/&gt; 73 &lt;dc:ac:depositor&gt;rdf:resource="http://viaf.org/viaf/120871374"/&gt; 74 &lt;dc:subject&gt;Yongning Na&lt;/dc:subject&gt; 75 &lt;dc:language&gt;rdf:resource="http://lexvo.org/id/iso639-3/nru"/&gt; 76 &lt;dc:identifier&gt;doi:10.24397/PANGLOSS-000463&lt;/dc:identifier&gt; 77 &lt;dc:ac:speaker&gt;rdf:resource="http://cocoon.huma-num.fr/pub/person_200#foaf:Person"/&gt; 78 &lt;dc:terms:created&gt;rdf:datatype="http://purl.org/dc/terms/W3CDTF"&gt;2008&lt;/dc:terms:created&gt; 79 &lt;dc:ac:researcher&gt;rdf:resource="http://viaf.org/viaf/120871374"/&gt; 80 &lt;dc:terms:replaces&gt;rdf:resource="http://cocoon.huma-num.fr/data/michaud/masters/versions/crdo-NRU_F4_TONE12.v1.xml"/&gt; 81 &lt;dc:identifier&gt;doi:10.24397/PANGLOSS-000463&lt;/dc:identifier&gt; 82 &lt;dc:terms:modified&gt;2022-02-16T16:39:24+01:00&lt;/dc:terms:modified&gt; 83 &lt;dc:terms:available&gt;rdf:datatype="http://purl.org/dc/terms/W3CDTF"&gt;2013-09-21&lt;/dc:terms:available&gt; 84 &lt;dc:contributor&gt;rdf:resource="http://cocoon.huma-num.fr/pub/person_200#foaf:Person"/&gt; 85 &lt;dc:terms:conformsTo&gt;rdf:resource="http://cho.cocoon-49aefa90-8c1f-3ba8-a099-0ebefc6a2aa"/&gt; 86 &lt;dc:publisher&gt;rdf:resource="http://cocoon.huma-num.fr/pub/org_50#org:Organization"/&gt; 87 &lt;dc:contributor&gt;rdf:resource="http://viaf.org/viaf/120871374"/&gt; 88 &lt;dc:identifier&gt;ark:/87895/1.17-369643&lt;/dc:identifier&gt; 89 &lt;dc:ac:interviewer&gt;rdf:resource="http://viaf.org/viaf/120871374"/&gt; 90 &lt;rdf:type&gt;rdf:resource="http://www.europeana.eu/schemas/edm/WebResource"/&gt; 91 &lt;dc:format&gt;rdf:datatype="http://purl.org/dc/terms/IMT"&gt;text/xml&lt;/dc:format&gt; 92 &lt;dc:title&gt;xml:lang="en"&gt;Tone: compound nouns. Body parts of animals 12, F4, 2008, with EGG&lt;/dc:title&gt; 93 &lt;dc:rights&gt;Copyright (c) Michaud, Alexis&lt;/dc:rights&gt; 94 &lt;schema-org:version&gt;4&lt;/schema-org:version&gt; 95 &lt;/rdf:Description&gt; 96 &lt;/rdf:RDF&gt; </pre>
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(a) data

(b) metadata

Figure 6: XML files of annotation resources

## 4 The Pangloss corpus in Hugging Face Datasets

Hugging Face (HF) Datasets are currently a key hub for NLP researchers looking for easily usable corpora. The formatting of Pangloss corpora in HF format therefore seemed useful from the perspective of bringing corpora from less-studied languages to the attention of NLP researchers.

**Preparing the data for Hugging Face Datasets format** Each annotation file is divided into as many files as there are first-level units (sentences for texts, words for vocabulary lists). These files are named after these units, and are placed in folders named after the original resource (see Figure 5b). These data, structured in a tabular manner, contain some relevant metadata, such as the nature of the resource (word list or text) or the speaker. The data are then randomly partitioned. By default, the partitioning is carried out at the first level below the entire resource: hence sentences for texts, and words in the case of word lists. But it is possible to choose the level of the entire file instead. Three sets are thereby created: training, validation and test, thus three CSV files (see figure 7). Finally, all these data (audio files of the sentences and the three CSV files) are uploaded on a server.

**Preparing the publicly available dataset** A second part of the work consists in formally preparing the new datasets<sup>4</sup>. To achieve this, a precise description of each corpus is required. Particular attention is paid to the encoding of the language concerned<sup>5</sup>, a delicate point in the case of languages that are not standardized (or only slightly standardized), which constitute the core business of the Pangloss Collection. A Python script<sup>6</sup> automates the creation of the dataset from the previously uploaded and accessible corpus archives. This script, of varying complexity depending on the dataset, is used to specify where the formatted archives are stored, the data types of each column, and their corresponding names. It is then possible to view the corpus data directly online and to listen to the audio segments (see Figure 8).

