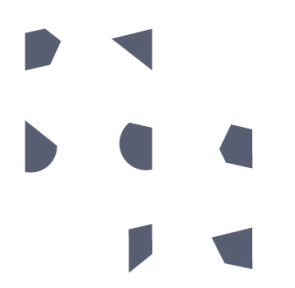


What's wrong with your model?

A Quantitative Analysis of Relation Classification

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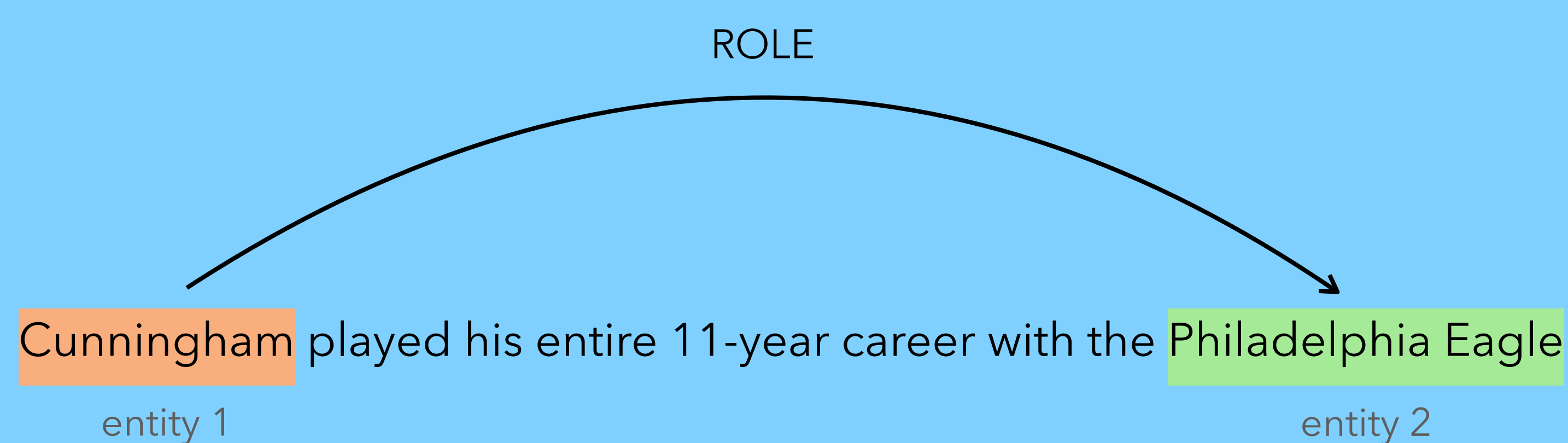


PIONEER
CENTRE
FOR AI

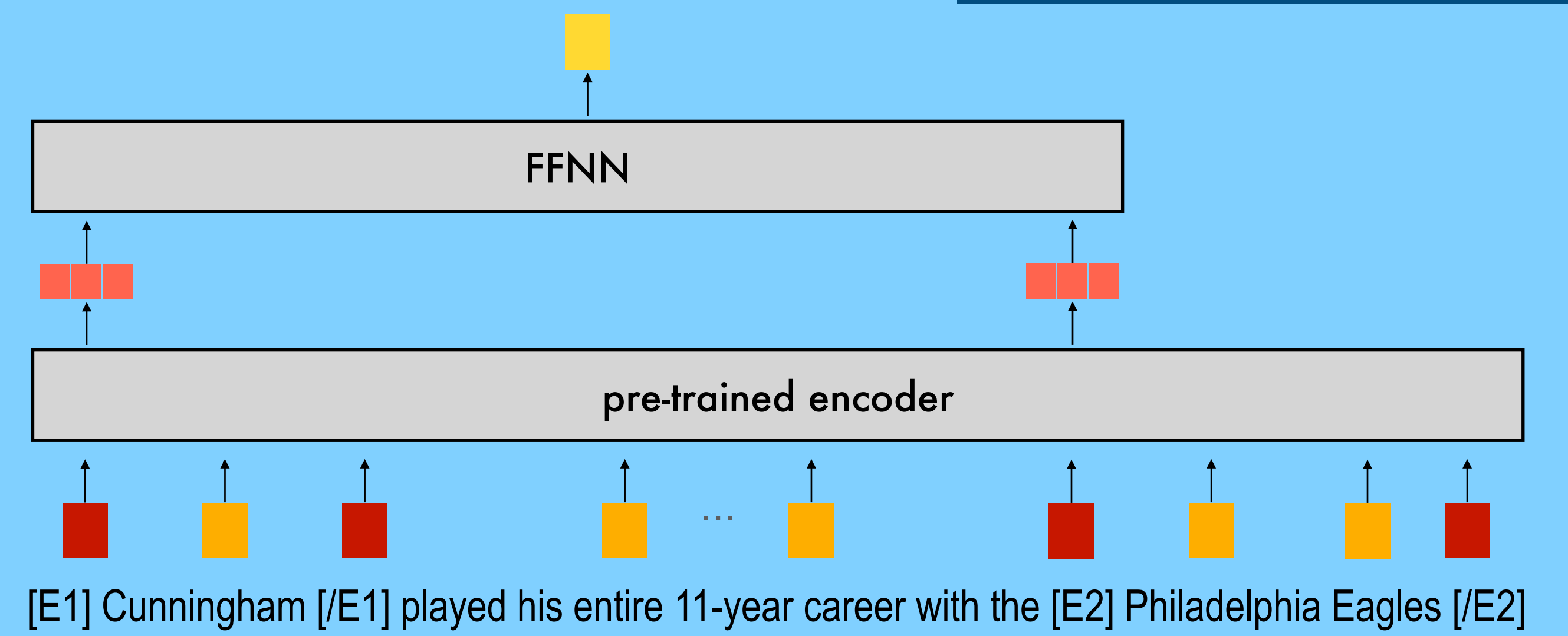
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TASK



