ICNLSP 2022

Proceedings of the 5th International Conference on Natural Language and Speech Processing

16–17 December, 2022 (virtual)

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Introduction

Welcome to the 5th International Conference on Natural Language and Speech Processing (ICNLSP 2022), held online on December 16th, 17th 2022.

ICNLSP is the right choice to select as a forum for researchers, students, and also for industrials to exchange ideas and discuss research and trends in the field of Natural Language Processing, and also to publish their results in the field. As examples of companies present during the conference, we mention here, Mercedes Benz (Germany), and Vail Systems company (USA), and Elm (KSA) and many others.

The program committee accepted 37 papers (long and short ones) which is around 40% of the received submissions (from 31 countries). The accepted papers are of good quality thanks to the high-quality level of the reviews done by the program committee members. All papers have been presented orally, that is why the program was quite long. Various topics of NLP are discussed, as Semantics, language modelling, text classification, speech recognition, information extraction, natural language understanding, etc.

As it is mentioned in the program of the conference, there are three keynotes. The first one was presented by Prof. Eric Laporte from Gustave Eiffel University (France), who exposed his thoughts about hybrid natural language processing in the deep learning era. The second one, dealing with an interesting and challenging topic, was given by Dr. Ahmed Ali from Qatar Computing Research Institute (Qatar), entitled "Multilingual and Code-Switching Speech Recognition". The third talk was programmed to be presented by Prof. Jan Niehues, from Karlsruhe Institute of Technology (Germany), and entitled "Plug-and-Play Abilities for Neural Machine Translation". We will be happy to make all the talks and presentations available on the website of the conference.

We hope readers enjoy reading the content of the 5^{th} ICNLSP proceedings. We would like also to invite them to check the proceedings of the past versions of ICNLSP:

Mourad Abbas, Abed Alhakim Freihat, Proceedings of the Fourth International Conference on Natural Language and Speech Processing (ICNLSP 2021), 12-13 November 2021, Association for Computational Linguistics, https://aclanthology.org/2021.icnlsp-1

Mourad Abbas, Abed Alhakim Freihat, Proceedings of the 3rd International Conference on Natural Language and Speech Processing (ICNLSP 2019), 12-13 September 2019, Association for Computational Linguistics, https://aclanthology.org/volumes/W19-74/

Mourad Abbas, Proceedings of the 2nd International Conference on Natural Language and Speech Processing (ICNLSP 2018), 25-26 April 2018, IEEE, https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8374402

Mourad Abbas, Ahmed Abdelali, Proceedings of the 1st International Conference on Natural Language and Speech Processing, Procedia Computer Science, 128, Elsevier. https://www.sciencedirect.com/journal/procedia-computer-science/vol/128

We would like to express our gratitude to the organizing and the program committees for making this event a success.

Mourad Abbas and Abed Alhakim Freihat

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Invited Speakers:

Prof. Eric Laporte, Gustave Eiffel University, France
Dr. Ahmed Ali, Qatar Computing Research Institute, Qatar
Prof Jan Niehues, Karlsruhe Institute of Technology, Germany

Invited Talks

Hybrid natural language processing in the deep learning era

Prof. Eric Laporte, Gustave Eiffel University, France

In this talk, we examine critically the current wave of interest in pure deep learning for natural language processing. What can symbolic resources do for natural language processing? Among other examples, we take into account the languages with more restricted graphical delimitation than English. Then we discuss the foreseeable future of the synergy between machine learning and symbolic resources: are the goals of formalisation, precision, reliability, adaptability within reach for linguistic data?

Multilingual and Code-Switching Speech Recognition

Dr. Ahmed Ali, Qatar Computing Research Institute, Qatar

The prevalence of code-switching (CS) in spoken content has enforced automatic speech recognition (ASR) systems to handle mixed input. Yet, designing a CS-ASR has many challenges, mainly due to the data scarcity, grammatical structure complexity and mismatch along with unbalanced language usage distribution. Our CS will feature both intersentential (switching between-utterances) and intrasentential (within utterances). The evaluation of the designed system and the analysis of the phenomena will be driven based on real test cases, collected from real meetings and interviews.

We show our results on investigating novel techniques to build practical large vocabulary continuous speech recognition systems capable of dealing with both monolingual and code-switching spoken utterances. We study data augmentation and state of the art modelling techniques to address the lack of balanced transcribed CS data. Moreover, we investigate various challenges of evaluating code-switching ASR output. Finally, we highlight our effort in understanding where/why CS happens in speech analysis for system/human code-switching points.

Plug-and-Play Abilities for Neural Machine Translation

Prof Jan Niehues, Karlsruhe Institute of Technology, Germany

Advances in neural machine translation have led to impressive results and broad areas of application. Using multitask learning, these models have even abilities to process different input and generate a variety of output languages. However, this progress is often backed by millions of training examples. In order to cover the approximately 7000 languages in the words, it is essential to not only generalize to unseen examples, but also to unseen tasks. Therefore, we need to recombine the abilities of NMT systems to process and generate different languages in a plug-and-play fashion.

In this presentation, we will investigate two use cases: translating zero-shot directions in multilingual machine translation and end-to-end speech translation. First, we will dissect the challenges in the zero-shot condition. Motivated by the findings, we will present several methods to promote the possibility to combine the different abilities of an NMT system in order to perform unseen tasks. Finally, we will discuss the effect of the presented ideas on multi-lingual machine translation and speech translation.

Table of Contents