The choice made consists in creating one global dataset named Pangloss, of which the various

<sup>4</sup>Available here: <https://huggingface.co/datasets/Lacito/pangloss>

<sup>5</sup><https://github.com/huggingface/datasets/issues/4881>

<sup>6</sup><https://huggingface.co/datasets/Lacito/pangloss/blob/main/pangloss.py>

	chemin_audio	nature	locuteur	forme	traduction:fr	traduction:zh	traduction:en	chemin_audio_segment
5966	cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1/Tone_BodyPartsOfA	WORDLIST	Latami, Dashilame	[tsʰuwi   qɾɪmiŋ-ɦiɪpɪl ɲil]	oreilles de renard	狐狸的耳朵	fox's ears	../langues/corpus/Yongning Na/corpus HFT Yongning Na - 16k-16/Yongning Na/cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1/Tone_BodyPartsOfA
5967	cocoon-71bb9ae8-6794-3509-a8a1-d48f585b1e5e_C1/NumPlusCL_L3_Bun	WORDLIST	Latami, Dashilame	[ɲɪɾɪ-qɔl]	5 grosses bottes (de paille...)	5抱 (麦秆.....)	5 large bundles (of straw...)	../langues/corpus/Yongning Na/corpus HFT Yongning Na - 16k-16/Yongning Na/cocoon-71bb9ae8-6794-3509-a8a1-d48f585b1e5e_C1/NumPlusCL_L3_Bun
5968	cocoon-fef3d2b8-7b82-371e-be90-c02850fa95e6_C1/HOUSEBUILDING2_S	TEXT	Latami, Dashilame	[ʰiɪ   tsʰuwi   soɪ-bæŋ-ɦiŋ   tsʰuwi-dʒɔɪ   tsʰeɪɪɦ-dʒɔɪ   ɹiɦ-qɾɪ dɔɪ-tsoɪ-ɲil]   pɪɦ-zɔɪ   [ɣɪɦɪɪmiɪ-qɔl-ɲuɪ   ɪəə... ɦɪɪbɪl- tsʰuwi   ɦeɪ-qwæɪ   wɾɪ   ɔɪsɔɪ   ɦɪqɔɪ   ʰɦ-ɦɪɦ-ɦiŋ-ɦiŋ-ɦiŋ   ɣɾɪ-qwæɪ!]	Alors, ces trois sortes (la locutrice inclut les feuilles de navet dans la liste, acceptant élargement la suggestion qui lui a été faite)... Comme on se dit: "Cette année, on va construire une maison", au neuvième mois, euh... on va déterrer les radis; ce qu'on a planté sur les terres de la famille, on le déterre!			../langues/corpus/Yongning Na/corpus HFT Yongning Na - 16k-16/Yongning Na/cocoon-fef3d2b8-7b82-371e-be90-c02850fa95e6_C1/HOUSEBUILDING2_S
5969	cocoon-4419730d-5bad-387b-9a15-47a5bb5418ae_C1/Tone_BodyPartsOfA	WORDLIST	Latami, Dashilame	[tsʰuwi   pɔɪloɦ-byɪ   qɪɦtsæɪ ɲil]	gorge de bœuf	公绵羊的喉咙	ram's throat	../langues/corpus/Yongning Na/corpus HFT Yongning Na - 16k-16/Yongning Na/cocoon-4419730d-5bad-387b-9a15-47a5bb5418ae_C1/Tone_BodyPartsOfA
5970	cocoon-285cfefb-5ba1-3c90-b6c7-ce7ea0a2197f_C1/NumPlusCL_MH2_Pe	WORDLIST	Latami, Dashilame	[ɣɦtsʰiɪɣɪ-ɦɪ]	99+classificateur des personnes/hommes	99个人	99+classifier for people/persons	../langues/corpus/Yongning Na/corpus HFT Yongning Na - 16k-16/Yongning Na/cocoon-285cfefb-5ba1-3c90-b6c7-ce7ea0a2197f_C1/NumPlusCL_MH2_Pe

