EVENT REPRESENTATIONS FOR AUTOMATED STORY GENERATION WITH DEEP NEURAL NETS

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AUTOMATED STORY GENERATION

- Using AI to create new stories

- Rules & Planning → Neural Networks

Talespin (1992):
One day,
JOE WAS THIRSTY .
JOE WANTED   NOT TO BE THIRSTY .
JOE WANTED   TO BE NEAR THE
WATER.

Universe (1984):
>> LIZ tells NEIL she doesn't love him
working on goal – (WORRY-ABOUT NEIL) – using
plan BE-CONCERNED
Possible candidates – MARLENA JULIE DOUG
ROMAN DON CHRIS KAYLA
Using Marlena for WORRIER
>> MARLENA is worried about NEIL

Does this scale?

THE NEED FOR EVENTS

r 2 d 2 carrying some drinks on a tray strapped to his back passes yoda who uses his force powers to hog the drinks

Expected:

obi wan and anakin are drinking happily when chewbacca takes a polaroid picture of anakin and obi wan

Predicted:

can this block gives him the advantage to personally run around with a large stick of cheese

EVENT REPRESENTATION

- From sentence, extract event representation (S, V, DO, M)

- Use our linguistic knowledge to bootstrap the neural network

Example:

Original sentence: yoda uses the force to take apart the platform dooku ventress and grievous are on dropping them as they fall into space and reassemble the platform into the tantive iv which they use to escape the exploding base

Event: yoda use force EmptyParameter

Generalized Event: <NE>0 fit-54.3 power.n.01 EmptyParameter

<NE>0 appear-48.1.1 EmptyParameter EmptyParameter
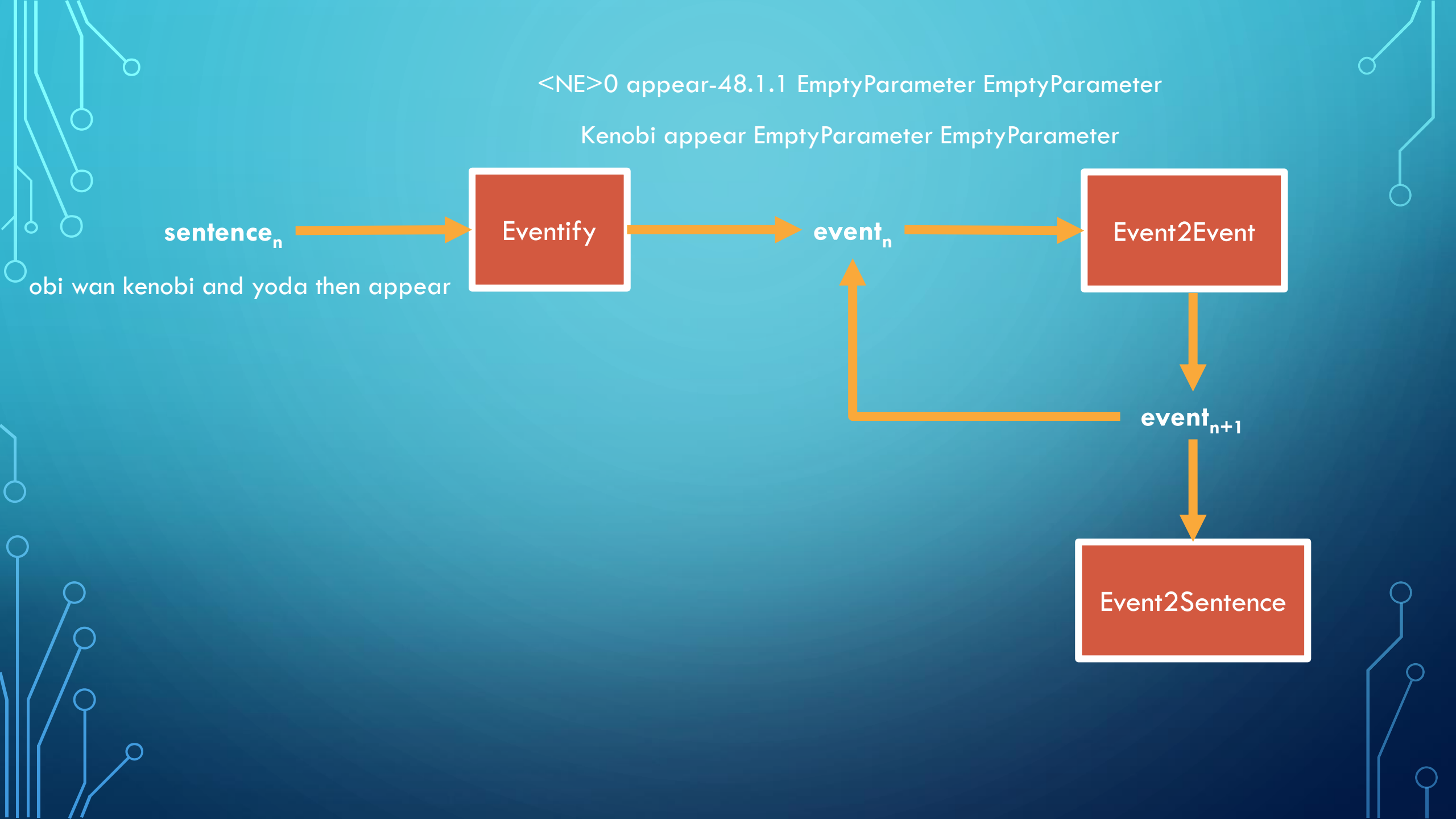
Kenobi appear EmptyParameter EmptyParameter

