

100

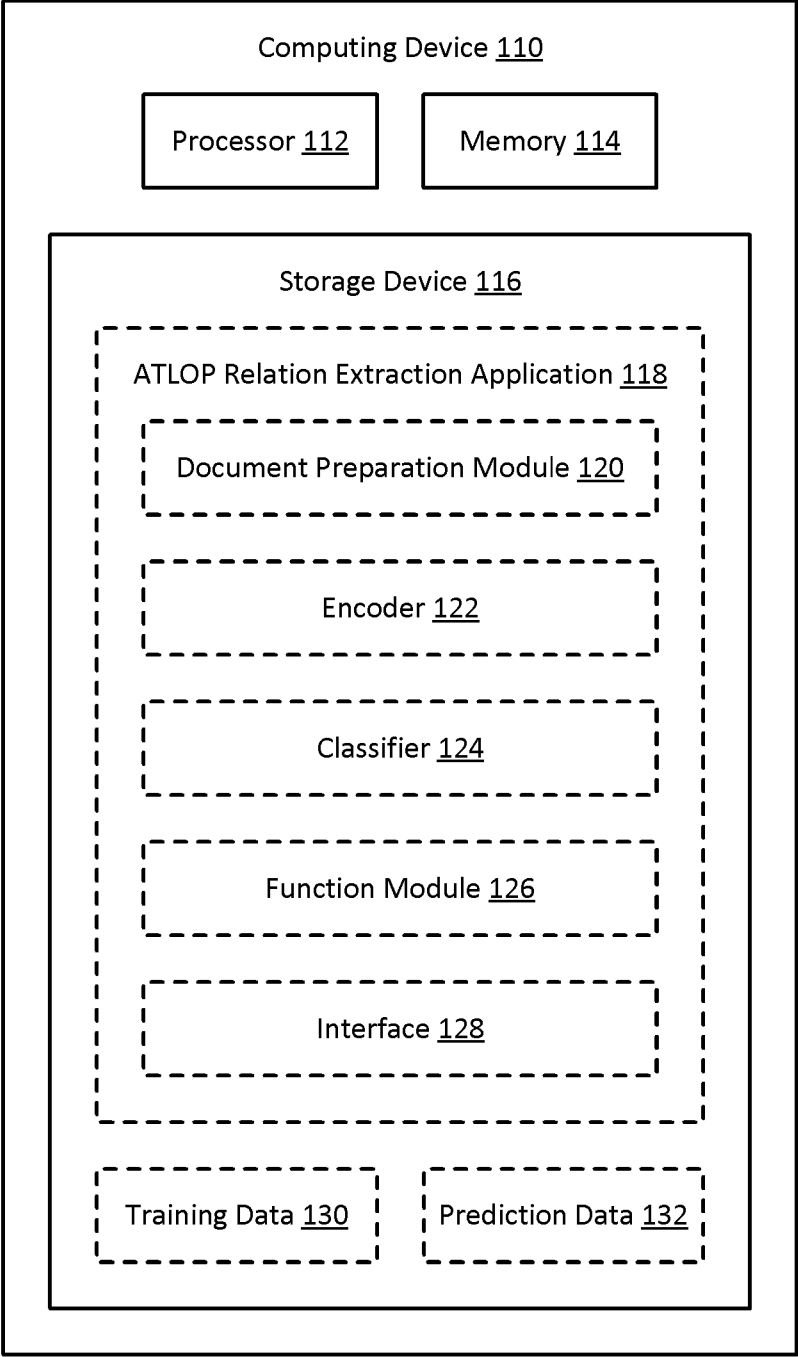


FIG. 1

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

