

# Drawing Insights: Multi-Level Representation Learning for Visual Language

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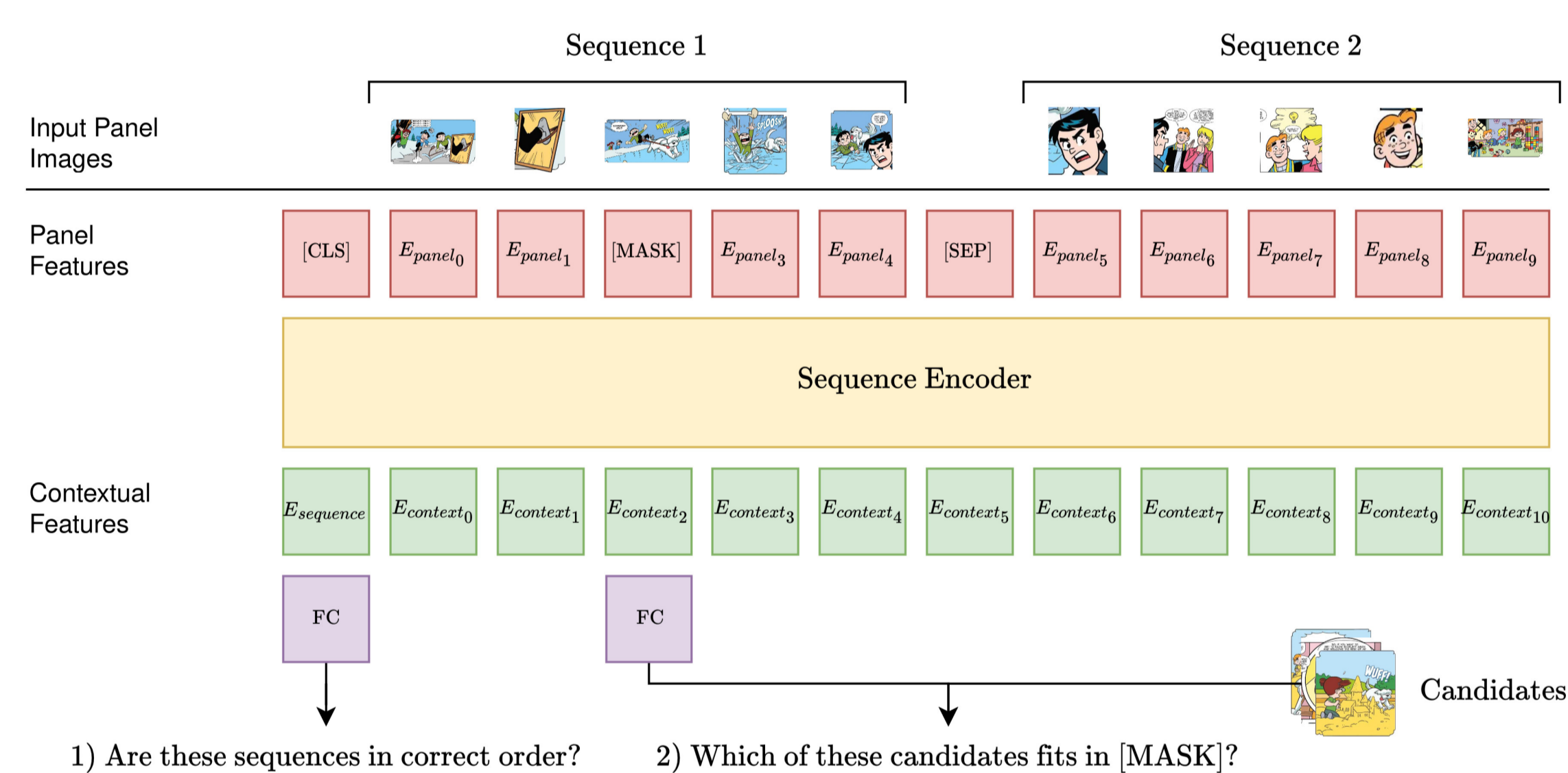


## Context

1. Computational analysis of comics requires extensive annotations.
2. Machine learning-aided methods could help overcome this challenge.
3. Unsupervised representation does not require annotations.