sentence$_n$ → Eventify → **event$_n$** → Event2Event

obi wan kenobi and yoda then appear

Event2Event → **event$_{n+1}$** → Event2Sentence

EVENT-TO-EVENT

- Different variations on representation → how do they work for predicting next event?

- Original Sentences vs Specific vs Generalized

    +genre

    +bigrams

    +multiple events from one sentence

- Evaluated against the original next event

    - Perplexity

    - BLEU

EXAMPLE

she shake hand princess

Expected: they strike relationship EmptyParameter

Predicted: she become pregnant EmptyParameter

EXAMPLE

female.n.02 amuse-31.1 external_body_part.n.01 leader.n.01

Expected: physical_entity.n.01 amuse-31.1 abstraction.n.06 EmptyParameter

Predicted: <NE>0 transfer_mesg-37.1.1-1-1 female.n.02 conic_section.n.01

RESULTS

Experiment	Perplexity	BLEU
(0) Original Sentences	704.815	0.0432
(1) Original Words Baseline	748.914	**0.1880**
(2) Original Words with <NE>s	166.646	0.1878
(3) Generalized Baseline	**54.231**	0.0575
(4) Generalized, Continued NEs	56.480	0.0544
(5) Generalized + Genre	**48.041**	0.0525
(6) Generalized Bigram	50.636	0.1549
(7) Generalized Bigram, Continued NEs	50.189	**0.1567**
(8) Generalized Multiple, Sequential	58.562	0.0521
(9) Generalized Multiple, Any Order	61.532	0.0405
(10) Generalized Multiple, All to All	**45.223**	0.1091
(11) Generalized Bigram + Genre	48.505	**0.1102**

EVENT-TO-SENTENCE

- Return from generated events to create useable, readable sentences

- Same evaluation

- Producing full or generalized sentences from event representation

As male.n.02 person.n.01 enlisted_person.n.01 skilled_worker.n.01 hangs onto the body_part.n.01 for dear state.n.02 <NE>0 throws male.n.02 lightsaber like a weapon.n.01 which destroys the surface.n.01 s act.n.02 sending entity.n.01 tumbling down .

EXAMPLE

Event: male.n.02 meet-36.3-1 <NE>0 conveyance.n.03

Original: On male.n.02 attribute.n.02 address.n.02 male.n.02 meets the comical <NE>0 on the conveyance.n.03 .

Predicted: When male.n.02 meets <NE>0 on the conveyance.n.03 male.n.02 tells male.n.02 that male.n.02 is not there .

