

AESOP: Abstract Encoding of Stories Objects and Pictures

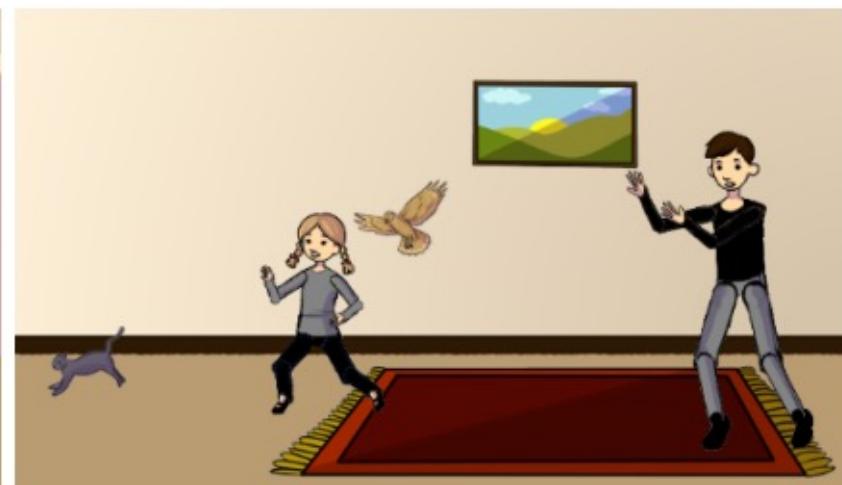
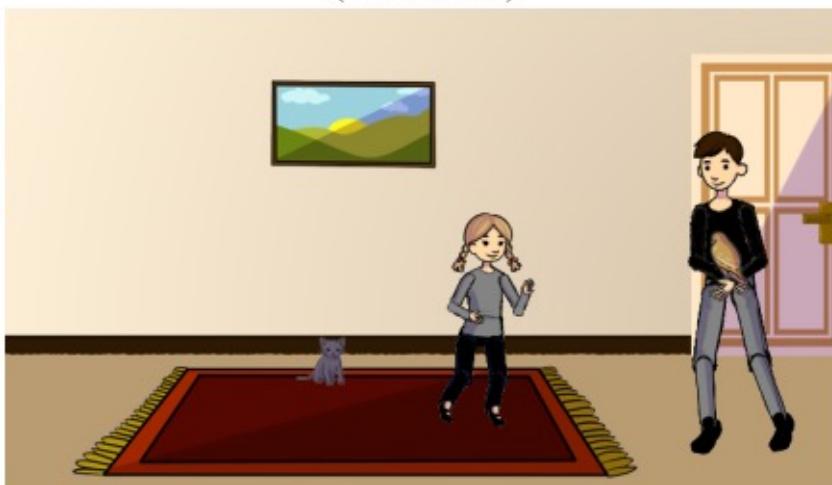
Hareesh Ravi¹²
Mubbashir Kapadia¹

Kushal Kafle²
Scott Cohen²
Jonathan Brandt²



Contributions

Dataset



On a cold winter's day, Harry found a half frozen hawk.

Having pity, he took it home to warm it up.

But when it warmed up, it attacked his family. Gratitude is not to be expected from the wicked.

Contributions

Task



On a cold winter's day, Harry found a half frozen hawk.

