

# Voice messages over LoRa networks

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**Prerequisites:** - Good knowledge of LoRa and embedded programming  
(as from Internet of Things Module)

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**Level:** This topic is appropriate for Master Students

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**Language:** German or English

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## INTRODUCTION

LoRa networks are gaining popularity in the IoT world and are also considered for space applications, like Mars habitats. These applications require also short voice messages to be sent over LoRa, which is obviously a hard challenge because of the limited bandwidth of LoRa. However, voice messages can be also automatically converted into text messages and then sent over LoRa much more efficiently. This project targets to implement and evaluate this idea with respect to its practical usability, e.g. the delay of the received messages.

## PROJECT DESCRIPTION

The following steps are recommended:

- Perform a research about available libraries and frameworks to automatically transform voice messages into text. Select 2-3 of the most promising ones.
- Gather a small dataset with voice messages from at least 10 different people and at least 100 messages. A typical voice message should be just 1-2 sentences long. Test the selected tools with this dataset offline (no LoRa communication, no embedded devices)
- Select an embedded platform to work with, depending on the requirements of the selected library/framework from the previous step.
- Implement now a real-time system: with a proper user interface to record a message, transform it to text, and send it over LoRaWAN to a gateway (own or TTN). Measure the delay from recording the message (the end of the message) until the message is fully received at the gateway.
- Document all steps and their results.

## CONTACT

If you are interested in this work, please contact us via mail: [projects@comnets.uni-bremen.de](mailto:projects@comnets.uni-bremen.de)