



det: 1  
pp: 2  
was: 3  
by: 4  
to: 5  
that: 6  
common\_noun: 7  
proper\_noun: 8  
v\_trans\_omissible: 9  
v\_trans\_omissible\_pp: 10  
v\_trans\_not\_omissible: 11  
v\_trans\_not\_omissible\_pp: 12  
v\_cp\_taking: 13  
v\_inf\_taking: 14  
v\_unacc: 15  
v\_unerg: 16  
v\_inf: 17  
v\_dat: 18  
v\_dat\_pp: 19  
v\_unacc\_pp: 20

embed to  
part-of-speech  
and verb-type  
tokens

A scientist lentend a cat a donut \*

np\_det\_seq = [0, 1, 0, 0, 1, 0, 1]  
np\_prop\_seq = [0, 0, 0, 0, 0, 0, 0]  
v\_dat\_seq = [0, 0, 1, 0, 0, 0, 0]  
np\_det\_left\_seq = [1, 0, 0, 1, 0, 1, 0]  
np\_two\_before\_seq = [0, 1, 0, 1, 0, 0, 0]  
np\_before\_seq = [0, 0, 1, 0, 1, 0, 0]  
np\_after\_seq = [0, 0, 1, 0, 0, 1, 0]

In bidirectional Encoder  
of  
Encoder-Decoder  
Transformer  
equivalent model

(A) = (np\_det\_left\_seq & np\_two\_before\_seq) = [0, 0, 0, 1, 0, 0, 0]  
(B) = (np\_prop\_seq & np\_before\_seq) = [0, 0, 0, 0, 0, 0, 0]  
np\_np\_seq = (A or B) = [0, 0, 0, 1, 0, 0, 0]  
np\_np\_any\_before\_seq = [1, 1, 1, 0, 0, 0, 0]  
np\_v\_dat\_p\_np\_np = np\_after\_seq & v\_dat\_seq  
& np\_before\_seq & np\_np\_any\_before\_seq  
= [0, 0, 1, 0, 0, 0, 0]

\*COGS official training data uses "lentend", instead of "lent"