This course has covered …

- Speaking
- Hearing
- The nature of speech
- Sounds and symbols
- Phonetics
- Phonology
- Prosody

- Signals and spectra
- Sampling
- Waveform processing
- The Fourier and Z transforms
- Filters and linear prediction
- Cepstral analysis
So, what have we learnt?

... about speech

The Speech Chain

Phonetics

[fənetɪks]

[ɪks]

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Phonetics

[ɪks]

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[ɪks]

elision
Phonetics

How to pronounce “th” [θ,ð]

1. PLACE TIP OF TONGUE BEHIND TOP TEETH

2. BREATHE OUT

How to pronounce “th” [θ,ð]
Phonetics

How to pronounce “th” [θ,ð]
Phonetics

How to pronounce “th” [θ,ð]

5. "The Smiths wear thin clothes throughout the winter months"

/ðə smiths weə thin kləʊdz θru:aut ðə wintə mʌnθs/

Phonetics

How to pronounce “th” [θ,ð]

6. CONSULT DENTIST
Consonants carry more information than Vowels

Accents, Dialects & Languages
The Vocal Tract

'Hoover' the seal

What have we learnt?

... about signal processing
Codes & Signals

Speech Coding
Spectral Analysis

Hi, Dr. Elizabeth?
Yeah, uh... I accidentally took the Fourier transform of my cat...
Meow!

What have we learnt?

… about speech processing
Speech Processing Can be Useful
Speech Processing Can be Useful

Introducing Translate for Animals

google.co.uk/translateforanimals

Speech Processing Can be Useful

I was reading about this new portable lie detector that's just come on the market, Bridget. It's called a "Handy Truster".

It detects stress patterns in the voice and can be plugged into a telephone. The thought that someone might be using one on me makes me totally paranoid...

Why, Clive? Do you tell a lot of lies?
ER, NO, OF COURSE NOT, DARLING...
AHEM... NOT TO YOU AT ANY RATE...
BUT, ER, I WAS JUST WONDERING,
YOU WOULDN'T HAVE BOUGHT
SUCH A DEVICE WOULD YOU?

DON'T BE SILLY,
CLIVE... OF COURSE
NOT...

SHE'S LYING...

$129.99
Speech Processing Can be Useful

Voice Stress Analysis

Micro tremors are tiny frequency modulations in the human voice. When a test subject is lying, the automatic, or involuntary nervous system, causes an inaudible increase in the Micro tremor’s frequency. The CVSA detects, measures, and displays changes in the voice frequency.

A state-of-the-art computer processes these voice frequencies and graphically displays a picture of the voice patterns. The CVSA is not restricted to “yes” and “no” answers and is able to analyze accurately, tape recordings of unstructured conversations.

CVSA Outperforms Any Other Method
Speech Processing Can be Useful


Speech Processing can be Difficult
Speech Processing Can be Funny

Speech can be Manipulated

Cher's 'Believe' (Dec 1998) was the first commercial recording to feature the audible side-effects of Antares Auto-tune software.
Speech can be Manipulated

Voice Morphing

Child → Teenager → Adult

Virtual Target Speakers

Source Speaker

Reference Speaker

Incoming Utterance

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Speech can be Manipulated

Downloadable from
http://www.dcs.shef.ac.uk/~roger/downloads.html

Fun Voices

http://www.vintagesynth.com/misc/electrixwarp.php
Voices in TV & Cinema

Prof Moore's Digital Voice Factory

What would you like to do?
- Learn to talk backwards
- Speak like a Dalek
- Have fun with your voice
- Sound like a robot

Press one of the buttons

Downloadable from http://www.dcs.shef.ac.uk/~roger/downloads.html
Singing Speech Synthesis

Microsoft Research

VOCALOID
New Singing Synthesis Technology

VY2

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So, that's it!

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But, don’t forget …

“Speech is the most sophisticated behaviour of the most complex organism in the known universe”
That's All Folks 😊

In closing, let me tell you that never in the universe have I spoken before such an attentive audience.

Thanks & Goodbye

/end gud lak wid jo: fjutʃə kæriəζ/