naab: A ready-to-use plug-and-play corpus for Farsi

Sadra Sabouri[1*], **Elnaz Rahmati**[1], **Soroush Gooran**[1], **Hossein Sameti**[1]

[1] SLPL, Computer Engineering Department, Sharif University of Technology, Tehran, Iran

sadra@ee.sharif.edu[*], elnaz.rahmati@sharif.edu, gooran@ce.sharif.edu, sameti@sharif.edu

Abstract

Huge corpora of textual data are always known to be a crucial need for training deep models such as transformer-based ones. This issue is emerging more in lower resource languages - like Farsi. We propose *naab*, the biggest cleaned and ready-to-use open-source textual corpus in Farsi. It contains about 130GB of data, 250 million paragraphs, and 15 billion words. The project name is derived from the Farsi word ناب which means pure and high-grade. We also provide the raw version of the corpus called *naab-raw* and an easy-to-use preprocessor that can be employed by those who wanted to make a customized corpus.

1 Introduction

In recent years, Natural Language Processing came into consideration as one of the most competitive fields of Deep Learning. Models in this field including Pre-trained Language Models (PLMs) (Raffel et al., 2020; Devlin et al., 2018) usually need a vast amount of data. These huge textual data typically called corpora are crucial for fine-tuning such models on a language for the first time. The process of fine-tuning a deep neural network model for a language is too time and energy-consuming that having a huge open corpus for a language can be a big help for researchers in this domain.

Due to the lack of a huge amount of text data in lower resource languages - like Farsi - researchers working on these languages were always finding it hard to start to fine-tune such models. This phenomenon can lead to a situation in which the golden opportunity for fine-tuning models is just in hands of a few companies or countries. This can contributes to the weakening of open science.

The last biggest cleaned merged textual corpus (persiannlp, 2020) in Farsi is a 70GB cleaned text corpus from a compilation of 8 (Common Crawl - fa (Crawl, 2019), Miras Text (miras tech, 2020), W2C – Web to Corpus (Majliš, 2011), Persian Wikipedia (persiannlp, 2020), Leipzig Corpora (Biemann et al., 2007), VOA corpus (Dehdari, 2008), Persian poems corpus (Ghaderi, 2019), TEP: Tehran English-Persian parallel corpus (Tiedemann, 2012)) big data sets that have been cleaned and can be downloaded directly.

On the other side, several toolkits tried to ease the NLP-related process (such as fine-tuning huge models) not only because of making it possible for all to gain knowledge and experience of such work but also as a contribution to open science. To name one we can refer to the most popular one which has been written in Python programming language, Transformers (Wolf et al., 2020) which has been widely used to train and fine-tune transformer-based models in this field. The hugging face came with other libraries which are highly integrated with each other.

One of the other Python libraries from the Hugging face is the *datasets* (Lhoest et al., 2021). Corpora that are pushed to *datasets* are easily accessible for all NLP researchers as open-source datasets. Unfortunately, none of the mentioned data sets in Farsi is on the *datasets*.

One of the first challenges that an NLP researcher would face is data preprocessing. Textual corpora are mainly built upon web-crawled data. As result, they contain undesirable text and also personal information. As discussed in (Huang et al., 2022), personal information can be extracted from PLMs through simple queries and attacks, and a convenient method of stopping this leakage is via preprocessing. The conventional methods suggest

---

[*] Corresponding author

Cleaned Corpus Name	Size(GB)	# paragraphs	# words	words/paragraph
Persian NLP	67	13,287,678	7,618,898,575	573.38
OSCAR-fa	36	60,099,393	4,193,005,807	69.76
AGP	23	141,912,688	2,776,681,752	19.56
LSCP	2.3	15,205,432	269,097,323	17.69
Telegram	0.9	6,471,586	100,253,032	15.49
Total	129.2	236,976,777	14,957,936,489	63.12

Table 1: Some statistics about the used corpora

using a trimming approach in which you should look for patterns to be removed (Raffel et al., 2020; Farahani et al., 2021). These methods usually are computationally expensive and also too memory-consuming. In this paper, we propose a streaming pipeline for preprocessing Farsi texts which is vastly simpler than the trimming method.