MODEL



1. ATTRIBUTES and BUCKETING

Attribute	Description	Value Type		Computation		Level		
		DISCR.	CONT.	LOCAL	AGGR.	ENT.	REL.	SENT.
entity type*	the types of $e1$ and $e2$	✓		✓		✓		
relation type	the type of r	✓		✓			✓	
IV entities	in-vocabulary entities: the amount of entities which appear in the train set (values 0, 1, or 2)	✓		✓		✓		
entity length	the sum of the number of tokens in $e1$ and $e2$		✓	✓		✓		
entity distance	the number of tokens separating $e1$ from $e2$		✓	✓			✓	
sentence length	the number of tokens in s		✓	✓				✓
entity density	the total number of entities in s over the sentence length (in percentage)		✓	✓				✓
relation density	the total number of semantic relations in s over the sentence length (in percentage)		✓	✓				✓
OOV token density	the amount of out-of-vocabulary tokens in s with respect to the train set over the sentence length (in percentage)		✓	✓				✓
entity type frequency*	the frequencies of the types of $e1$ and $e2$ in the train set		✓		✓	✓		
relation type frequency	the frequency of the type of r in the train set		✓		✓		✓	

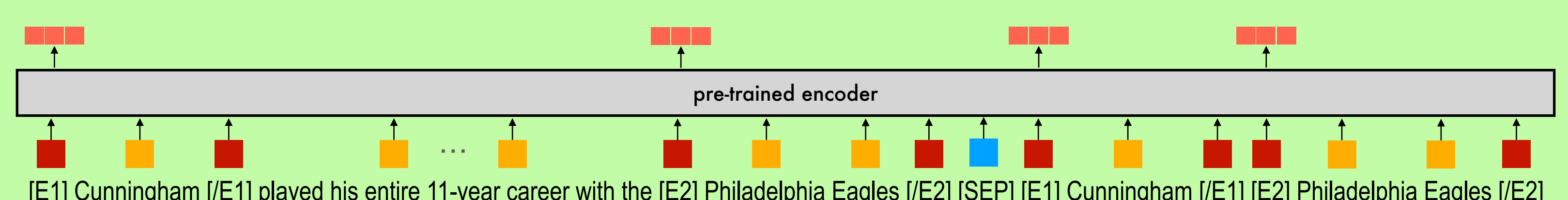
2. CORRELATION ANALYSIS

	IV entities	entity length	entity distance	sentence length	entity density	relation density	OOV token density	entity type freq.	relation type freq.
avg. correl	0.1	0.0	-0.4	0.3	0.1	0.2	0.0	-0.3	0.9
avg. stdev	22.2	7.1	6.1	6.4	7.0	5.9	9.9	14.6	24.9



3. IMPROVEMENT

We target the entity distance attribute and repeat the two entities close to each other at the end of the sentence.



	ai	literature	music	news	politics	science	avg.
baseline	37.2	44.3	41.0	25.4	37.0	35.3	36.7
improvement	40.4	48.9	46.8	24.2	38.2	39.3	39.6