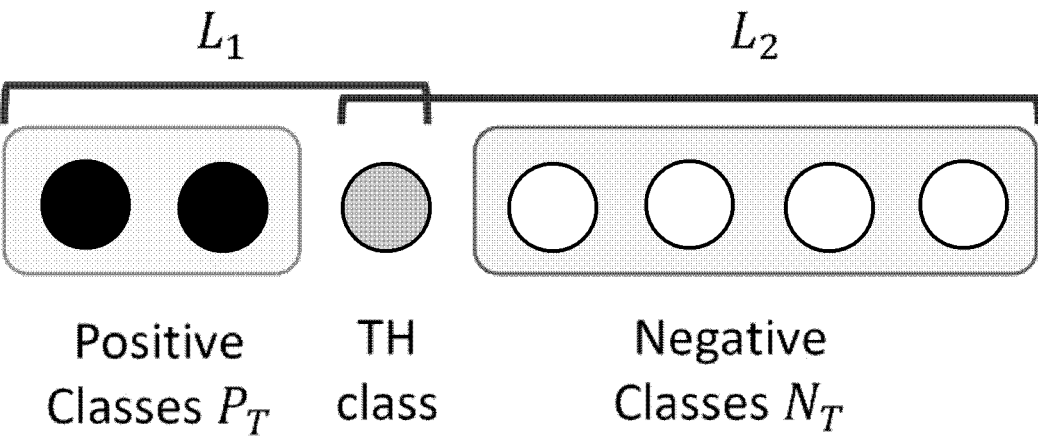


FIG. 3

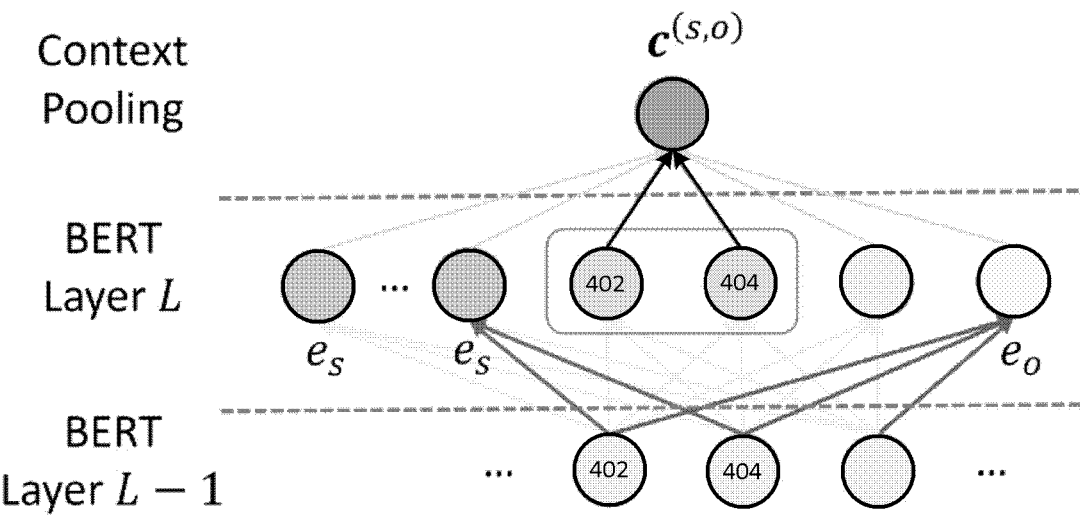


FIG. 4

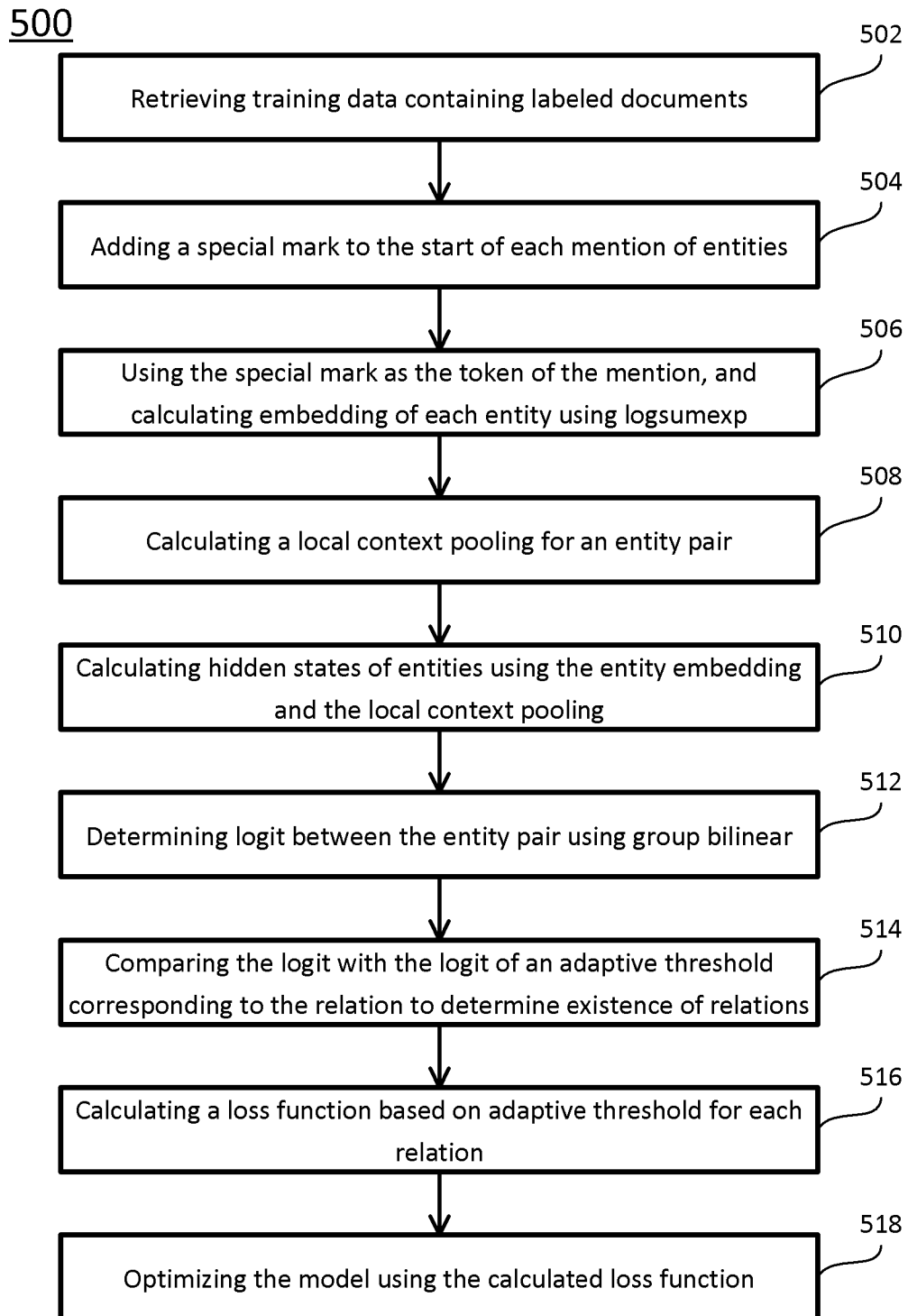