Our solution to all discussed issues is called naab. The project name is derived from the Farsi word ناب which means pure/high-grade (Abadis, 2022). It provides 126GB (including more than 224 million sequences and nearly 15 billion words) as the training set and 2.3GB (including nearly 11 million sequences and nearly 300 million words) as the test set. Our main contributions to this project are as follows:

- Proposing the largest raw-text corpus in Farsi (*naab-raw*)

- Proposing the largest clean textual corpus in Farsi and making it open source on hugging face data hub easy to use for all (*naab*)

- Proposing an easy-to-use preprocessing approach based on streaming

2 Materials and Methods

In this section, we will elaborate more on some details about our primary materials which have been used during the project, and the methods by which the cleaned version of *naab* is now available open-source.

2.1 Base Corpus

First, we will demonstrate all base corpora that we used within this project. Some statistics including the size of each corpus, number of paragraphs, and words are in Table 1. The number of words in each paragraph distribution would also be informative in some situations, you can see Figure 1 for the histogram. The data distribution regarding each section size on disk is also provided in Figure 2.

2.1.1 Persian NLP

According to (persiannlp, 2020) this corpus includes eight corpora that are sorted based on their size as below. We used a cleaned version of this corpus and re-cleaned it again with our preprocessor 2.2.

- Common Crawl (65GB)

- MirasText (12GB)

- W2C – Web to Corpus (1GB)

- Persian Wikipedia (787MB)

- Leipzig Corpora (424MB)

- VOA corpus (66MB)

- Persian poems corpus (61MB)

- TEP: Tehran English-Persian parallel corpus (33MB)

2.1.2 AGP

This corpus was a formerly private corpus for ASR Gooyesh Pardaz[1] which is now published for all users by this project. This corpus contains more than 140 million paragraphs summed up in 23GB (after cleaning). This corpus is a mixture of both formal and informal paragraphs that are crawled from different websites and/or social media.

2.1.3 OSCAR-fa

OSCAR (Abadji et al., 2022) or Open Super-large Crawled ALMAnaCH coRpus is a huge multilingual corpus obtained by language classification and filtering of the Common Crawl corpus using the go-classy architecture. Data is distributed by language in both original and deduplicated form. We used the *unshuffled-deduplicated-fa* from this corpus, after cleaning there were about 36GB remaining.

2.1.4 Telegram

Telegram, a cloud-based instant messaging service, is a widely used application in Iran. Following this

---

[1]ASR Gooyesh Pardaz Website

(a) Total (Train)

