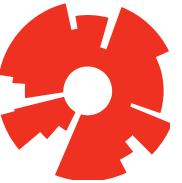


An Open Source Web Reader for Under-Resourced Languages

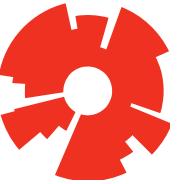
Judy Y. Fong, Þórsteinn Daði Gunnarsson,
Sunneva Þorsteinsdóttir, Gunnar Thor
Örnólfsson, Jón Guðnason





Summary

- Motivation
- Design considerations
- Example TTS API call
- TTS web service
- Álfur and Diljá Voices
- Web Reader User Interface
- Using the Web Reader, Icelandic Example
- Availability
- Thanks and Acknowledgements
- Main Takeaways



Motivation

Language technology is only useful if people use it

Language technology shold be accessible by all

Divorcing Language technology availability from large companies

Goal: Create a tool usable by people for free

Solution: An Open Source Web Reader



Design considerations

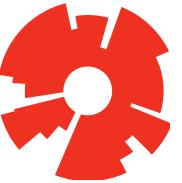
- Usable by all users, including with impaired eyesight
- Embeddable with existing websites
- Open source
- Simple user friendly interface
- Good latency
- Variable text lengths (legal documents are long)
- Focus on Icelandic in the Icelandic market
- Integrate with separate TTS backends



Example TTS API call

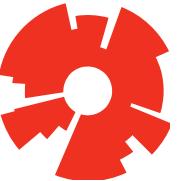
- HTTPS request
- Similar request content across TTS APIs
 - Tiro TTS (Icelandic only)
 - AWS Polly

```
{  
    "Engine": "standard",  
    "LanguageCode": "is-IS",  
    "LexiconNames": [ ],  
    "OutputFormat": "pcm",  
    "SampleRate": "22050",  
    - "SpeechMarkTypes": [  
        "word"  
    ],  
    "Text": "Halló! Ég er gervimaður.",  
    "TextType": "text",  
    "VoiceId": "Alfur"  
}
```



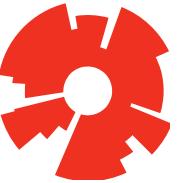
TTS web service

- Tiro TTS web API
 - } HTTP Requests, usable by other apps
 - } SSML for customization
 - } 4 Icelandic voices
 - Karl and Dora
 - } Made a decade ago
 - Álfur and Diljá
 - } New from Talrómur Icelandic TTS dataset
<http://hdl.handle.net/20.500.12537/104>



Álfur and Diljá Voices

- 1st Iteration
- FastSpeech2 implementation by ming024 adapted for Icelandic
 - } MelGAN Vocoder
 - } Sequitur G2P for phonetic transcriptions
 - } Naive text normalization
 - } Problems producing single word utterances
 - } Published on Icelandic CLARIN
- 2nd Iteration
 - ESPNet FastSpeech2 implementation
 - } Parallel WaveGAN and multi-band MelGAN trained
 - } Abbreviations are expanded
 - } G2P through LSTM encoder-decoder S2S model
 - } Published on HuggingFace

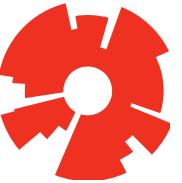


Web Reader User Interface

The screenshot shows a dark-themed web reader interface. At the top, there is a horizontal control bar containing five icons: a play/pause button, a stop button, a speedometer icon, and a settings gear icon. Below the control bar, the main content area displays a block of Chinese text. The text discusses the history of North America, mentioning its size, geographical features, and the discovery by Columbus. It also notes the alternative route through Russia and the permanent settlement by Europeans.

美國佔北美洲一大片，東臨大西洋，西至太平洋。大概 12,000 年前第一個人嚟到呢片大陸嘅。佢可能係經由俄羅斯去到阿拉斯加。1492年，哥倫布航海發現呢片大陸，跟住歐洲人就嚟呢度定居。

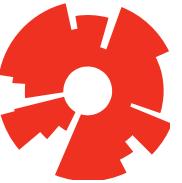
Play/Listen, Stop, Speed (speedometer), & Settings Buttons



Using the Web Reader, Icelandic Example

The screenshot shows a dark grey header bar at the top and bottom of the slide. In the center is a white rectangular area containing a navigation bar with icons for back, forward, search, and settings. Below the bar is a block of Icelandic text:

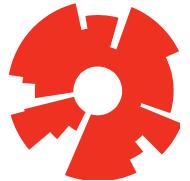
Til að velja lestrarhraðann er smellt á hraðamælinn og hraðinn minnkaður allt niður í helming eða aukinn allt upp í tvöfalt. Síðan er smellt á stillingarhnappinn (tannhjólið) til að sérsniða hlustunarupplifunina og til að læra meira um WebRICE.



Availability

The code base and documentation are available on github under Apache 2.0:
<https://github.com/cadia-lvl/WebRICE>

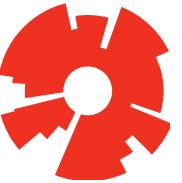
Make TTS for the people, not just researchers



Thanks and Acknowledgements

Funding from the Language Technology programme for Icelandic 2019-2022





Main Takeaways

The code base and documentation are available on github under Apache 2.0:
<https://github.com/cadia-lvl/WebRICE>

Email: webrice@ru.is

Adding web readers to websites embeds under-resourced languages in daily use, in this example, Icelandic

Future work

Browser Plugins: Chrome, Edge/Chromium Based, Firefox

Wordpress plugin

More TTS APIs and voices, in browser and companies

Features: highlighting, volume control, extensive SSML support, streaming