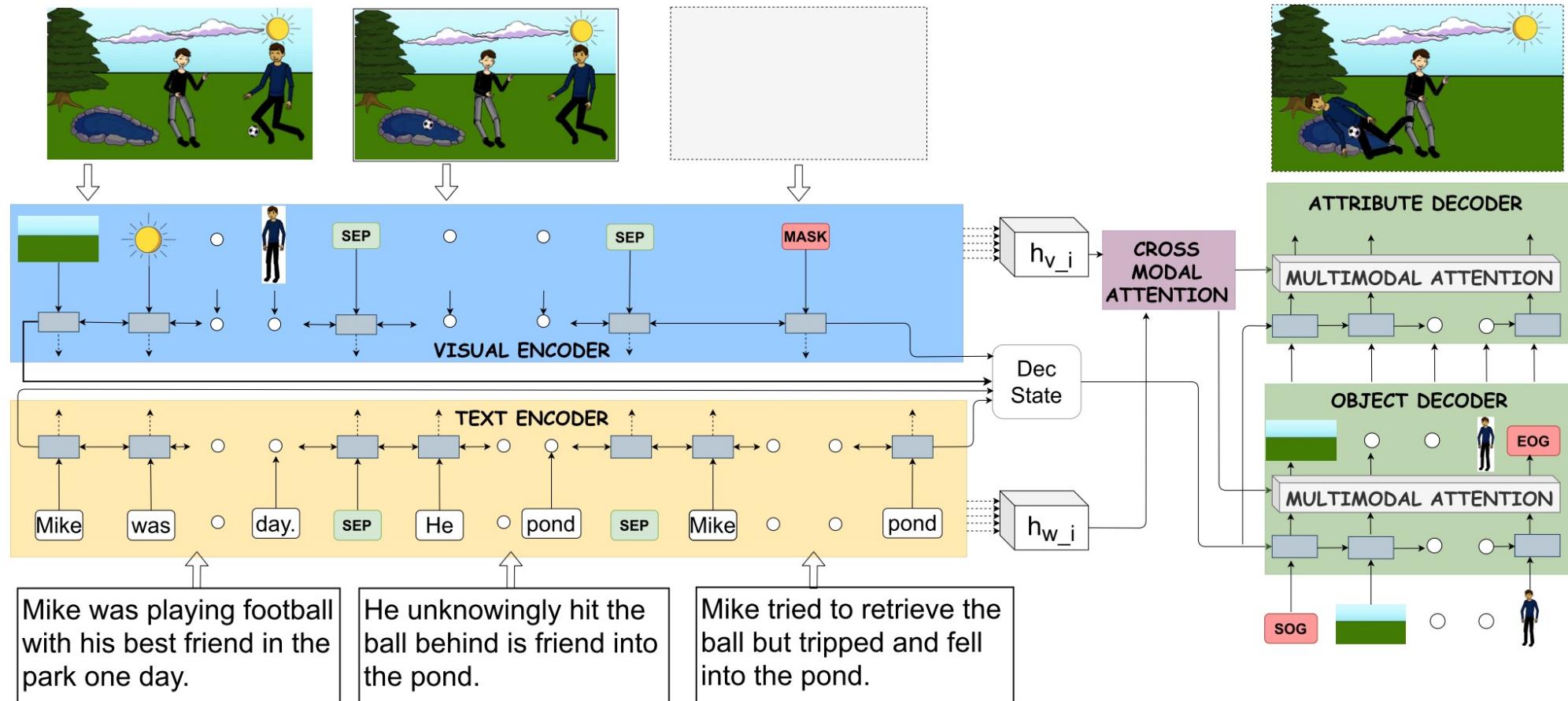


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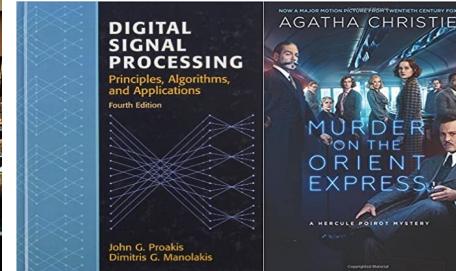
Contributions

Model



Motivation

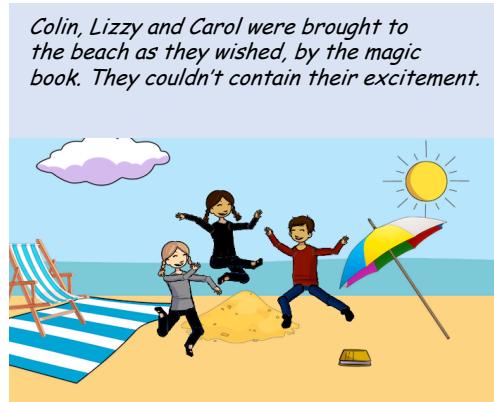
Stories are universal



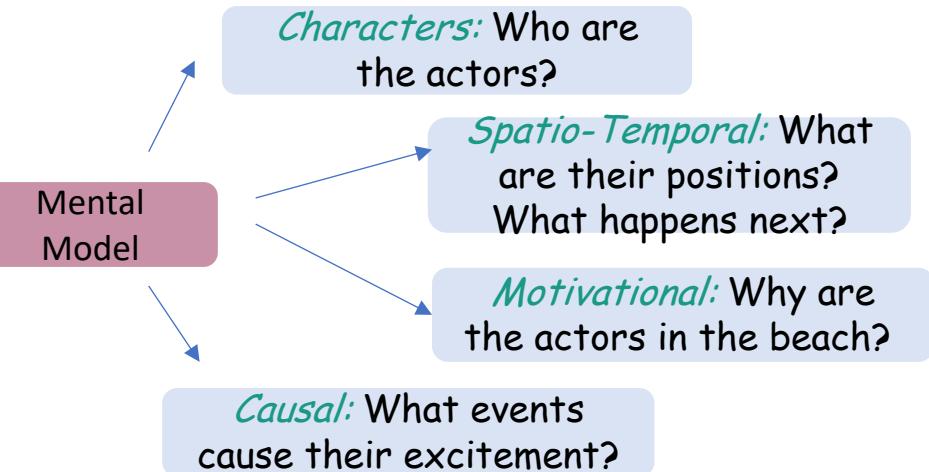
Encodes shared knowledge



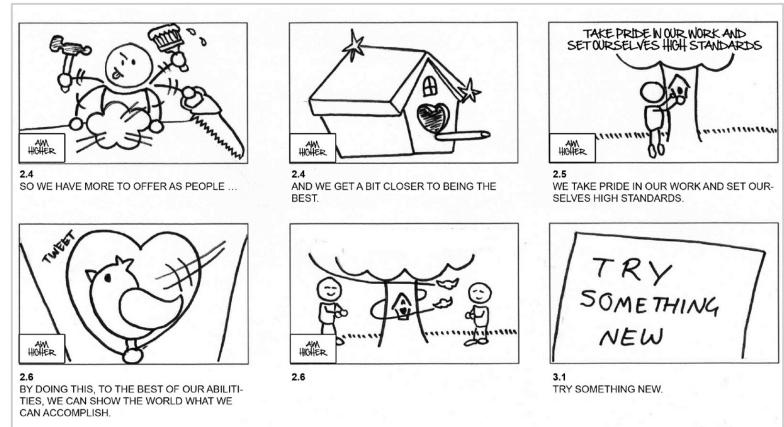
Rich mental models



Colin, Lizzy and Carol were brought to the beach as they wished, by the magic book. They couldn't contain their excitement.



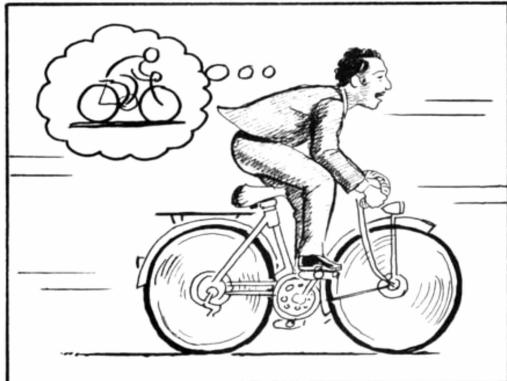
Applications



Automatic Storyboarding

Conversational Assistants

Creative Tasks

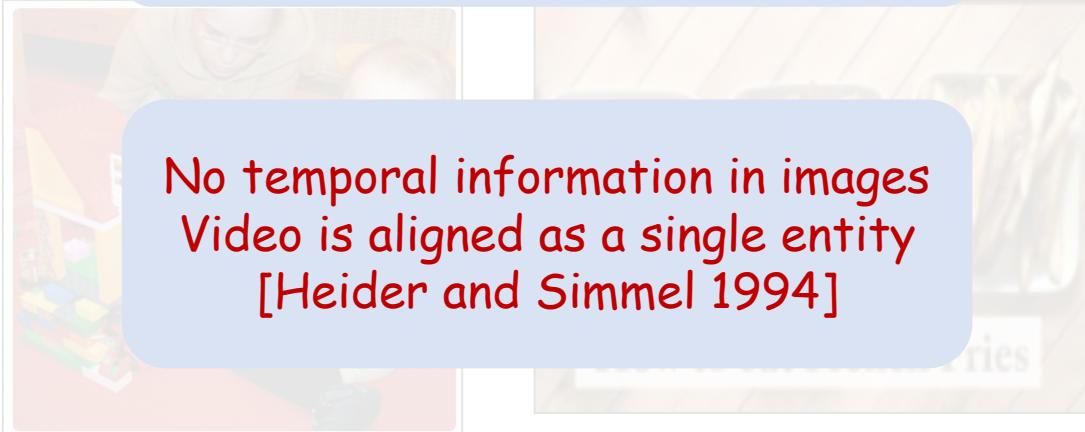


World Models

IMG: <https://www.sightline.co.uk/storyboard-the-key-to-telling-your-story-on-video/>
https://medium.com/@james_gram/creative-intelligence-ai-assistants-and-data-ethics-1c9272d46f6f
<https://www.adobe.com/sea/products/premiere/movie-and-film-editing.html>

