Advances in Discrete Resonance Spectrogram Analysis

Using the DSR for Source Separation and Sequential Prediction

Nick Harley & Steve Homer

VUB ARTIFICIAL INTELLIGENCE RESEARCH GROUP

TWO STACKED BLOCKS

Upper Block with bullets

- First point **using emphasis**
- Second point *using italics*
- Third point using underline

Lower Block with numbers

1. First point **using emphasis**
2. Second point *using italics*
3. Third point using underline

SINGLE BLOCK WITH HEADINGS

Object Detection and Recognition

First Heading

- First content
- Second content

Second Heading

- First content
- Second content

Third Heading

- First content
- Second content

TWO COLUMN BLOCKS

First Column

Flush left
Flush left

Second Column

Flush right
Flush right

SOURCE SEPARATION TO SEQUENTIAL PREDICTION

Discrete Resonance Spectrogram

TODO: (Insert wide aspect ratio image of DRS)

From Vertical to Horizontal Analysis

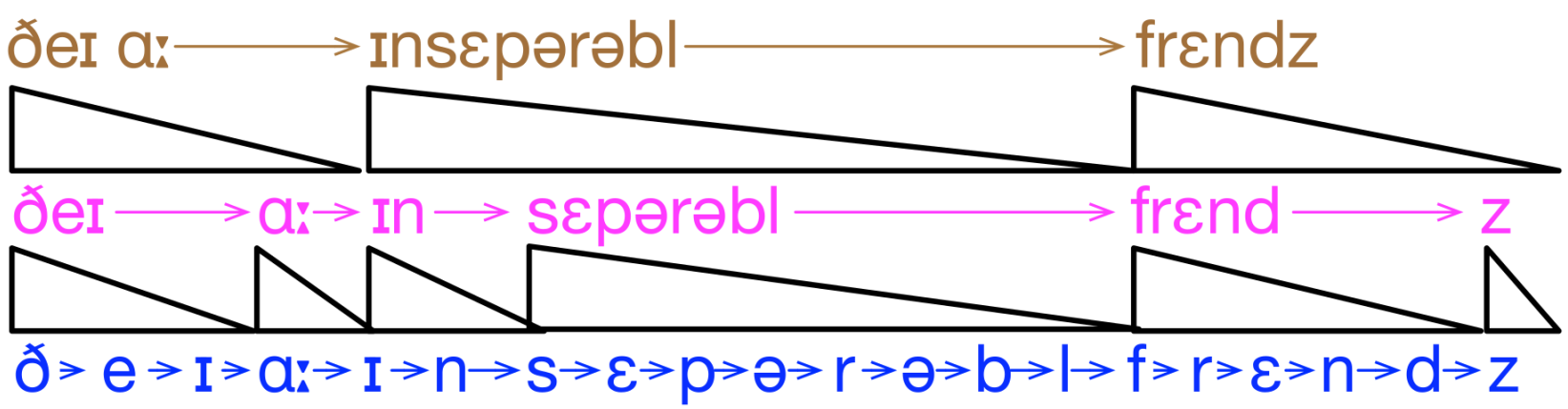
- Source separation looks at dependencies between frequencies **within a slice**, i.e. vertical analysis.
- Temporal correlations can be exploited to observe dependencies **between slices**, i.e. horizontal analysis.

BOUNDARY ENTROPY SEGMENTATION

Boundary Entropy

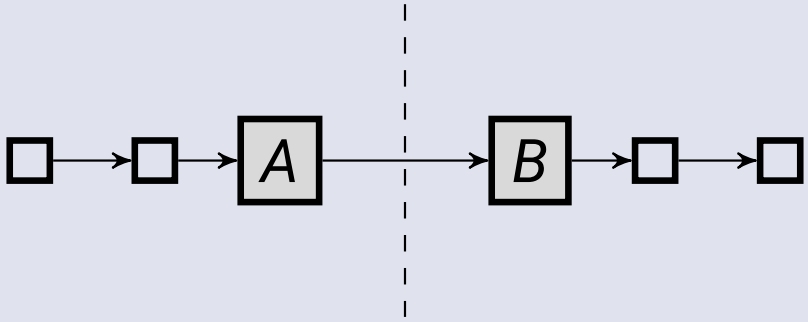
- Intuition
- Unexpectedness
- Uncertainty