## ASTERX

A Self-supervised Transformer Encoder for comic panel Representation eXtraction leverages the sequential nature of comic panels to learn contextual representations.

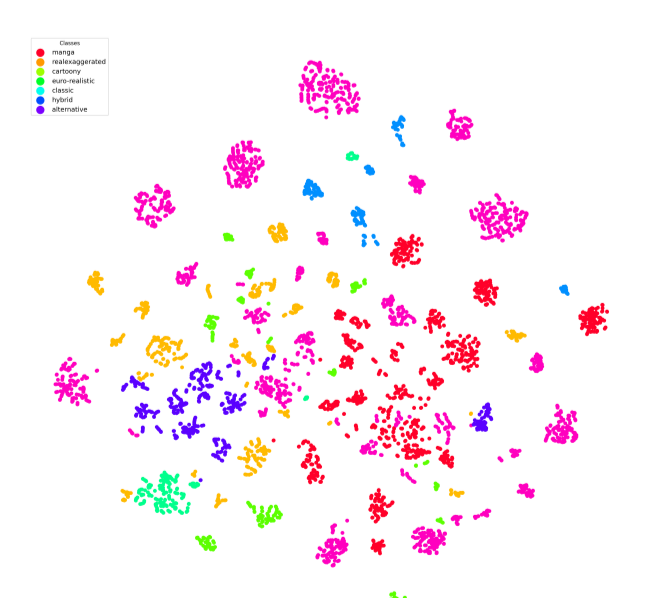


We form a qualitative understanding of the performance of **ASTERX** in comparison to existing representation learning methods through a panel retrieval task.

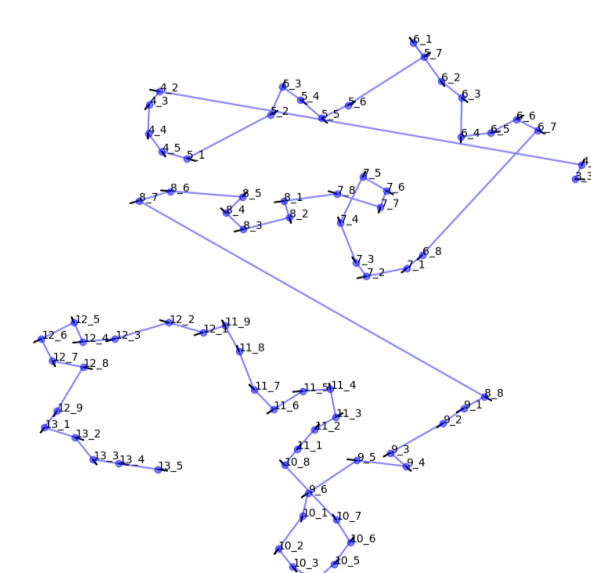


The training process of **ASTERX** intricately shapes the representation space. This enables comparative analyses in two ways:

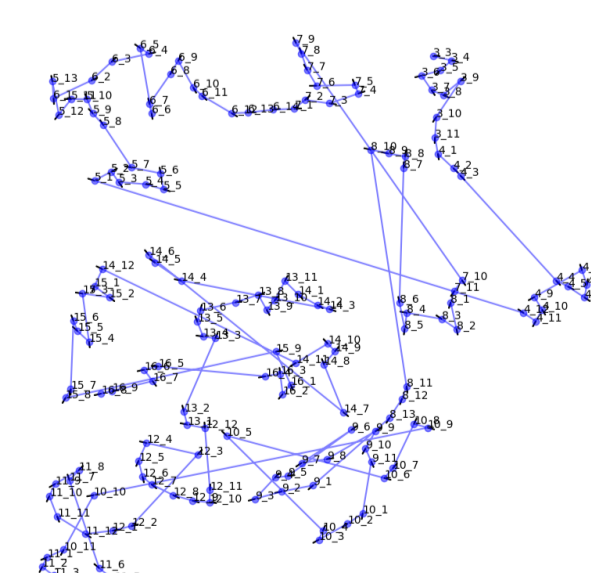
- How does comic A compare to comic B?
- How does comic panel A compare to comic panel B within the same comic?