Prior Work

Factual information extraction
[Graesser et. al. 1994]



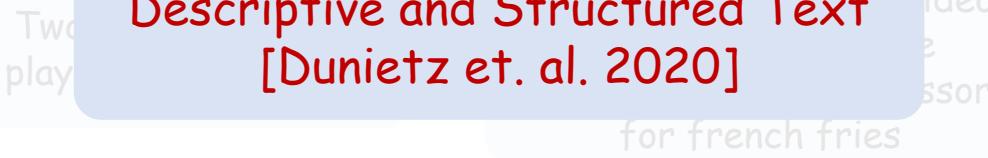
No temporal information in images
Video is aligned as a single entity
[Heider and Simmel 1994]

Incoherent Stories
[Ravi et. al. 2018]



Models the perceptive process

Descriptive and Structured Text
[Dunietz et. al. 2020]



No Scene/Story creation

Requires all of world knowledge

Visual Storytelling (VIST) [Hao et. al. NAACL 2016]

Constructing inferences during narrative text comprehension [Graesser et. al. 1994]

An experimental study of apparent behavior [Heider and Simmel 1994]

Show me a Story: Towards Coherent Neural Story Illustration [Ravi et. al. 2018]

To test machine comprehension, start by defining comprehension [Dunietz et. al. 2020]

AESOP Dataset

Creativity over Perception

Bounded Visual World

Causal and Coherent
Narratives

AESOP Dataset

Creativity over Perception

StoryBook Preview

Roommate Fiasco!

[Click Here to edit this panel](#)



Alice was watching her favorite sitcom in TV. She was laughing out loud enjoying the jokes not realizing she was making too much noise.

[Click Here to edit this panel](#)

Image not available



No Story written for this panel yet

[Click Here to edit this panel](#)

Image not available



No Story written for this panel yet

AESOP Dataset

Creativity over Perception

Story Panel Editor

Currently Editing Panel 2. Scene initialized from previous scene. Please make changes to the scene or start from scratch by Reseting and/or Changing Scene Type.

The Story Panel Editor interface displays a scene where a woman sits on a couch and a man stands near a fireplace. A television is on a stand to the right. Below the scene are controls for camera movement: 'Bring Closer' and 'Move Further' sliders, and 'Flip' buttons. A 'Type' dropdown menu shows icons for a computer monitor, a lamp, a television, and a book. At the bottom are navigation buttons: 'Previous Panel', 'Preview Story', 'Reset', 'Copy previous scene', 'Change Scene Type: Living', and 'Next Panel'.

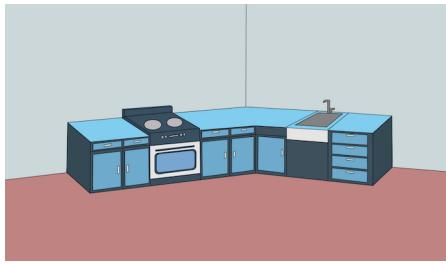
People	Animals	Large objects	Small objects
Jane Steve Elaine Carol	Lizzy Jeff Jack John	Martha Jenny Mike Colin	Emma Ryan Emily Harry
Bobby Alice Eddy Jared			

Story Text for this panel: 208 characters remaining

Ryan barged into the living room angrily.

AESOP Dataset

Bounded Visual World



Kitchen



Beach

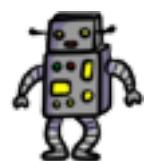
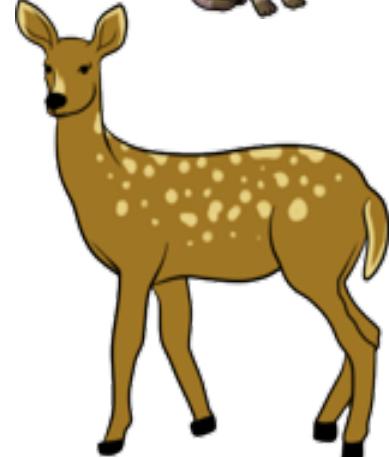
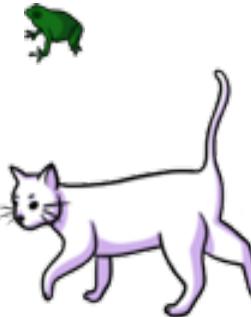
Eddy



Emma



Martha



AESOP Dataset

Causal and Coherent Narratives

A New Me
GENRE: Fantasy



Mike was watching TV when suddenly an unusual promotion appeared. The advertisement was about buying your own clone.

Mike was curious about the commercial, so he did what every bored man would do in his position; a bad decision.

And so he did, he called for a clone and there it was, another version of him. It was true; he thought it was a joke. Next time he would think twice about buying something on TV.

