

# Developing speech-recognition technologies for minority languages

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# Timeline, outputs and finance for Welsh

Date	Funder	Recipient	Amount	Project	Outputs for Welsh	Licencing
<b>Late 1990s</b>	UK Research Councils	Briony Williams, Edinburgh University	Unknown	Research on speech datasets and synthesis for Welsh	Description of Welsh phonetics, letter-to-sound rules	N/A
<b>2003-2006</b>	Interreg Wales/Ireland and Welsh Language Board	Bangor University / Trinity College Dublin (with participation from UCD and DCU)	€600K (for both Wales and Ireland)	Welsh and Irish Speech Processing Resources (WISPR), funded by Interreg Wales/Ireland programme	Basic, reusable speech technology resources and Welsh diphone text to speech voices	Open (BSD)
<b>2008-2009</b>	Welsh Language Board	Bangor University	£50K	Initial Welsh speech recognition	Speech recordings, annotations, acoustic models	Open (BSD)
<b>2009</b>	Welsh Government (Education Department)	RNIB Cymru – subcontracted to Ivona	£80K	Natural sounding voices for text to speech	Gwyneth and Geraint Welsh TTS voices	Proprietary (bought by Amazon 2013) with free educational licencing
<b>2013-214</b>	Welsh Government and S4C	Bangor University	£70K	GALLU (Further Welsh speech recognition)	Improved speech resources, app for collecting speech corpus, program for voice control of a robotic arm	Open (BSD)
<b>2015-2016</b>	Welsh Government and S4C	Bangor University	£50K	Infrastructure for Welsh Language Communication	Report on APIs for speech command systems, command and control demonstrator, initial transcription prototype	Open (BSD)

# PALDARUO APP

**HELP US DEVELOP WELSH LANGUAGE SPEECH RECOGNITION.  
CONTRIBUTE YOUR VOICE THROUGH OUR 'PALDARUO' APP**

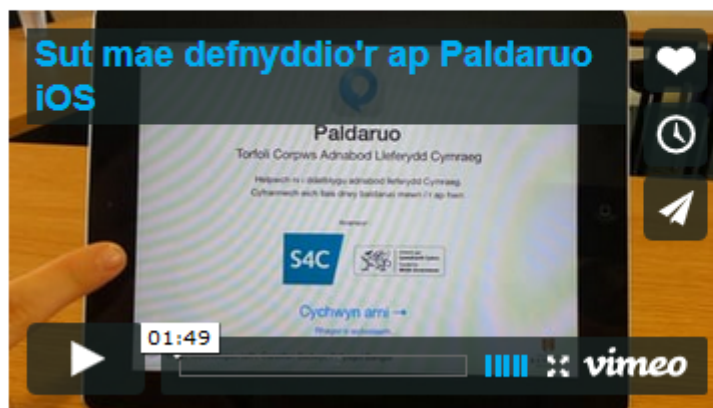


[iTunes](#)

[Google Play](#)

To collect the Welsh speech corpus, crowdsourcing will be used to recruit people from all ages and geographical background to read a script out loud in Welsh.

A specialised app (Paldaruo) has been developed for iOS and Android mobile phones and tablets to collect the data. The app will be available soon in the individual AppStores. Here's a video to give an idea of how to use the app:









THE RESOURCES ▾

TRANSLATION ▾

SPEECH ▾

CLOUD ▾

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BLOG ▾

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## Speech

Resources to produce or respond to Welsh language human speech

### WHAT KIND OF RESOURCES?

The Language Technologies Portal consists of a wide range of resources for the Welsh language, including Welsh language text processing, spelling and grammar checking, translation, text to speech and lots more.

In addition there is support in the form of tutorials and demo projects

### FOR WHO?

The resources are useful to a number of projects and Welsh language software developed by :

- children
- teachers
- website, apps and games developers
- academic researchers

### LATEST FROM THE BLOG

More Welsh text-to-speech resources on GitHub  
Coding a Welsh language robot  
Moses SMT update  
Machine Translation on Mac OS X  
Thanks!!!  
Welsh language synthetic voice API  
Creating domain-specific Translation Engines





# **Towards a Welsh Language Intelligent Personal Assistant**

**A Brief Study of APIs for Spoken Commands,  
Question and Answer Systems and Text to  
Speech for the Welsh Government**

Stefano Ghazzali

Dewi Bryn Jones

Delyth Prys

October 2015

Language Technologies Unit, Canolfan Bedwyr, Bangor University

<http://techiaith.bangor.ac.uk>



# SWOT Analysis (1)

## **Strengths**

- Cross-border Welsh/Irish cooperation with Interreg funding
- Open BSD style licences help industry and further research
- Stability of linguistic content and data (resources)

## **Weaknesses**

- Stop-start with no strategic overview
- Loss of momentum and of key experts, lack of funding security
- Fast pace of IT development and platforms make earlier work (tools) obsolete



# SWOT Analysis (2)

## Opportunities

- To create a strategic project encompassing other less-resourced languages in a similar socio-economic position
- EU funding available e.g. Interreg Wales/Ireland and Interreg Atlantic
- Our chance to emphasise importance for economic potential of speech technology for our language communities/regions

## Threats

- Imminent change from keyboard/mouse controlled input to voice commands
- Increasing use of the Internet of Things (speech controlled) and information retrieval (speech to speech)
- Exclusion of smaller languages from this brave new world

# Our Vision

A new strategy driving cross-border projects to create speech and language technology resources and tools for the speech communities of the Atlantic seaboard:

- Working with industry, including SMEs to bring economic benefit to our regions
- Providing common **technical platforms** for all our languages
- Providing common **formats / standards / methodologies** to deal with legacy resources for our data and linguistic 'building blocks'
- Providing common **dissemination platforms** for our speech technology
- Providing a common **network, training workshops, exchange program**

TOGETHER WE CAN DO IT!