

## Today's Lecture

Not in  
text

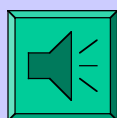
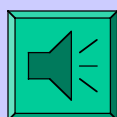
- Administrative:
  - Midterm
  - Assignment 4
- Recurrent nets
  - Nettetalk (continued)
  - Glovetalk
    - video
- Radial basis functions (RBF's)
- Unsupervised learning
  - Kohonen nets

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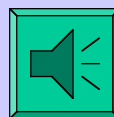
## Example: nettalk

- Learn to read English: output is audio speech

First  
grad  
text,  
before &  
after  
training.



Dictionary  
Text, getting  
progressively  
Better.



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## NETtalk details

Reference: Sejnowski & Rosenberg, 1986, Cognitive Science, 14, pp. 179-211.

Mapped English text to phonemes.

Phonemes then converted to sound by a separate engine.

- 3-layer network trained using backprop
  - 203-80-26 MPL (multi-layer perceptron)
- 203 input units
  - Encoded 7 consecutive characters.
    - window in time before and after the current sound.
    - Alphabet of 26 letters + some punctuation
- 80 hidden units
- 26 output units

29 total input symbols

each represents one “articulatory feature” related to mouth positions/actions (typically 3 per phoneme).

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## Example: glovetalk

- Input: gestures
- Output: speech
- Akin to reading sign language, but HIGHLY simplified.
  - Input is encoded as electrical signals from, essentially, a Nintendo Power Glove.
    - Various joint angles as a function of time.

See Video

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