Hierarchical Chunking



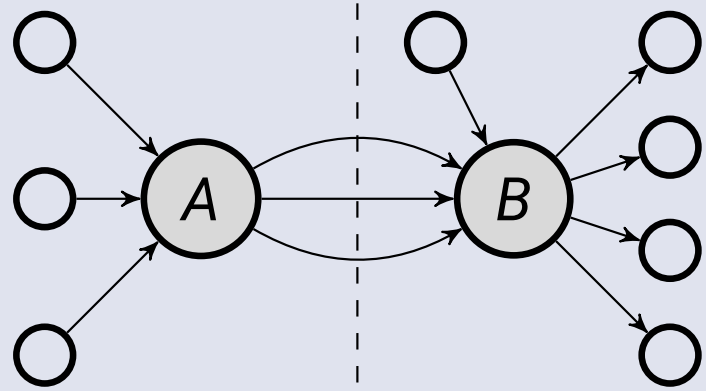
SEQUENCE VS NETWORK INTERPRETATION OF BES

Sequence Interpretation



-
-
-

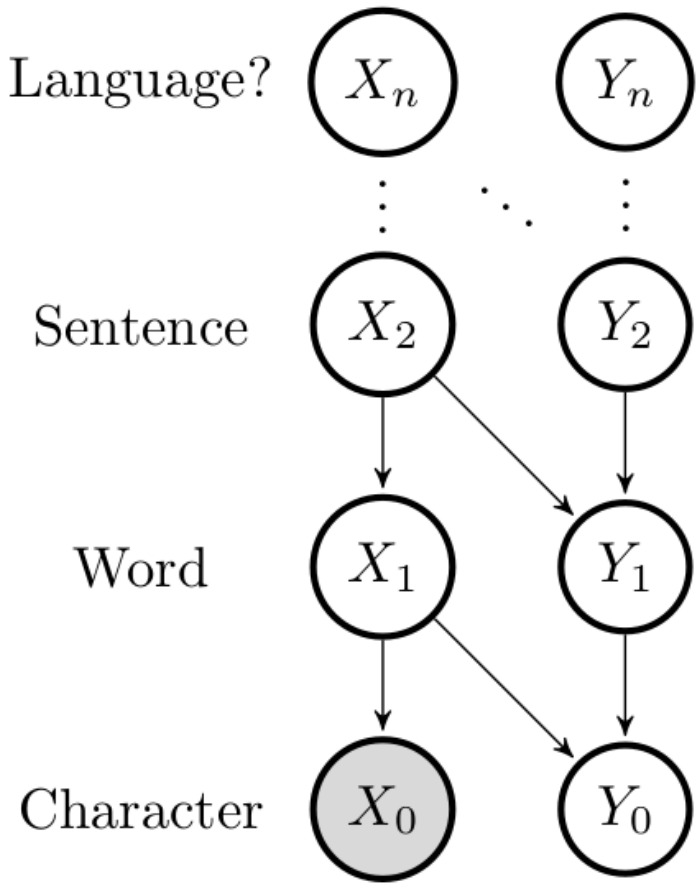
Network Interpretation



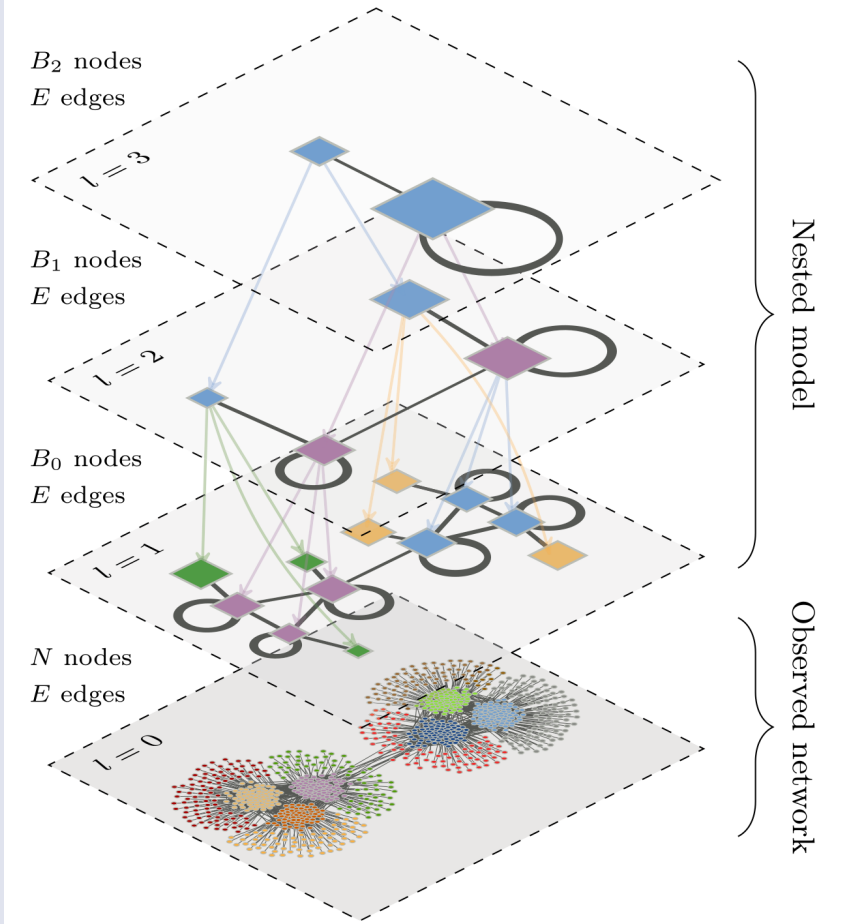
-
-
-

HIERARCHICAL STRUCTURE AND DYNAMICS

Hierarchical Prediction



Hierarchical Structure



