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\textsubscript{n} \rightarrow \text{Eventify} \rightarrow \text{event}\textsubscript{n} \rightarrow \text{Event2Event} \rightarrow \text{event}\textsubscript{n+1} \rightarrow \text{Event2Sentence}

obi wan kenobi and yoda then appear
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
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:** &lt;NE&gt;0 transfer_mesg-37.1.1-1-1 female.n.02 conic_section.n.01
<table>
<thead>
<tr>
<th>Experiment</th>
<th>Perplexity</th>
<th>BLEU</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0) Original Sentences</td>
<td>704.815</td>
<td>0.0432</td>
</tr>
<tr>
<td>(1) Original Words Baseline</td>
<td>748.914</td>
<td><strong>0.1880</strong></td>
</tr>
<tr>
<td>(2) Original Words with &lt;NE&gt;s</td>
<td>166.646</td>
<td>0.1878</td>
</tr>
<tr>
<td>(3) Generalized Baseline</td>
<td><strong>54.231</strong></td>
<td>0.0575</td>
</tr>
<tr>
<td>(4) Generalized, Continued NEs</td>
<td>56.180</td>
<td>0.0544</td>
</tr>
<tr>
<td>(5) Generalized + Genre</td>
<td><strong>48.041</strong></td>
<td>0.0525</td>
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<tr>
<td>(6) Generalized Bigram</td>
<td>50.536</td>
<td>0.1549</td>
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<tr>
<td>(7) Generalized Bigram, Continued NEs</td>
<td>50.189</td>
<td><strong>0.1567</strong></td>
</tr>
<tr>
<td>(8) Generalized Multiple, Sequential</td>
<td>58.562</td>
<td>0.0521</td>
</tr>
<tr>
<td>(9) Generalized Multiple, Any Order</td>
<td>61.532</td>
<td>0.0405</td>
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<tr>
<td>(10) Generalized Multiple, All to All</td>
<td><strong>45.223</strong></td>
<td>0.1091</td>
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<tr>
<td>(11) Generalized Bigram + Genre</td>
<td>48.505</td>
<td><strong>0.1102</strong></td>
</tr>
</tbody>
</table>
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.
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<tr>
<th>Experiment</th>
<th>Perplexity</th>
<th>BLEU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original Sentence → Original Sent.</td>
<td>704.815</td>
<td>0.0432</td>
</tr>
<tr>
<td>Original Words Event → Original Sent.</td>
<td>909.182</td>
<td>0.0015</td>
</tr>
<tr>
<td>Generalized Event → Generalized Sent.</td>
<td><strong>54.264</strong></td>
<td><strong>0.0496</strong></td>
</tr>
<tr>
<td>All Generalized Events → Gen. Sent.</td>
<td>55.312</td>
<td>0.0402</td>
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</tbody>
</table>
sentence\textsubscript{n} \rightarrow \text{Eventify} \rightarrow \text{event}\textsubscript{n} \rightarrow \text{Event2Event} \rightarrow \text{event}\textsubscript{n+1} \rightarrow \text{Event2Sentence} \\
\text{Working \& Long-Term Memory} \\
\text{Slot Filler} \\
\text{sentence}\textsubscript{n+1}
FUTURE WORK

• Experimenting with improving the neural networks
  • Cleaner data

• Evaluating final story
  • Perplexity & BLEU
  • Human evaluation
THANK YOU

QUESTIONS?

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