(a) data for the Hugging Face format

	identifiant_annotation	chemin_annotation	identifiant_audio	chemin_audio	identifiant_forme	nature	locuteur	début	fin	forme	traduction:fr	traduction:zh	traduction:en	chemin_audio_segment
9399	cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	Yongning Na - 16k-16/cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	Tone_BodyPartsOfAnim	WORDLIST	Latami, Dashilame	988.0	1003.0	[tsʰuwi   qɾɪmiŋ-ɦiɪpɪl ɲil]	oreilles de renard	狐狸的耳朵	fox's ears	../langues/corpus/Yongning Na/corpus HFT Yongning Na - 16k-16/Yongning Na/cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1/Tone_E
9400	cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	Yongning Na - 16k-16/cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	Tone_BodyPartsOfAnim	WORDLIST	Latami, Dashilame	1078.0	1080.0	[tsʰuwi   qɾɪmiŋ-ɦiɪpɪl ɲil]	taille de renard	狐狸的腰	fox's waist	../langues/corpus/Yongning Na/corpus HFT Yongning Na - 16k-16/Yongning Na/cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1/Tone_E
9401	cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	Yongning Na - 16k-16/cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	Tone_BodyPartsOfAnim	WORDLIST	Latami, Dashilame	1170.0	1172.0	[tsʰuwi   qɾɪmiŋ-ɦiɪpɪl ɲil]	yeux de renard	狐狸的眼睛	fox's eyes	../langues/corpus/Yongning Na/corpus HFT Yongning Na - 16k-16/Yongning Na/cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1/Tone_E
9402	cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	Yongning Na - 16k-16/cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	Tone_BodyPartsOfAnim	WORDLIST	Latami, Dashilame	1227.0	1229.0	[tsʰuwi   qɾɪmiŋ-ɦæɦɪɪ ɲil]	cou de renard	狐狸的脖子	fox's neck	../langues/corpus/Yongning Na/corpus HFT Yongning Na - 16k-16/Yongning Na/cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1/Tone_E
9403	cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	Yongning Na - 16k-16/cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	Tone_BodyPartsOfAnim	WORDLIST	Latami, Dashilame	208.37	210.5	[tsʰuwi   zɹwæɦzɔɦ-yuɪ ɲil]	peau de poulain	马驹子的皮	colt's skin	../langues/corpus/Yongning Na/corpus HFT Yongning Na - 16k-16/Yongning Na/cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1/Tone_E
9404	cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	Yongning Na - 16k-16/cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1.xml	Tone_BodyPartsOfAnim	WORDLIST	Latami, Dashilame	280.25	282.25	[tsʰuwi   zɹwæɦzɔɦ-byɪ ɲil]	intestin de poulain	马驹子的肠子	colt's intestine	../langues/corpus/Yongning Na/corpus HFT Yongning Na - 16k-16/Yongning Na/cocoon-db3cf0e1-30bb-3225-b012-019252bb4f4d_C1/Tone_E

(b) data in Hugging Face format, after random partitioning

Figure 7: OutilsPangloss: CSV files

languages (Japhug<sup>7</sup>, and Yongning Na<sup>8</sup>) constitute sub-sets.

It is then possible to load the desired data set and get experiments started in just two lines of Python code.<sup>9</sup>

<sup>7</sup><https://huggingface.co/datasets/Lacito/pangloss/viewer/japh1234/train>  
<sup>8</sup><https://huggingface.co/datasets/Lacito/pangloss/viewer/yong1288/train>  
<sup>9</sup>`import datasets then`  
`datasets.load_dataset("pangloss", "japh1234")` for Japhug, and  
`datasets.load_dataset("pangloss", "yong1288")` for Yongning Na.



Dataset Preview API

Subset: yong1288 Split: train

path (string)	audio (audio)	sentence (string)	doctype (string)	translation:fr (string)	translation:en (string)	translation:zh (string)
"coco0n-d62e5852-a63f-3674-b09c-6b175a21cb81_C1/Tone_BodyParts0fAnimals_6_Ve..."		"i,   [shw   Zmwzoi-bv   pil]"	"WORDLIST"	"intestin de poulain"	"colt's intestine"	"马驹子的肠子"
"coco0n-adf9c39f-e558-36ac-963a-e5b8f76e812_C1/F00D_SHORTAGE25061.wav"		"t'hij,   oiddi t'hv-i-riwi,  ..."	"TEXT"	"Alors, le père, il s'est tenu assis là, regardant..."	".."	".."
"coco0n-9245e7d0-3e19-3eac-8f3e-2dc3a04bbf43_C1/Sister3_S135.wav"		"tojmij dâl-kvj-tswj ô -mvj,  ..."	"TEXT"	"On frappe les poteaux; on donne un coup par ici, on..."	".."	"要打柱子: 这边打一下, 那边打一下, "
"coco0n-5152256a-dd16-345a-9325-73920210692c_C1/F4_TONETUTORIAL_PART3_025.wa..."		"joj-kil"	"WORDLIST"	".."	"to (a/the) sheep"	".."
"coco0n-3dd9341b-647a-33d3-b0fd-2b0ab0e7f638_C1/Sister_S090.wav"		"njam-smjkv   hi   lei-zi-dzo    ..."	"TEXT"	"chez nous autres, quand quelqu'un meurt,"	"(when) (one of) our people dies, then"	"我们, 一个人去世的时候, 那么, "
"coco0n-6bd9a90b-95ac-374c-b12c-590fab22ad3c_C1/NumPlusCL_L3_Bund1e0fHay_1to..."		"Zvits'hij   soj-qdij]"	"WORDLIST"	"43 grosses bottes (de paille...)"	"43 large bundles (of straw...)"	"43 抱 (麦秆...) "

Figure 8: Page of the Pangloss corpus on Hugging Face Datasets

## 5 Perspectives: what is at stake in providing a full description of datasets without creating “hard copies”

The ongoing transition to Open Science carries a fundamental requirement for reproducibility of experiments, and the field of speech sciences and Automatic Language Processing is no exception (Garellek et al., 2020). Our hope is that practices will gradually evolve towards a description of datasets via metadata pointing to one master file hosted in an archive that guarantees both long-term conservation and 24/7 online availability. Describing the datasets in this way only takes a few kilobytes (Kb), whereas hosting each dataset as a “hard copy” would result in multiple and highly redundant deposits (in Zenodo or elsewhere) each of which amounts to gigabytes (GB).

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