FIG. 5

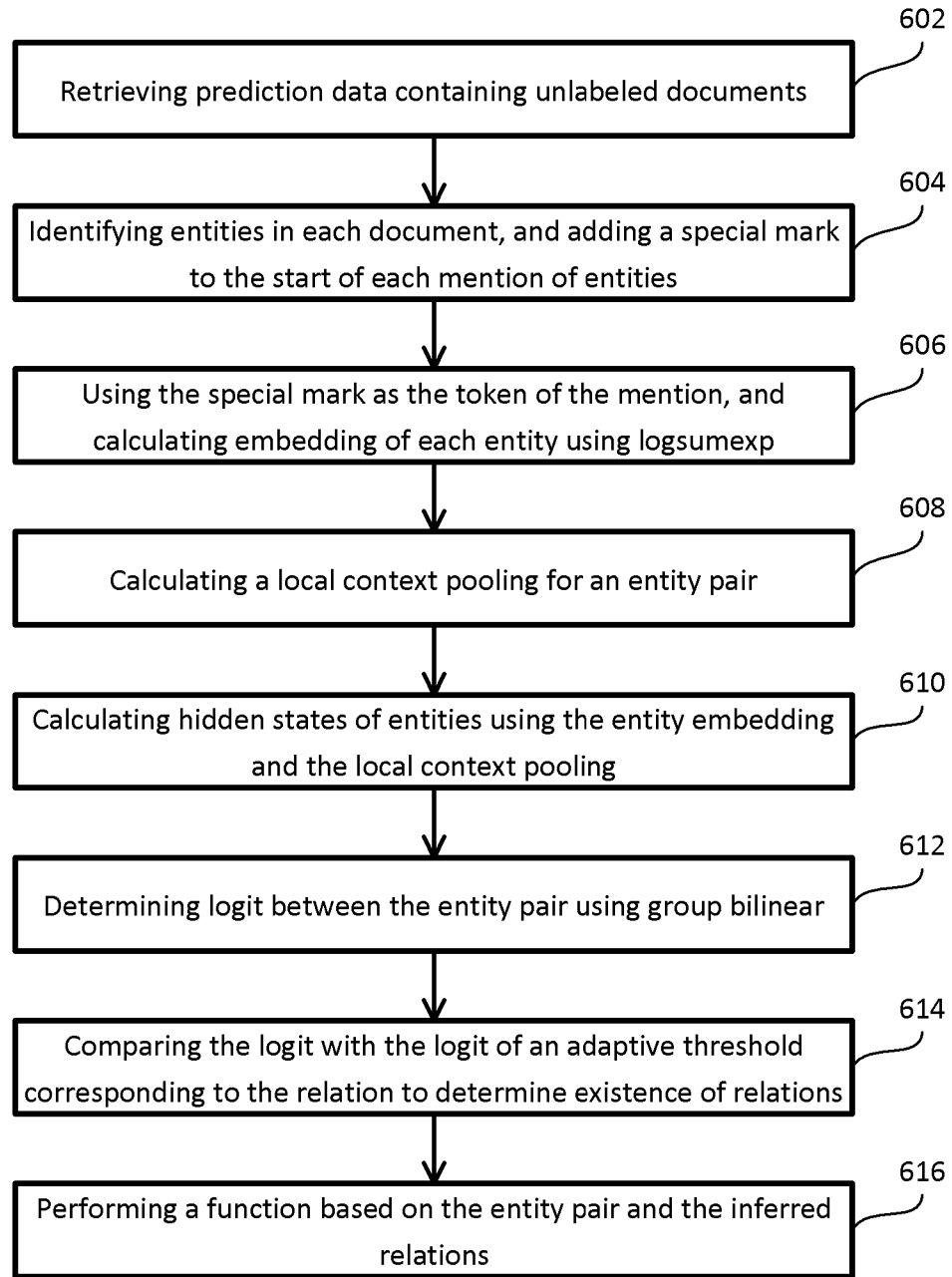
600

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

