

100

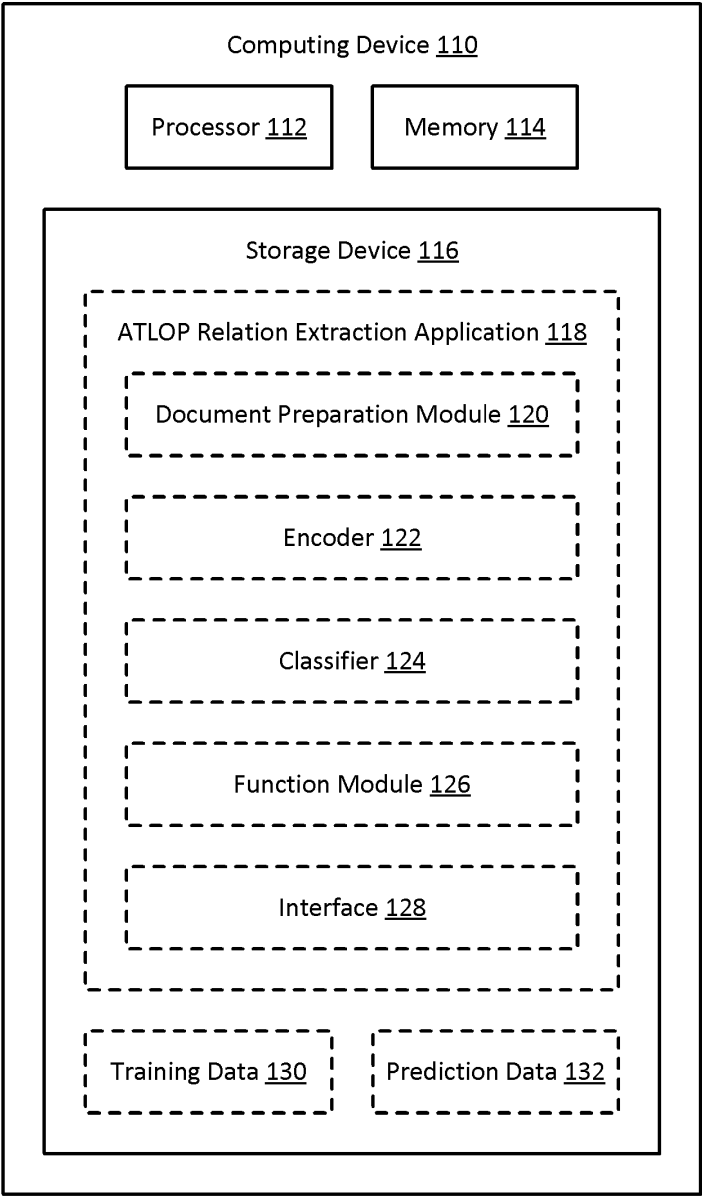


FIG. 1

John Stanistreet was an Australian politician. He was born in **Bendigo** to legal manager **John Jepson Stanistreet** and **Maud McIlroy**. (...4 sentences...) In 1955 **John Stanistreet** was elected to the **Victorian Legislative Assembly** as the **Liberal and Country Party** member for **Bendigo**. **Stanistreet** died in **Bendigo** in 1971.