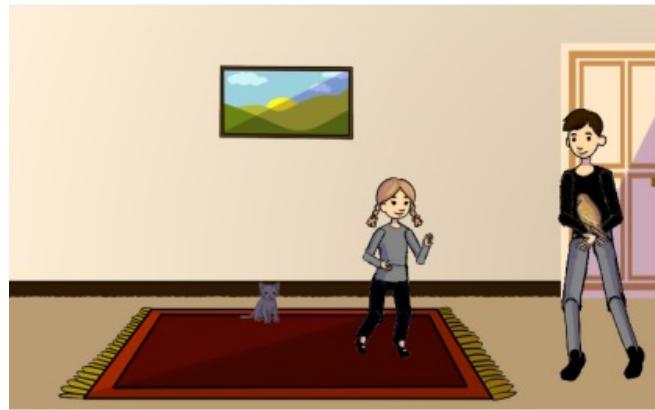
Dataset Comparison



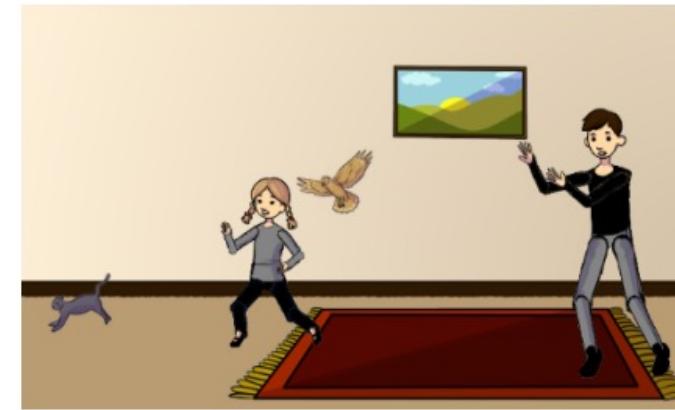
97%



On a cold winter's day, Harry found a half-frozen hawk



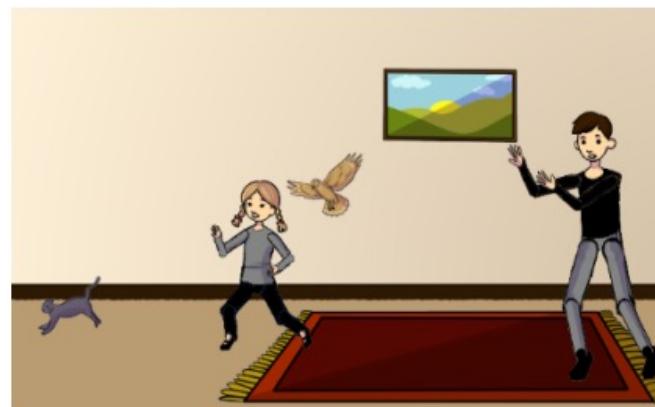
Having pity, he took it home to warm it up.



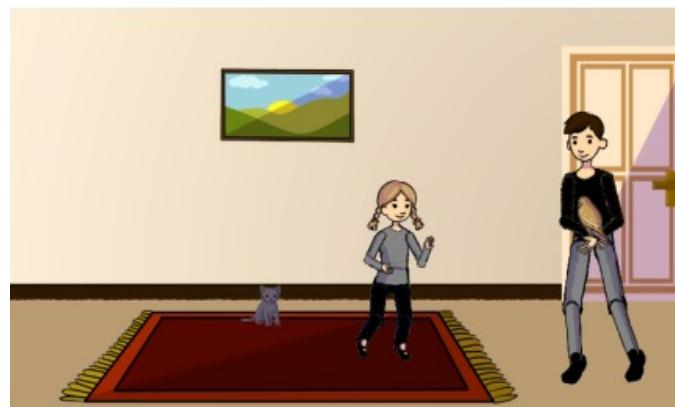
But when it warmed up, it attacked his family. Gratitude is not to be expected from the wicked.



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RUTGERS

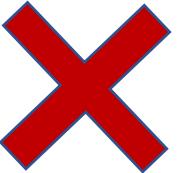
UNIVERSITY | NEW BRUNSWICK

Adobe

Dataset Comparison



65%



The church that the marriage was to be held at was a historic one



The bride and the groom posed happily on their wedding day



The best man and one of the groomsman look happy to be a part of something important