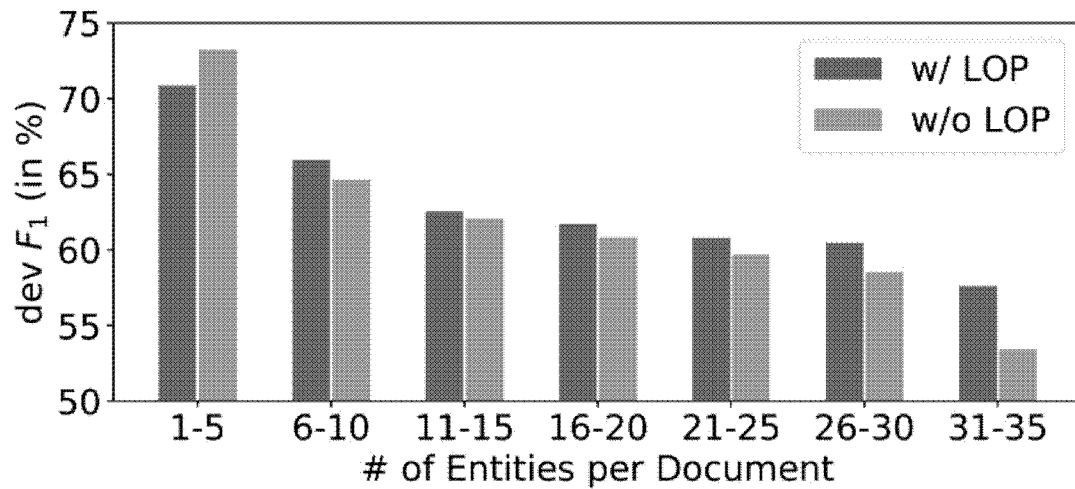


FIG. 13

*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