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Proceedings of the Annual Meeting of the Cognitive Science Society

Title

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Permalink

<https://escholarship.org/uc/item/9xm0p914>

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 43(43)

ISSN

1069-7977

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Publication Date

2021

Peer reviewed

Understanding Image Sequences Via Narrative Sensemaking

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Abstract

When humans make sense of the world, they do not understand it as a cascade of observations; rather, from a cascade of observations, humans assemble a holistic narrative, connecting their observations using prior knowledge and inference. The final product of observations connected with prior knowledge and inference may be modeled as a knowledge graph. The process of sensemaking described above is one we seek to emulate in the realm of image understanding through a computational system. Starting from observed objects and relationships in a sequence of images (from Visual Genome Scene Graphs), the system we are building consults a commonsense knowledge network (ConceptNet), over-generates a set of hypothesized narrative-based connections between observations, and evaluates and trims its hypotheses through Multi-Objective Optimization to create a consistent set. The resultant knowledge graph reflects the system's consistent speculations, beyond the directly observable, of what is happening in, and across, the images.