The best man and the bridesmaid decided to smile for the camera



After the wedding everyone hit the dance floor to party the night away



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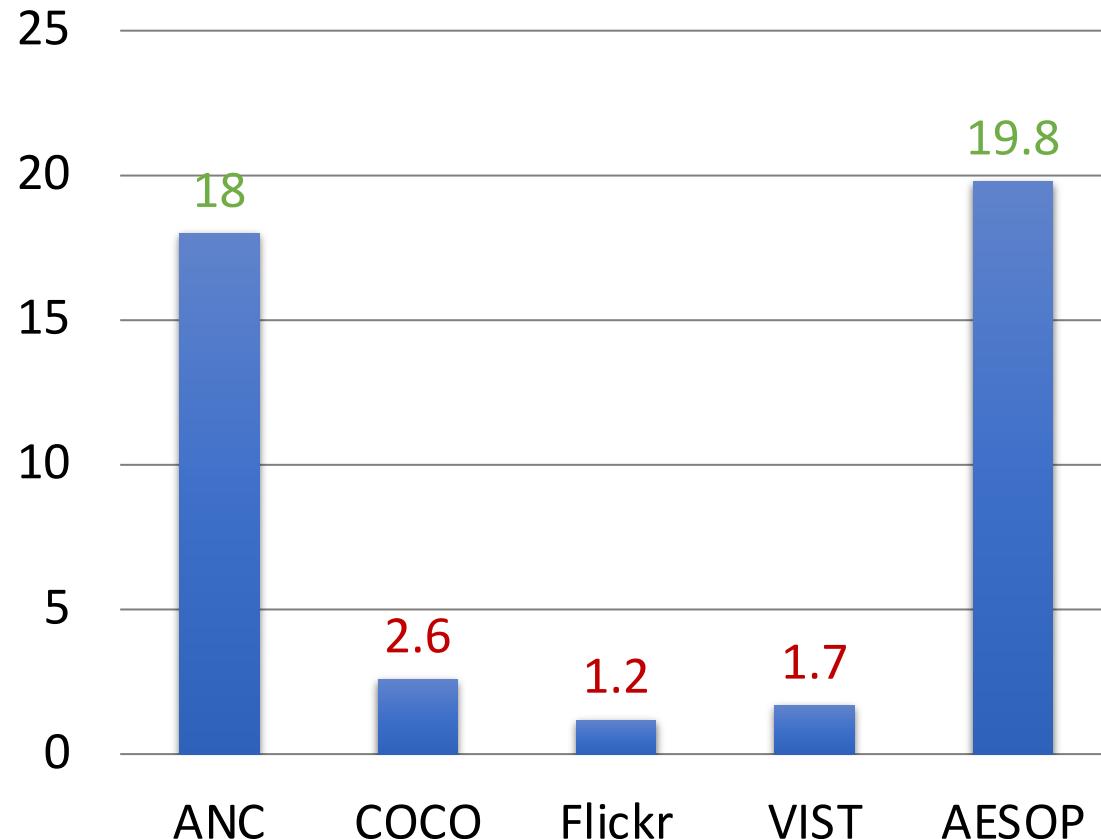
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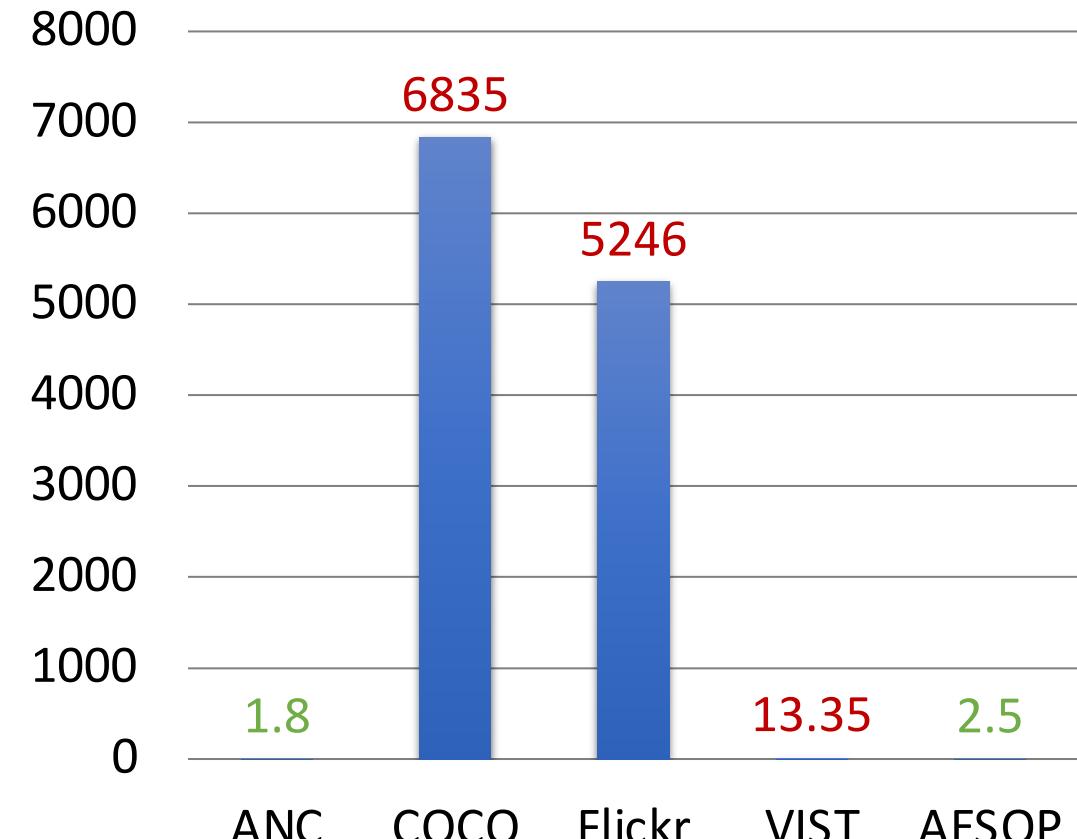
After the wedding everyone hit the dance floor to party the night away

Dataset Comparison

% of Verbs over all words



Ratio of “Sit” to “Worry”

