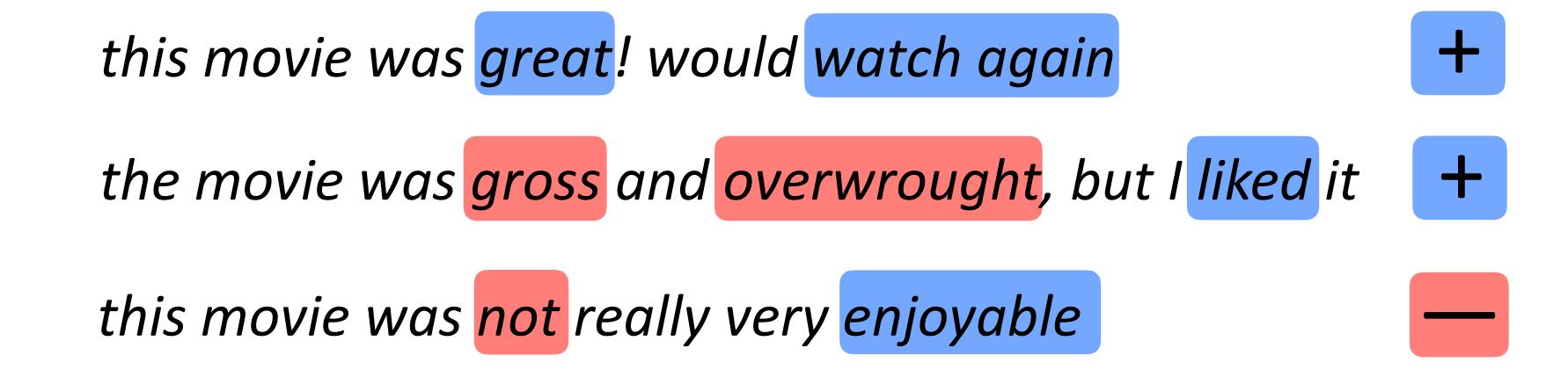


ELMo Tasks: Sentiment



Why are context-dependent embeddings useful here?



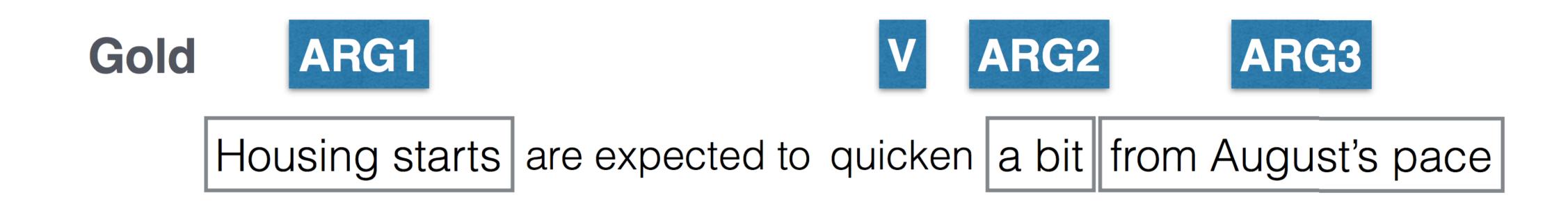
ELMo Tasks: NER



Why are context-sensitive embeddings useful here?



ELMo Tasks: SRL



Identify arguments of the verb

Why are context-dependent embeddings useful here?



| TASK | PREVIOUS SOTA | | OUR BASELINI | ELMO + E BASELINE | INCREASE (ABSOLUTE/ RELATIVE) |
|-------|----------------------|------------------|-----------------|-------------------|-------------------------------|
| SQuAD | Liu et al. (2017) | 84.4 | 81.1 | 85.8 | 4.7 / 24.9% |
| SNLI | Chen et al. (2017) | 88.6 | 88.0 | 88.7 ± 0.17 | 0.7 / 5.8% |
| SRL | He et al. (2017) | 81.7 | 81.4 | 84.6 | 3.2 / 17.2% |
| Coref | Lee et al. (2017) | 67.2 | 67.2 | 70.4 | 3.2 / 9.8% |
| NER | Peters et al. (2017) | 91.93 ± 0.19 | 90.15 | 92.22 ± 0.10 | 2.06 / 21% |
| SST-5 | McCann et al. (2017) | 53.7 | 51.4 | 54.7 ± 0.5 | 3.3 / 6.8% |

- ▶ Training: 1B words of text taken from MT data (news, etc.)
- SST5 = sentiment, SQuAD = QA (coming later)
- Large gains across many tasks



| | Source | Nearest Neighbors | | |
|-------|-------------------------------|---|--|--|
| GloVe | play | playing, game, games, played, players, plays, player, Play, football, multiplayer | | |
| biLM | Chico Ruiz made a spec- | Kieffer, the only junior in the group, was commended | | |
| | tacular play on Alusik 's | for his ability to hit in the clutch, as well as his all-round | | |
| | grounder {} | excellent play. | | |
| | Olivia De Havilland | {} they were actors who had been handed fat roles in | | |
| | signed to do a Broadway | a successful play, and had talent enough to fill the roles | | |
| | <pre>play for Garson {}</pre> | competently, with nice understatement. | | |

Nearest neighbors of words in context



▶ Highly flexible: can use as an embedding layer for nearly any task

Can be big and slow: big LSTMs can suck up GPU memory

Strictly better than word2vec if you can afford it

AllenNLP: calling ELMo is just one line, plenty of models for different tasks built on top of it