How does **ASTERX** compare panels between different comics?



How does **ASTERX** compare panels within the same comic?



How does **ASTERX** compare panels within a longer comic?

## ELRIC

Context normalisation for Representation learning In Comics leverages contextual features learned by **ASTERX** to learn context-free representations. This makes **ELRIC** ideal for comic character matching.



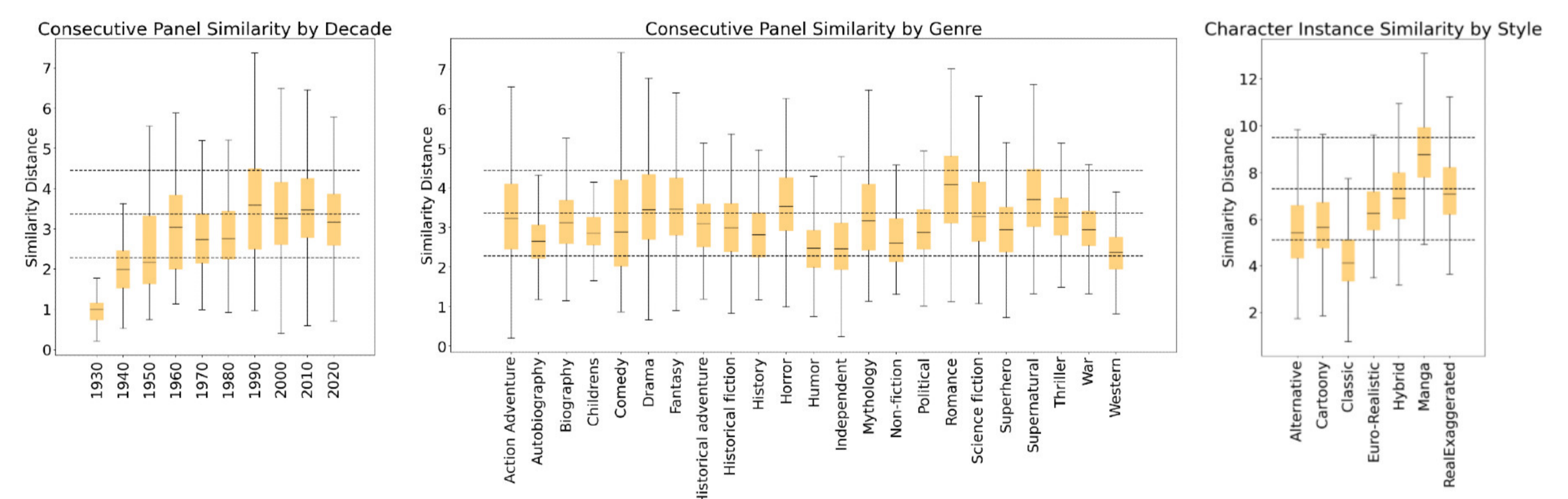
**ELRIC** also captures aspects such as emotion in terms of valence and arousal.



How does **ELRIC** view character emotion in terms of valence and arousal?

## Applications in Cultural Analysis

**ASTERX** helps us understand how conceptual gaps between consecutive comic panels vary over 10 decades and various genres. **ELRIC** helps us dissect character instances similarity across styles of comics.



Character variation in *Akira* (Japanese Manga, 1987).



Character variation in *Nell'Impero degli Incas* (Italian Classic, 1936).

## Sounds Interesting!

This research is part of my thesis for the Master Artificial Intelligence at the University of Amsterdam. If this poster seems interesting, scan the QR code to take a look at my thesis in which I discuss much more!