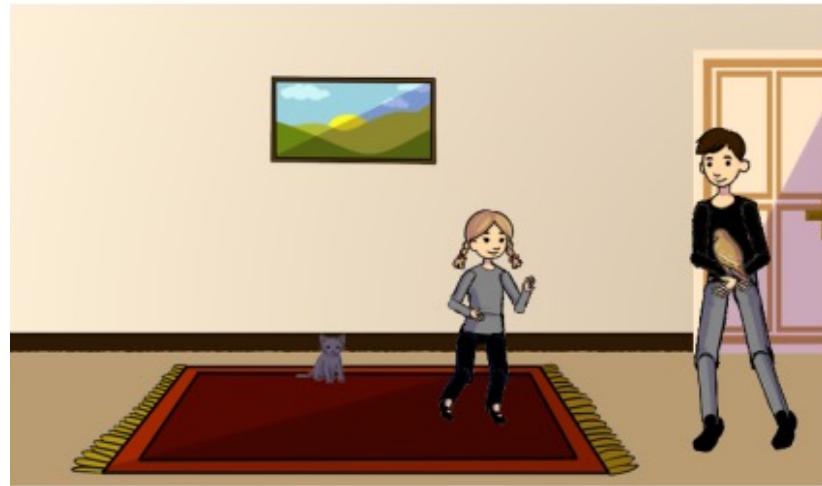


Tasks

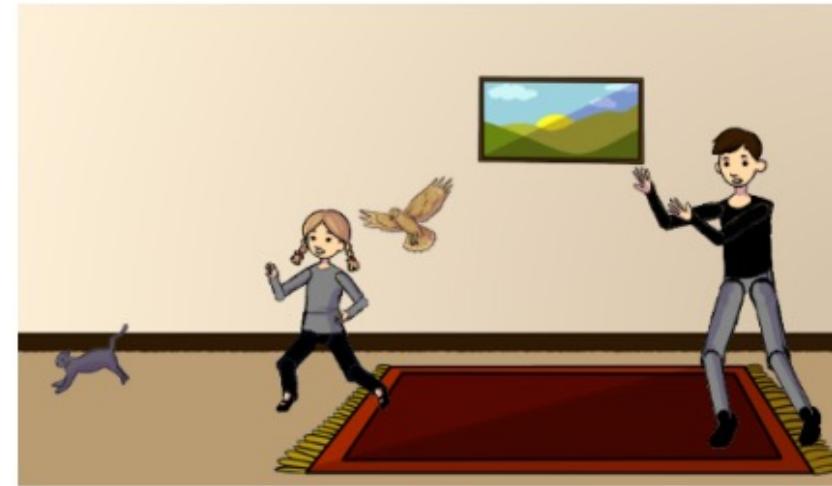
Assistant Illustrator



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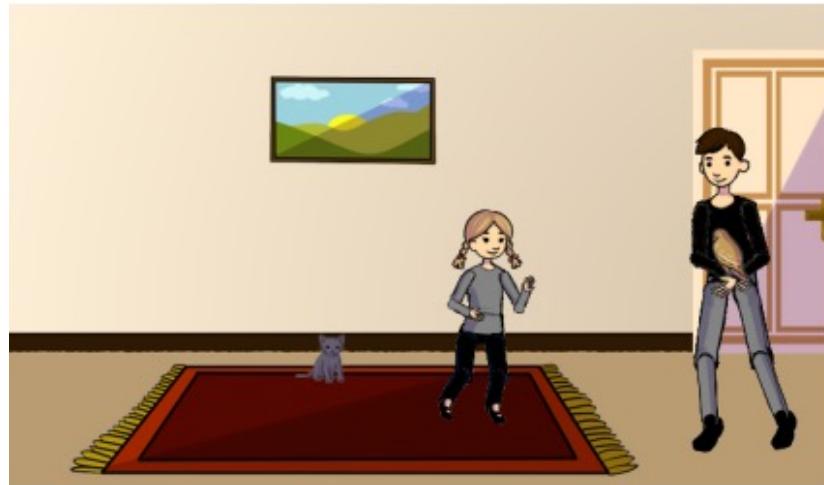
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Tasks

Assistant Writer



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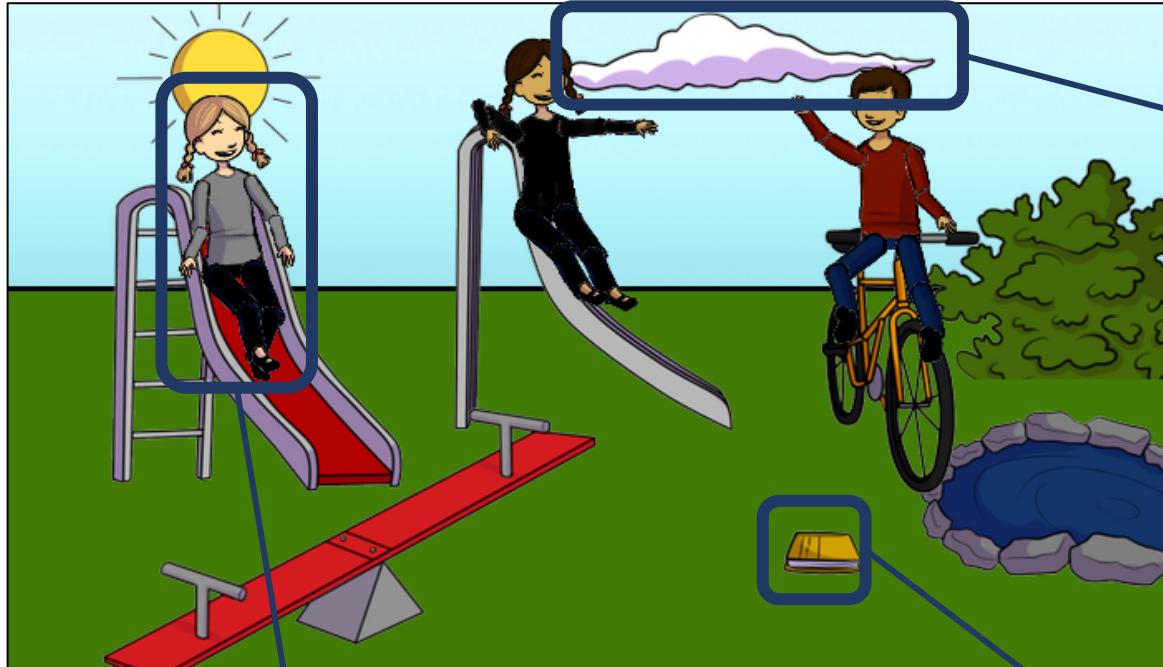
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Model

Abstract Visual Representation



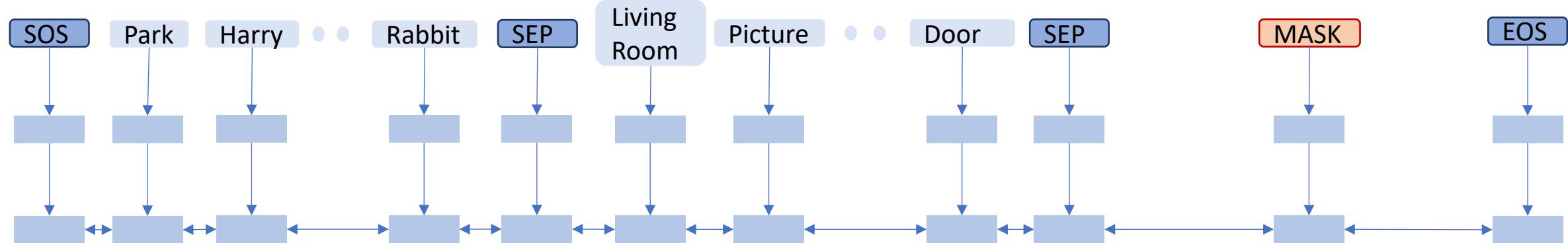
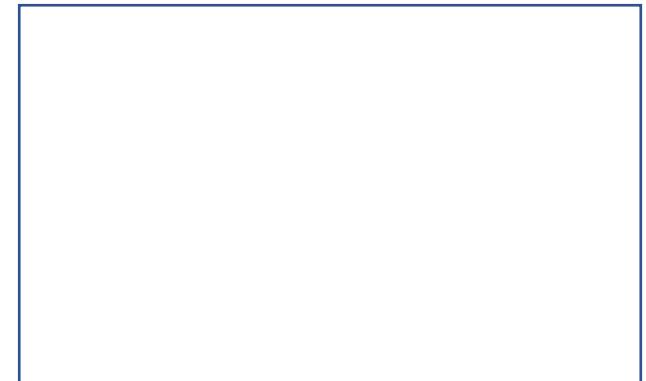
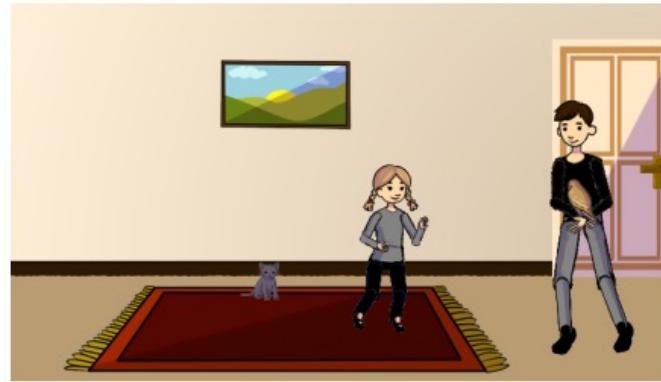
Obj : Cloud
Loc : x,y,z
Pose : -
Expr : -

