Hello,

Welcome to the Fall 2021 Newsletter of SwissNLP. Stay tuned to see recent developments, hot topics, and new major players in the NLP world. We would also like to use this opportunity to welcome our new members to the association.

What happened since the previous SwissNLP Newsletter

SwissText Conference 2021

The 6th edition of SwissText took place from 14 to 16 June 2021 as an online conference. The conference was organized by the Swiss Association for Natural Language Processing (SwissNLP) in collaboration with the University of Applied Sciences and Arts Northwestern Switzerland (FHNW) as well as the Zurich
University of Applied Sciences (ZHAW) and the data innovation alliance. There were 136 attendees from Switzerland, Germany, India, and six other countries.

The Keynote speakers this year were

- Lucia Specia (Imperial College London) - Multimodal Simultaneous Machine Translation
- Lewis Tunstall (Hugging Face) - A Guided Tour Through the Transformers Landscape
- Zenodia Charpy and Adam Grzywaczewski (Nvidia) - From research to production — Enabling real world applications with Conversational AI
- Sebastian Welter (Accenture) - Why AI is not enough anymore

This is the second year that the conference took place online due to the COVID-19 restrictions. Videos of the keynotes, as well as the proceedings of the main conference and shared tasks are now available online here:

What’s next?

The preparations for the next, 7th edition of SwissText have already started. So far the conference is planned to return in an offline format and is scheduled to take place in beautiful Lugano from 8 to 10 June 2022, hosted by the University of Applied Sciences and Arts of Southern Switzerland (SUPSI).

- General Chairs: Roberto Mastropietro (SUPSI), Mark Cieliebak (ZHAW)
- Program Chair: Fabio Rinaldi (IDSIA USI/SUPSI)
- Workshop Chair: Daniele Puccinelli (SUPSI)

Swiss Dialect Collection: «Battle of the Cantons»

By joint effort of ZHAW, FHNW, SwissNLP, as well as AXA Insurance, the research project **Swiss Dialect Collection** was launched in spring of this year. The aim of the project is to collect 2'000 hours of recordings of Swiss German speech. To do this, a web application is used that allows volunteer users to create and review audio recordings.
An extensive marketing campaign has been organized to draw citizens' attention to the project. Several Swiss celebrities were involved, who supported the project and shared information about it in their social media channels.

Campaign «Battle of the Cantons» was started in mid-June as part of the Swiss Dialect Collection. As part of this campaign, two contests were organized – the Battle of the Cantons, where the Swiss cantons competed, and a contest between individual users.

The winners of the campaign «Battle of the Cantons» were announced on 28 August and awarded with prizes, among which a smartphone and a helicopter flight around Matterhorn. Thanks to the participants from 22 cantons of Switzerland, around 200 hours of recordings were collected as of now. This data, combined with already existing data, has already been used to develop the first system for speech-to-text, which translates Swiss German audio to Standard German text.

The project is still open to all those willing to contribute. The project team does not rule out that new campaigns will be introduced in the future to draw residents' attention to the project.

Learn more about the project
ZHAW launches the Centre of Artificial Intelligence (CAI)

In the spring of this year, the Zurich University of Applied Sciences (ZHAW) launched the Centre of Artificial Intelligence (CAI), which aims to advance AI research in Switzerland.

Alongside offering courses in both BSc and MSc programs, CAI is collaborating with industry partners on a variety of AI-related topics: NLP, autonomous learning systems, computer vision, and many more.

New Major Players

In this section we’d like to introduce you to new major players in the NLP world, who help to increase the accessibility of NLP resources.

Hugging Face

Hugging Face is an NLP startup that offers an open-source library of a wide range of pre-trained transformer models and various other resources. At the moment, the company enjoys enormous popularity, with their

Weights & Biases

Weights & Biases offers a hosted service that can be used by machine learning companies and teams to visualize and track their models’ performance. The sharing feature allows all members of
library being used in production by a thousand companies worldwide. The team access to the information. Accounts for academic teams and individual accounts are offered free of charge.

**Hot Topics**

**Megatron–Turing Natural Language Generation Model (MT–NLG)**

In our previous Newsletter we were talking about OpenAI’s GTP-3 model. As of May 2020 it was the largest neural network ever trained. This spot is now occupied by a 105-layer transformer-based Megatron–Turing Natural Language Generation model (MT–NLG). With 530 billion parameters, this DeepSpeed- and Megatron-powered model by Microsoft and NVIDIA is now the most powerful transformer language model to date. Currently, MT–NLG has a status of a research project and has not yet been released as a commercial product.

To understand how scaling up LMs strengthens their zero-shot or few-shot learning capabilities, Microsoft and NVIDIA performed an evaluation of MT–NLG in eight tasks from five areas of NLP:

- Text prediction
- Reading comprehension
- Commonsense reasoning
- Natural language inference
- Word sense disambiguation

Detailed information and the results can be found [here](#).

**Reflections on the MT–NLG**

The trend to train large LMs seems to be continuing and leaderboards get updated with impressive new scores with each new and bigger model. The Akronymicon keeps track of these developments. However, while their table lists the compute power needed to train the models, it is missing a column for estimates on carbon footprint and training costs.
Facebook AI’s HuBERT

In summer 2021 Facebook AI introduced Hidden Unit BERT (HuBERT), their new approach for learning self-supervised speech representations. HuBERT was inspired by Facebook AI’s DeepCluster method for self-supervised visual learning.

One of the limitations of self-supervised techniques for speech recognition HuBERT aims to alleviate is the richness of lexical and non-lexical information in audio, such as speaker information on one hand (e.g. speaker identity, emotion, hesitation, interruptions, etc.), and on the other hand noise in the speech signal.

What can HuBERT be used for?

According to Facebook, the quality of HuBERT’s learned representations facilitates easy deployment to different speech applications. One of the instances where such a model could be helpful is in the development of NLP systems that could rely solely on audio data for training rather than on textual data. Additionally, HuBERT may be used to enrich generated AI voice assistants’ speech with nuances of real human speech. This also means that HuBERT can assist in improving coverage of spoken-only dialects and languages.

Reflections on the MT–NLG

After the mind-boggling and ingenious approaches to unsupervised machine translation and unsupervised speech recognition, Facebook AI has now found a method for generating useful speech representations without the need for textual transcripts of recorded speech which is one of the major resource bottlenecks in developing AI for speech.

We hope you found something interesting for you in this newsletter. Please contact us in case you:

- would like to share an open position,
- have some open questions regarding the newsletter,
- have suggestions or critics on this newsletter.

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