Subject: **John Stanistreet** **Object:** **Bendigo**

Relation: place of birth; place of death

FIG. 2

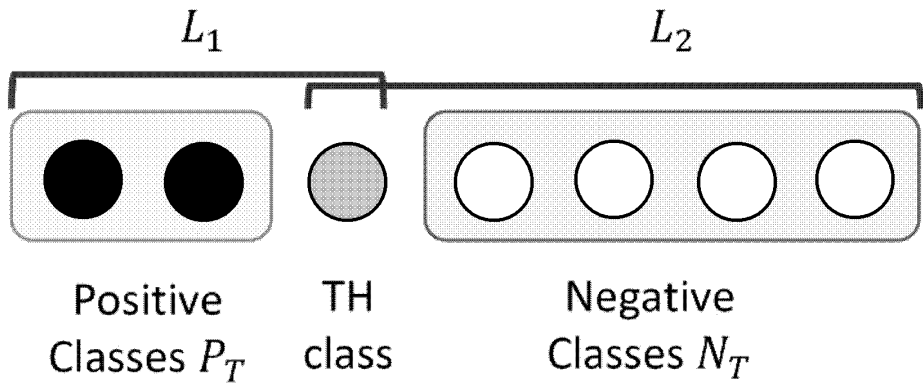


FIG. 3

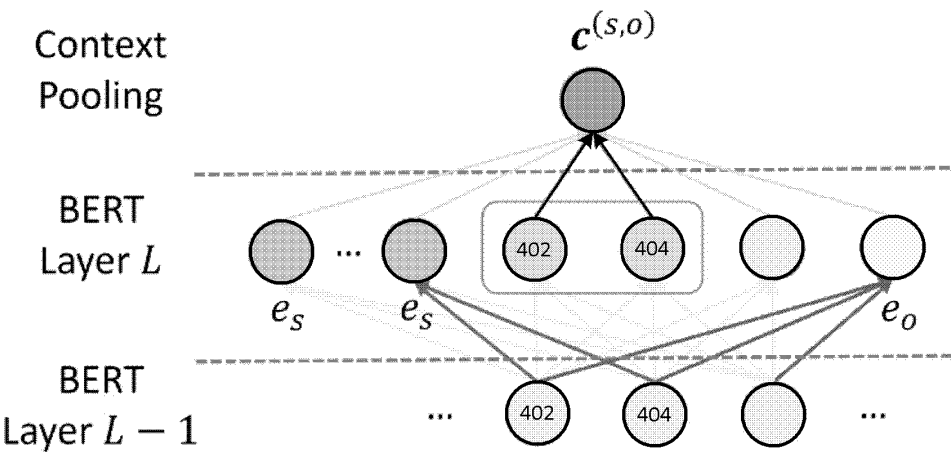


FIG. 4

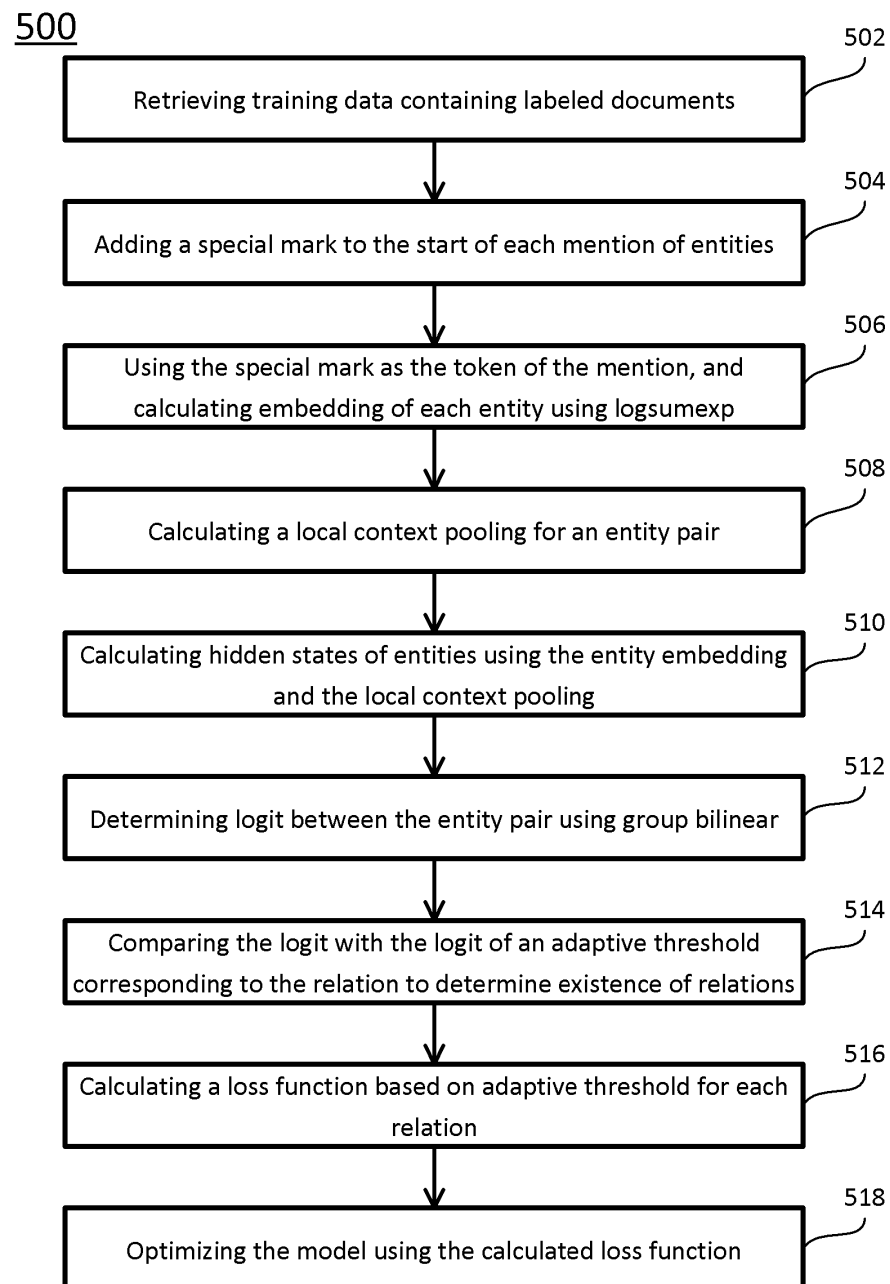


FIG. 5

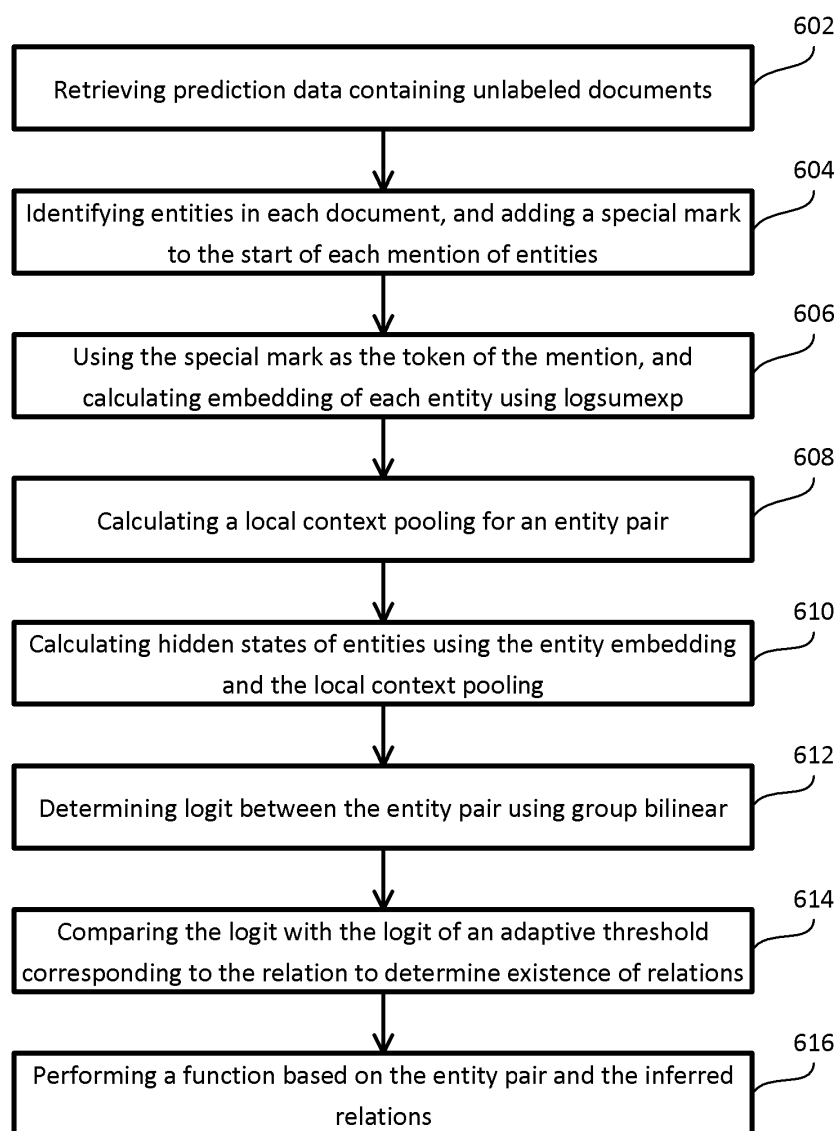
600

FIG. 6

Table 1

Statistics / Dataset	DocRED	CDR	GDA
# Train	3053	500	23353
# Dev	1000	500	5839
# Test	1000	500	1000
# Relations	97	2	2
Avg.# entities per Doc.	19.5	7.6	5.4

FIG. 7

Table 2

Hyperparam / Dataset	DocRED	CDR	GDA
Batch size	4	4	16
# Epoch	30	30	10
Learning rate for encoder	5e-5	5e-5	5e-5
Learning rate for classifier	1e-4	1e-4	1e-4
Group size	64	64	64
Dropout	0.1	0.1	0.1
Gradient clipping	1.0	1.0	1.0