Obj : Carol
Loc : x,y,z
Pose : 2
Expr : Happy

Obj : Book
Loc : x,y,z
Pose : -
Expr : -

Model

Visual Story Encoder



Visual Context

Object States

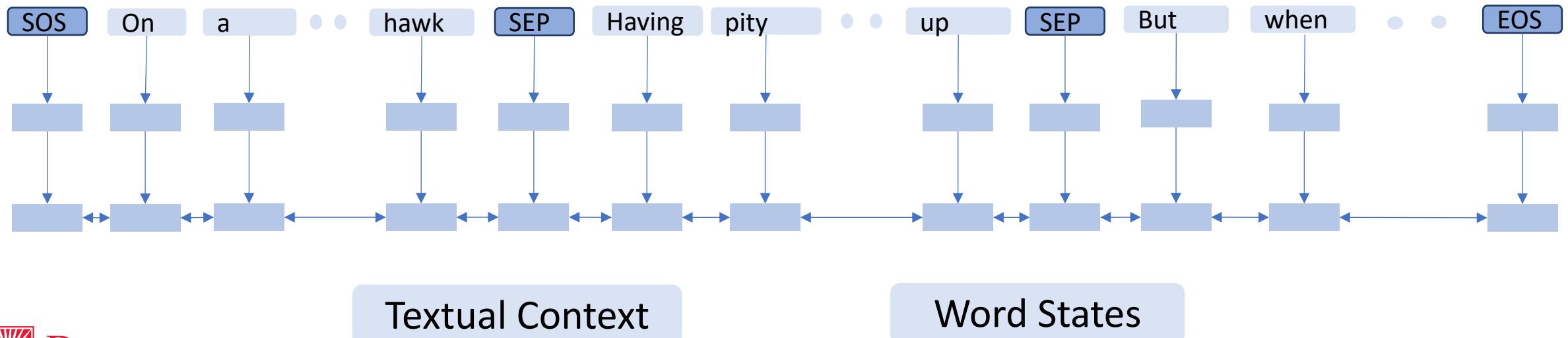
Model

Text Story Encoder

*On a cold winter's day,
Harry found a half-frozen
hawk*

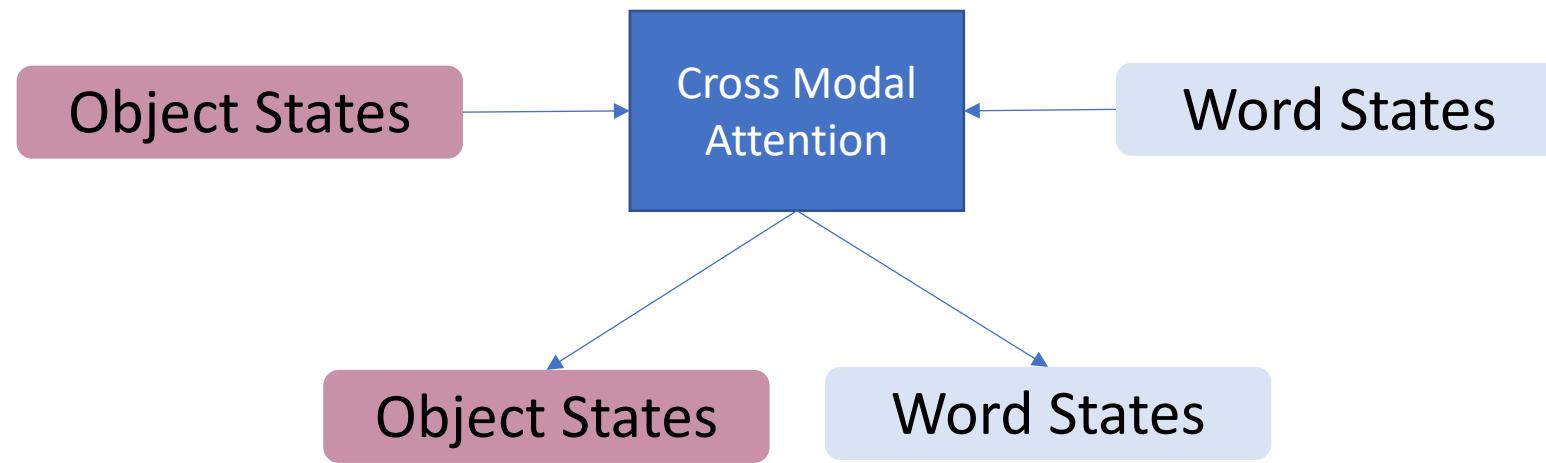
*Having pity, he took it home to
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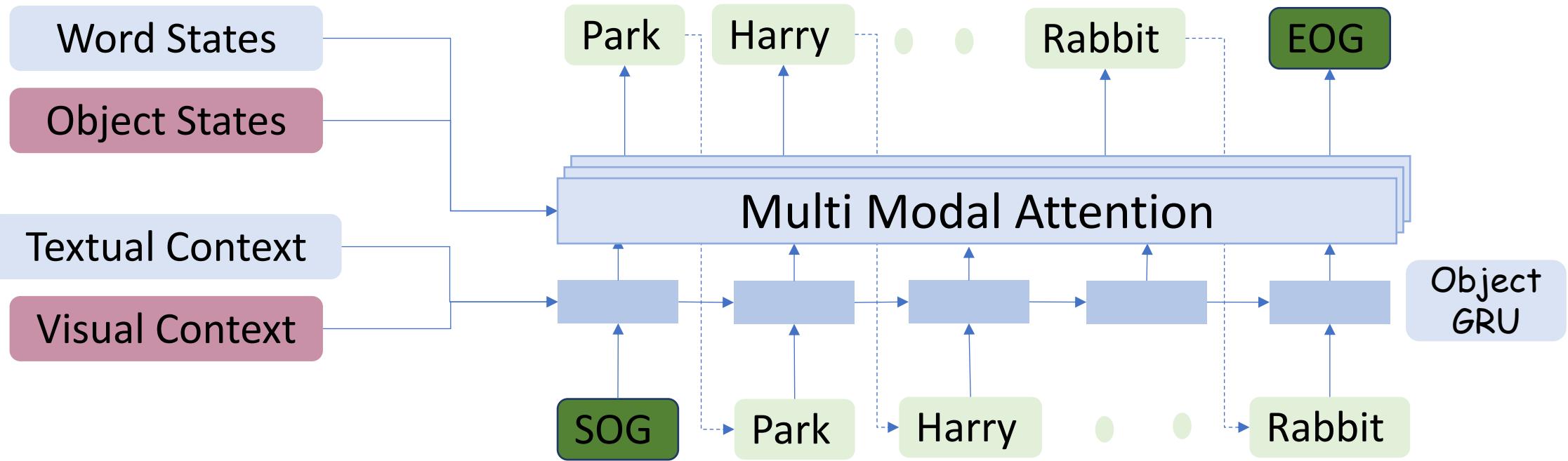
Model

