Learning (For Claude Shannon) : Elements of structure

Sentence

A statistical parser was used to produce a syntactic dependency analysis of a sentence borrowed from Claude Shannon's famous article "A Mathematical Theory of Communication" (1948). We then used these syntactic dependencies to create a generator akin to distribute movements between arms and legs.

```
The (DT/NN) fundamental (JJ/NN) problem (NN/VB) of (IN/NN) communication (NN/NN) is (VB)
that (IN/VB) of (IN/VB) reproducing (VB/IN)
at (IN/NN) one (CD/NN) point (NN/VB)
either (CC/RB) exactly (RB/NN) or (CC/RB) approximately (RB/RB)
a (DT/NN) message (NN/VB) selected (VB/NN) at (IN/NN) another (DT/NN) point (NN/VB)
```

(`DT`: determiner, `JJ`: adjective, `NN`: noun, `IN`: preposition or subordinating conjunction, `VB`: verb, `CD`: cardinal number, `CC`: coordinating conjunction, `RB`: adverb)

Mouvement atoms

Arms and legs movement atoms are represented by letters that will be associated to each of the eight parts-of-speech in Shannon's statement. These letters correpond to the 24 permutations of the quadruple $(1, 2, 3, 4)$. The numbers 1, 2, 3 and 4 indicate directions in the three anatomical planes (coronal, sagittal, transverse). For each learnt choreographic sequence, eight letters are drawn randomly and assigned to each part-of-speech. This can generate 29,654,190,720 different choreographic sequences.

```
A: 1234 B: 1243 C: 1324 D: 1342
E: 1423 F: 1432 G: 2134 H: 2143
I: 2314 J: 2341 K: 2413 L: 2431
M: 3124 N: 3142 O: 3214 P: 3241
Q: 3412 R: 3421 S: 4123 T: 4132
U: 4213 V: 4231 W: 4312 X: 4321
```

Example of a key

```
[DT: 'I', JJ: 'B', NN: 'K', IN: 'C', VB: 'O', CD: 'E', CC: 'X', RB: 'V']
```

```
-
The (I/K) fundamental (B/K) problem (K/O) of (C/K) communication (K/K) is (O)
that (C/O) of (C/O) reproducing (O/C)
at (C/K) one (E/K) point (K/O)
either (X/V) exactly (V/K) or (X/V) approximately (V/V)
a (I/K) message (K/O) selected (O/K) at (C/K) another (I/K) point (K/O)
-
```

```
arms:
K K O K K -
O O C
K K O
V K V V
K O K K K O
```

```
legs:
I B K C K O
C C O
C E K
X V X V
I K O C I K
```