FIG. 8

Table 3

Model	Dev		Test	
	Ign F1	F1	Ign F1	F1
<i>Sequence-based Models</i>				
CNN (Yao et al. 2019)	41.58	43.45	40.33	42.26
BiLSTM (Yao et al. 2019)	48.87	50.94	48.78	51.06
<i>Graph-based Models</i>				
BiLSTM-AGGCN (Guo, Zhang, and Lu 2019)	46.29	52.47	48.89	51.45
BiLSTM-LSR (Nan et al. 2020)	48.82	55.17	52.15	54.18
BERT-LSR _{BASE} (Nan et al. 2020)	52.43	59.00	56.97	59.05
<i>Transformer-based Models</i>				
BERT _{BASE} (Wang et al. 2019a)	-	54.16	-	53.20
BERT-TS _{BASE} (Wang et al. 2019a)	-	54.42	-	53.92
HIN-BERT _{BASE} (Tang et al. 2020a)	54.29	56.31	53.70	55.60
CorefBERT _{BASE} (Ye et al. 2020)	55.32	57.51	54.54	56.96
CorefRoBERTa _{LARGE} (Ye et al. 2020)	57.84	59.93	57.68	59.91
<i>Our Methods</i>				
BERT _{BASE} (our implementation)	54.27±0.28	56.39±0.18		
BERT-E _{BASE}	56.51±0.16	58.52±0.19		
BERT-ATLOP _{BASE}	59.22±0.15	61.09±0.16	59.31	61.30
RoBERTa-ATLOP _{LARGE}	61.32±0.14	63.18±0.19	61.39	63.40

FIG. 9

Table 4

Model	CDR	GDA
BRAN (Verga, Strubell, and McCallum 2018)	62.1	-
CNN (Nguyen and Verspoor 2018)	62.3	-
EoG (Christopoulou, Miwa, and Ananiadou 2019)	63.6	81.5
LSR (Nan et al. 2020)	64.8	82.2
SciBERTBASE (our implementation)	65.1±0.6	82.5±0.3
SciBERT-EBASE	65.9±0.5	83.3±0.3
SciBERT-ATLOPBASE	69.4±1.1	83.9±0.2

FIG. 10

Table 5

Model	Ign <i>F1</i>	<i>F1</i>
BERT-ATLOP _{BASE}	59.22	61.09
— Adaptive Thresholding	58.32	60.20
— Localized Context Pooling	58.19	60.12
— Adaptive-Thresholding Loss	39.52	41.74
BERT-E _{BASE}	56.51	58.52
— Entity Marker	56.22	58.28
— Group Bilinear	55.51	57.54
— Logsumexp Pooling	55.35	57.40

FIG. 11

Table 6

Strategy	Dev F1 Test	F1
Global Thresholding	60.14	60.62
Per-class Thresholding	61.73	60.35
Adaptive Thresholding	61.27	61.30

FIG. 12

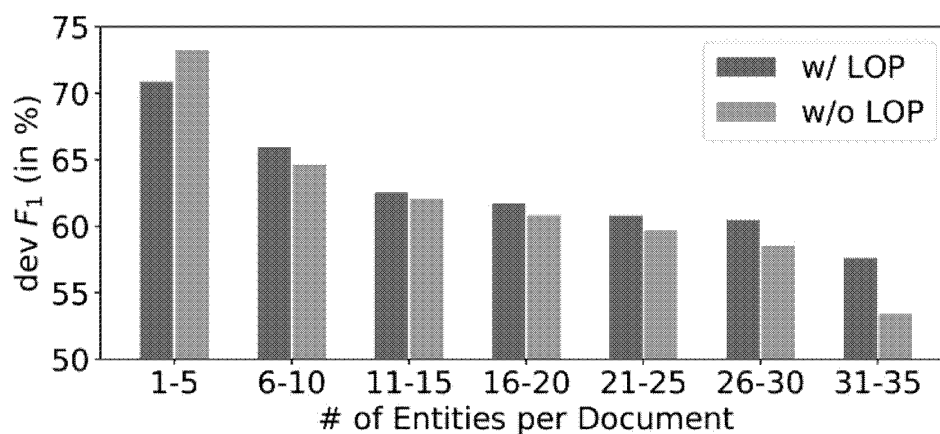


FIG. 13

John Stanistreet was an Australian politician. He was born in Bendigo to legal manager John Jepson Stanistreet and Maud McIlroy. (... 4 sentences ...) In 1955 John Stanistreet was elected to the Victorian Legislative Assembly as the Liberal and Country Party member for Bendigo, but he was defeated in 1958. Stanistreet died in Bendigo in 1971.

Subject: John Stanistreet **Object:** Bendigo

Relation: place of birth; place of death

FIG. 14