Multimodal Encoder



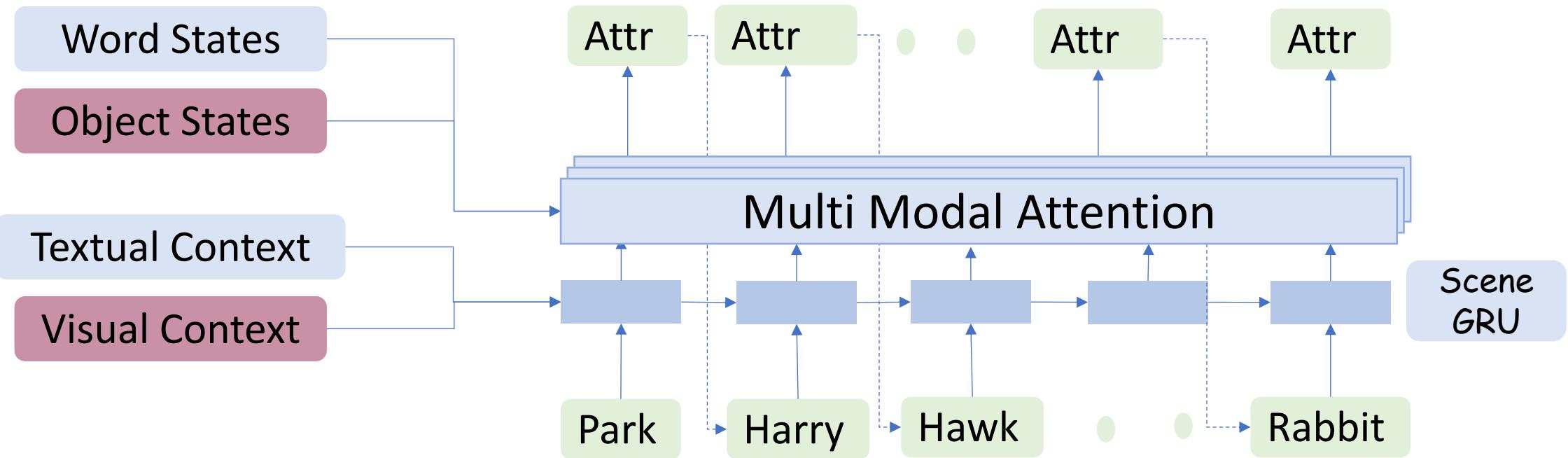
Model

Object Decoder



Model

Attribute Decoder



Results



Harry and Ryan were friends. On a holiday they went into a forest to enjoy its beauty. Suddenly they saw animals running towards them. They became frightened



Harry ran upto a tree and climbed quickly. He didn't think of Ryan. Ryan did not know how to climb a tree. He remembered hearing that animals do not prefer dead bodies. So he fell to the ground and held his breath.

Animals sniffed him and thought he was dead. So they went on their way. Harry asked Ryan "What did they whisper in your ears?". Ryan replied "They asked me to keep away from friends like you"

?

Results

Ground Truth



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Results

Proposed



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Results

Human



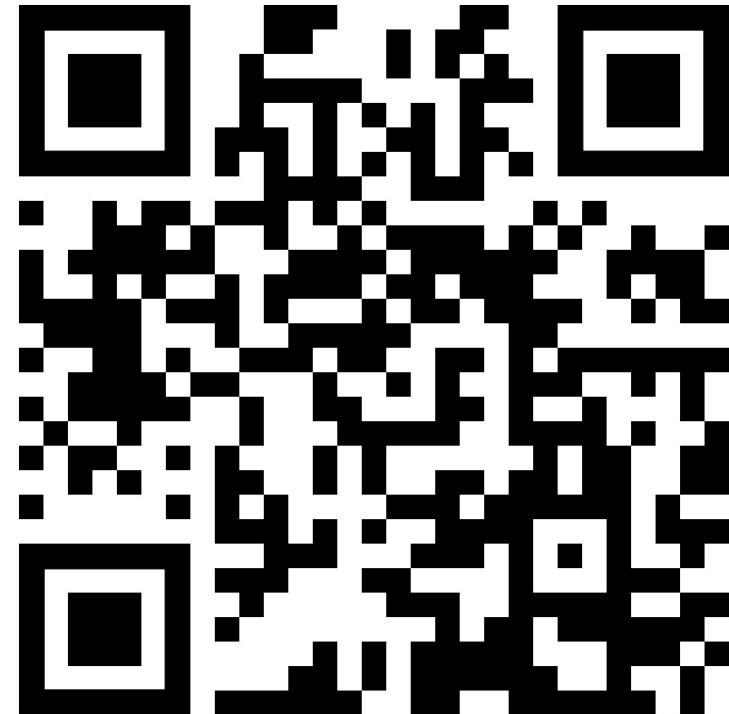
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For More Information

2021 ICCV OCTOBER 11-17
VIRTUAL



Paper Session 2A and 2B:

Tuesday, October 12, 11:00 AM – 12:00 PM, EDT
Thursday, October 14, 6:00 PM – 7:00 PM, EDT