



# Customer facing AI - Automatic Speech Recognition for conversational spoken Norwegian

Speech and language technology, in particular automatic speech recognition (ASR), has contributed significantly to the general development of artificial intelligence (AI) and machine learning (ML). Conversational and colloquial dialect speech pose major challenges for speech technology in general, and for the Norwegian language particularly, despite the impressive progress in recent years. The importance of language technology, including speech recognition, has been highlighted by the [Norwegian government's AI strategy document](#) and by the EU in [AI: A European Perspective](#).

At the society level, high quality spoken language technology for Norwegian will strengthen the Norwegian language, enable efficient digitalization, simplify interfaces to public services for citizens, and provide invaluable assistance for people with special needs, to name a few important impact areas.

For Telenor, having access to high quality ASR in Norwegian implies that, given customer consent, we could automatically transcribe interactions such as customer service phone conversations into text. Though text is still considered unstructured data, it is much more structured than voice, and it allows for classification and analysis of topics and sentiments, among other insightful information. This is what the Telenor Norway project "Reason to Contact" (RTC) aims to do.

The recent leaps in speech technology performance are largely due to the evolution of deep learning combined with the availability of massive amounts of speech and language data and high-performance computational resources. Yet, for many real-life situations, current technology is not sufficiently advanced to be truly useful. Issues like spontaneous and conversational speech, ambient noise and overlapping speech cause unresolved problems for current speech technology. More importantly, transcription data on spontaneous, conversational speech in Norwegian is a scarce resource.

To alleviate the issues mentioned above and attempt to provide a high-quality Norwegian transcriber, Telenor Research collaborates on the one hand with Telenor Norway for obtaining speech data, and on the other hand with external partners to produce advances in speech and language technologies through research.

During 2020, Telenor Research delivered a proof of concept with a small sample of Telenor Norway's customer service speech data, showing that it is possible to produce decent quality and meaningful transcriptions for this very challenging type of data. But we didn't stop there, our senior researchers Pablo Ortiz and Knut Kvale continue to work on it and currently collaborate in the [SCRIBE project](#) funded by the Norwegian Research Council for the period 2021-2025. The consortium is composed of NTNU, Norwegian Open AI Lab, NRK, National Library of Norway and Telenor. The SCRIBE project aims to study and develop solutions for automatic machine transcription of Norwegian conversational speech in realistic recording conditions. In particular, the project pays special attention to dialect variations and the exploitation of semantic and contextual information to produce meaningful transcriptions.



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