(b) Total Test

(c) Persian NLP
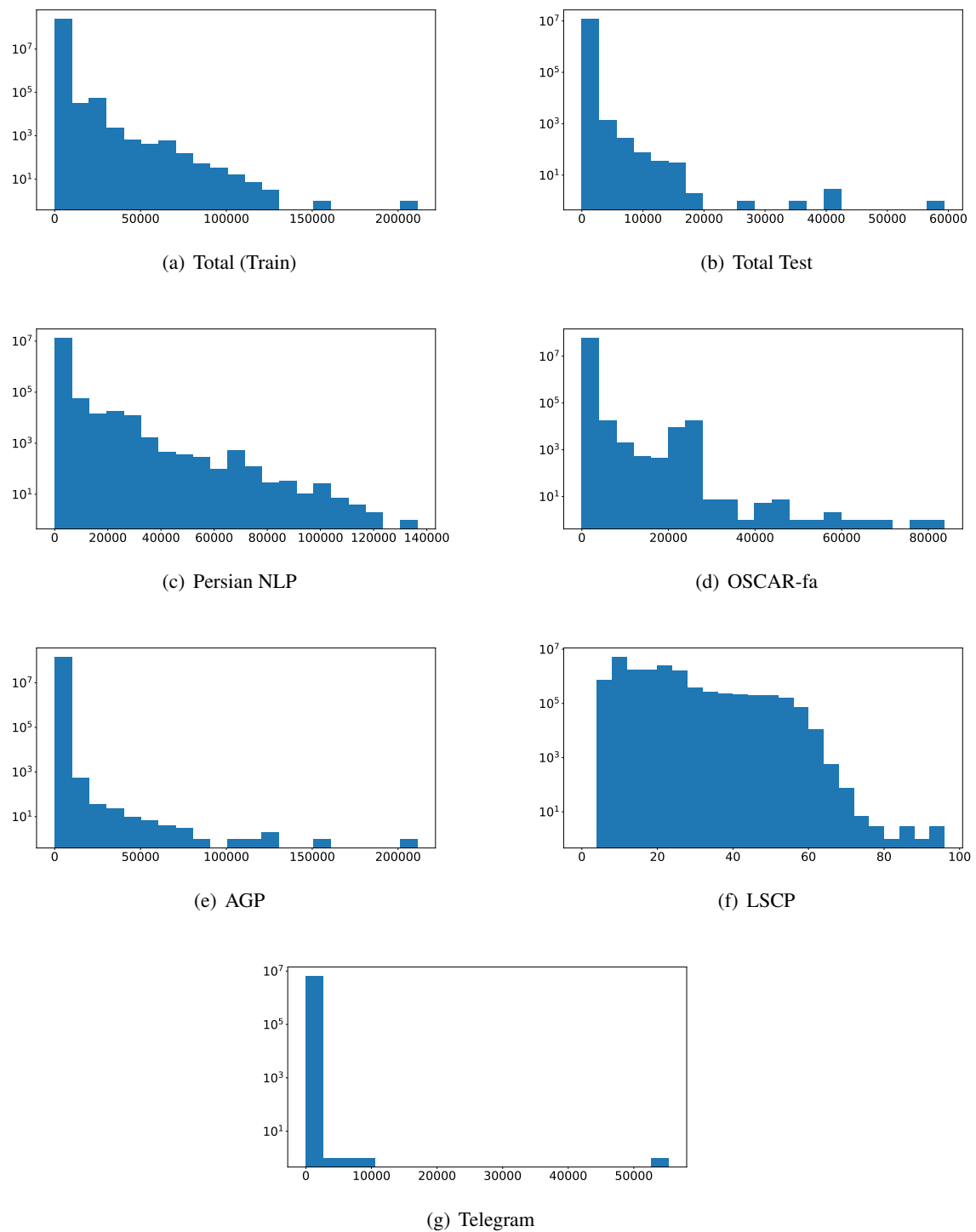
(d) OSCAR-fa

(e) AGP

(f) LSCP

(g) Telegram

Figure 1: **Word per paragraph histogram**: Since we didn't want to emit the outliers - to see the real distribution - we used the log scaled histogram, this approach will make the plots easier to follow. These plots indicate that most informal texts contain lesser words compared with formal texts. The largest paragraph has about 200,000 words in it.

hypothesis, we prepared a list of Telegram channels in Farsi covering various topics including sports, daily news, jokes, movies, entertainment, etc. The textual data extracted from mentioned channels mainly contains informal data. Although small, this data is rich as it contains an up-to-date version of Farsi used in daily life.
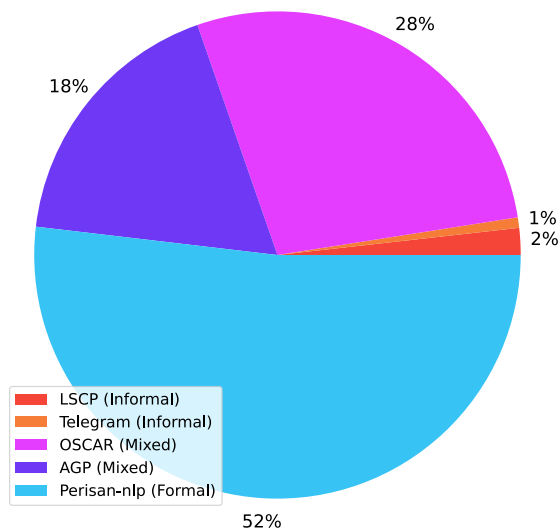
Figure 2: **Corpora sizes pie chart**: It contains both formal and informal text data. This corpus includes cleaned versions of five big corpora. The biggest part of this corpus is from the *Persian-nlp* which is a formal textual corpus. We tried to increase the proportion of informal text in the corpus respected to the formal one by featuring mixed corpora like *AGP* and *OSCAR*.