RESULTS

Experiment	Perplexity	BLEU
Original Sentence → Original Sent.	704.815	0.0432
Original Words Event → Original Sent.	909.182	0.0015
Generalized Event → Generalized Sent.	**54.264**	**0.0496**
All Generalized Events → Gen. Sent.	55.312	0.0402
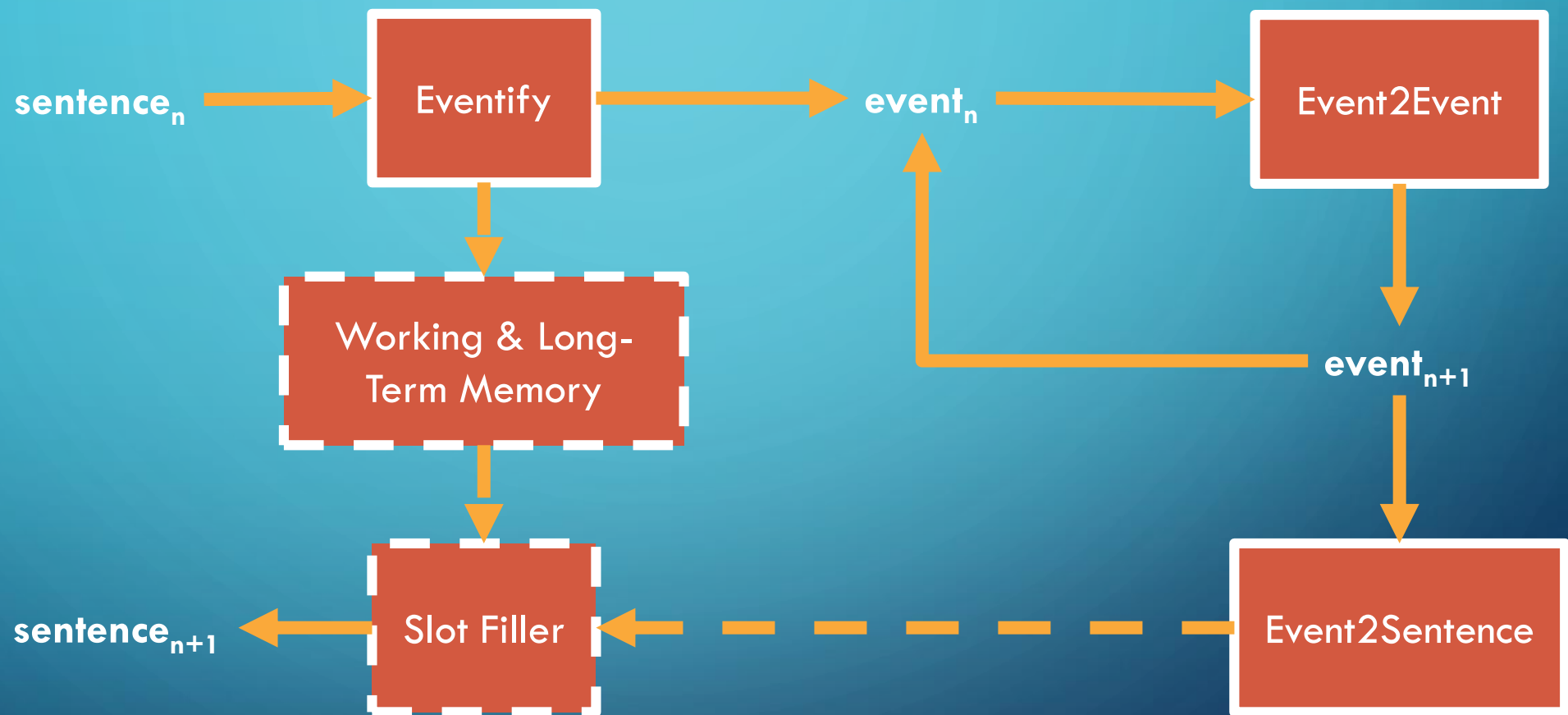
FUTURE WORK

- Experimenting with improving the neural networks
  - Cleaner data
- Evaluating final story
  - ~~Perplexity & BLEU~~
  - Human evaluation

THANK YOU

QUESTIONS?

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