MEMORY CONSOLIDATION AND THE MDL PRINCIPLE

What is it?

-
-
-

What does it mean?

-
-
-

PLACEMENT AND NEXT STEPS

Placement

-
-
-

Next Steps

-
-
-

APPLICATIONS AND FUTURE WORK

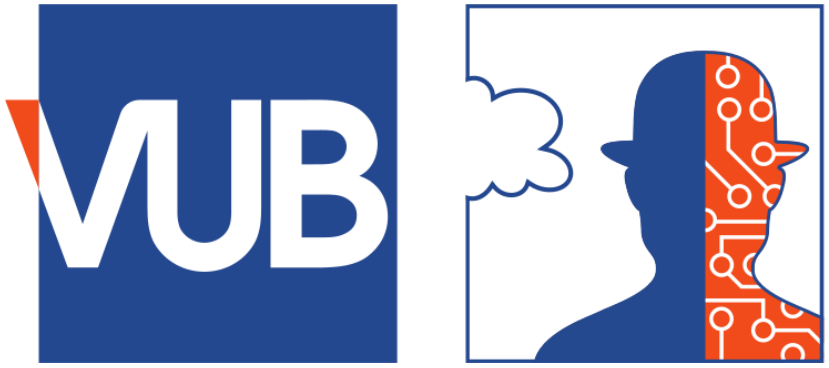
Applications

-
-
-

Future Work

-
-
-

THANK YOU!



ARTIFICIAL
INTELLIGENCE
RESEARCH GROUP

Computational Creativity Lab