2.1.5 LSCP

The Large Scale Colloquial Persian Language Understanding dataset (Khojasteh et al., 2020) has about 120M sentences from 27M casual Persian sentences. However, we just used the Farsi part of it and after cleaning we had 2.3GB of it remaining. Since the dataset is casual, it may help our corpus have more informal sentences although its proportion to formal paragraphs is not comparable.

2.2 Preprocess

Our preprocessor script uses Linux kernel tools for cleaning data. This method uses almost no memory and is much faster than the formal methods which use memory for loading the text, matching patterns, and removing them. We tested it on an Intel(R) Xeon(R) CPU E5-2699 v3 @ 2.30GHz system and it preprocesses roughly each 1GB in a minute. The code for it can be easily costumed and is available on Github[2]. This script contains five main parts which are as follows.

2.2.1 Filtering Non-Farsi Words

In this process we just let "proper" words be passed, the "proper" words are defined as follows:

---
[2]Preprocessor script

- All 32 characters of Farsi (ا to ی)
- Some Arabic characters which are ubiquitous in Farsi (like: ﺔ, ﻭَ, ﻭُ, ﻯَ)
- Some symbolic characters (like '.', '?', '-', ',' and their Farsi version)
- '<200c>' which is the half-space in Farsi

2.2.2 Unifying Arabic/Farsi Characters

There are lots of texts which use different shapes of characters for a particular character in Farsi although they are inherently the same. Therefore, in this step, we replace the less frequent characters with their alternative. For more details, you can check Table 2.

To be substituted	Alternative
ي ا ىَ	ى
ة ا ةَ	ه
ك	ک
إ	ا
رَ	ر
وَ	و

Table 2: Substitution list of characters to their alternative

2.2.3 Unifying Spaces

After all of these preprocesses it'd be better if we unify all spaces with one.

2.2.4 Removing Empty Lines

There could be several lines that became empty after these steps. So in this step, we will remove empty lines.

2.2.5 Removing Short Lines

MIN_NUMBER_OF_TOKENS is the name of a variable in the preprocessor script which controls the minimum number of words (split by space) in each line. In the final step, we remove lines with less than *MIN_NUMBER_OF_TOKENS* words.

3 Results

We released two versions of our corpus which are as follows:

3.1 *naab-raw*

The raw version of our corpus is simply a compilation of former textual corpus plus our newly

published corpus called *naab-raw*. Thanks to the *datasets* we could upload our part and link to other corpora easily. Thus one who wants to clean his/her corpus from scratch can access this corpus from SLPL/naab-raw [3]. Feel free to customize our pre-process code 2.2 in a way that fits your needs.

3.2 *naab*

The cleaned version of the corpus which is called *naab* is a ready-to-use corpus that you can easily download through *datasets* library with some simple commands[4]. You can work with it completely in a plug-and-play mode. You can even download parts of it - thanks to Hugging face - rather than the whole corpus to train/fine-tune your model on part of it. The corpus is pushed to the hub and is available SLPL/naab[5].

4 Usage

This corpus can be used for self-supervised training of Language Models (LMs) in Farsi. All sorts of LMs such as n-grams and Transformer-based ones(like BERT, BART, T5 and etc) can be fine-tuned on Farsi easily using libraries proposed by hugging face. Furthermore, naab contains a wide variety of Farsi text including formal and informal, classic and modern, prose and poem, etc. which makes it suitable for linguistic studies.

5 Conclusions

Textual data need is one of the crucial problems for researchers in Farsi. We proposed the biggest open source textual corpus which comes both in cleaned (called *naab*) and raw form (called *naab-raw*). These two corpora are available for all as an open-source dataset in the data hub in hugging face. Also, we proposed a stream based preprocessing for those who wanted to make their own huge text data from scratch.

6 Acknowledgement

References

Abadis. 2022. Naab meaning.

Julien Abadji, Pedro Ortiz Suarez, Laurent Romary, and Benoît Sagot. 2022. Towards a cleaner document-oriented multilingual crawled corpus. *arXiv preprint arXiv:2201.06642*.

Chris Biemann, Gerhard Heyer, Uwe Quasthoff, and Matthias Richter. 2007. The leipzig corpora collection-monolingual corpora of standard size. *Proceedings of Corpus Linguistic*, 2007.

Common Crawl. 2019. Common crawl - farsi.

Jon Dehdari. 2008. Voa news.

Jacob Devlin, Ming-Wei Chang, Kenton Lee, and Kristina Toutanova. 2018. Bert: Pre-training of deep bidirectional transformers for language understanding. *arXiv preprint arXiv:1810.04805*.

Mehrdad Farahani, Mohammad Gharachorloo, Marzieh Farahani, and Mohammad Manthouri. 2021. Parsbert: Transformer-based model for persian language understanding. *Neural Processing Letters*, 53(6):3831–3847.

Amin Ghaderi. 2019. Persian poems corpus.

Jie Huang, Hanyin Shao, and Kevin Chen-Chuan Chang. 2022. Are large pre-trained language models leaking your personal information? *arXiv preprint arXiv:2205.12628*.

Hadi Abdi Khojasteh, Ebrahim Ansari, and Mahdi Bohlouli. 2020. Lscp: Enhanced large scale colloquial persian language understanding. *arXiv preprint arXiv:2003.06499*.

Quentin Lhoest, Albert Villanova del Moral, Yacine Jernite, Abhishek Thakur, Patrick von Platen, Suraj Patil, Julien Chaumond, Mariama Drame, Julien Plu, Lewis Tunstall, Joe Davison, Mario Šaško, Gunjan Chhablani, Bhavitvya Malik, Simon Brandeis, Teven Le Scao, Victor Sanh, Canwen Xu, Nicolas Patry, Angelina McMillan-Major, Philipp Schmid, Sylvain Gugger, Clément Delangue, Théo Matussière, Lysandre Debut, Stas Bekman, Pierric Cistac, Thibault Goehringer, Victor Mustar, François Lagunas, Alexander Rush, and Thomas Wolf. 2021. Datasets: A community library for natural language processing. In *Proceedings of the 2021 Conference on Empirical Methods in Natural Language Processing: System Demonstrations*, pages 175–184, Online and Punta Cana, Dominican Republic. Association for Computational Linguistics.

---

[3] https://huggingface.co/datasets/SLPL/naab-raw

[4] Refer to the dataset card for gaining more information.

[5] https://huggingface.co/datasets/SLPL/naab

Martin Majliš. 2011. W2c–web to corpus–corpora. *Proceedings of Corpus Linguistic*.

miras tech. 2020. Mirastext.

persiannlp. 2020. persian-raw-text.

Colin Raffel, Noam Shazeer, Adam Roberts, Katherine Lee, Sharan Narang, Michael Matena, Yanqi Zhou, Wei Li, Peter J Liu, et al. 2020. Exploring the limits of transfer learning with a unified text-to-text transformer. *J. Mach. Learn. Res.*, 21(140):1–67.

Jörg Tiedemann. 2012. Parallel data, tools and interfaces in opus. In *Proceedings of the Eight International Conference on Language Resources and Evaluation (LREC'12)*, Istanbul, Turkey. European Language Resources Association (ELRA).

Thomas Wolf, Lysandre Debut, Victor Sanh, Julien Chaumond, Clement Delangue, Anthony Moi, Pierric Cistac, Tim Rault, Rémi Louf, Morgan Funtowicz, et al. 2020. Transformers: State-of-the-art natural language processing. In *Proceedings of the 2020 conference on empirical methods in natural language processing: system demonstrations*, pages 38–45.