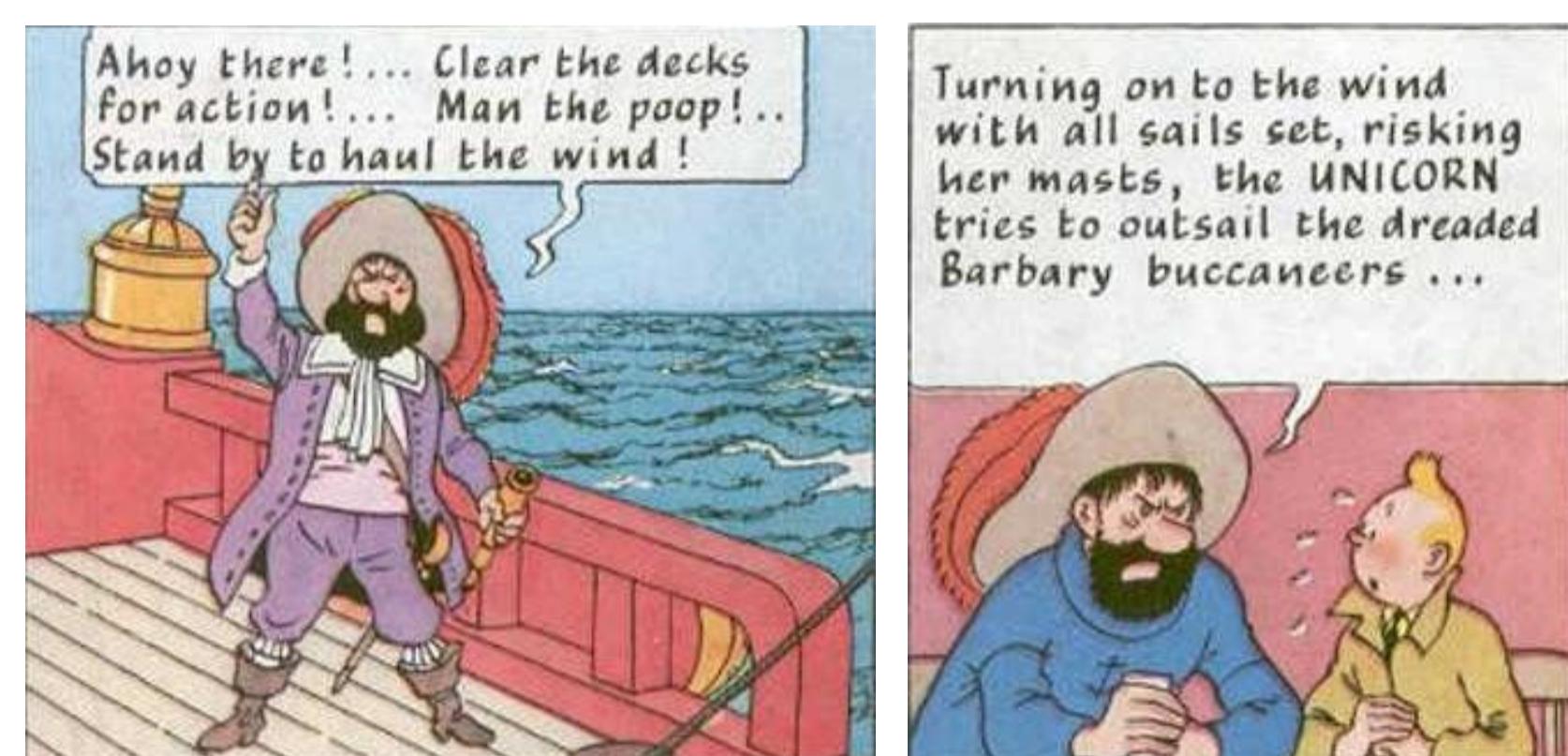


Drawing Insights: Multi-Level Representation Learning for Visual Language

Sam Titarsolej, Neil Cohn, Nanne van Noord



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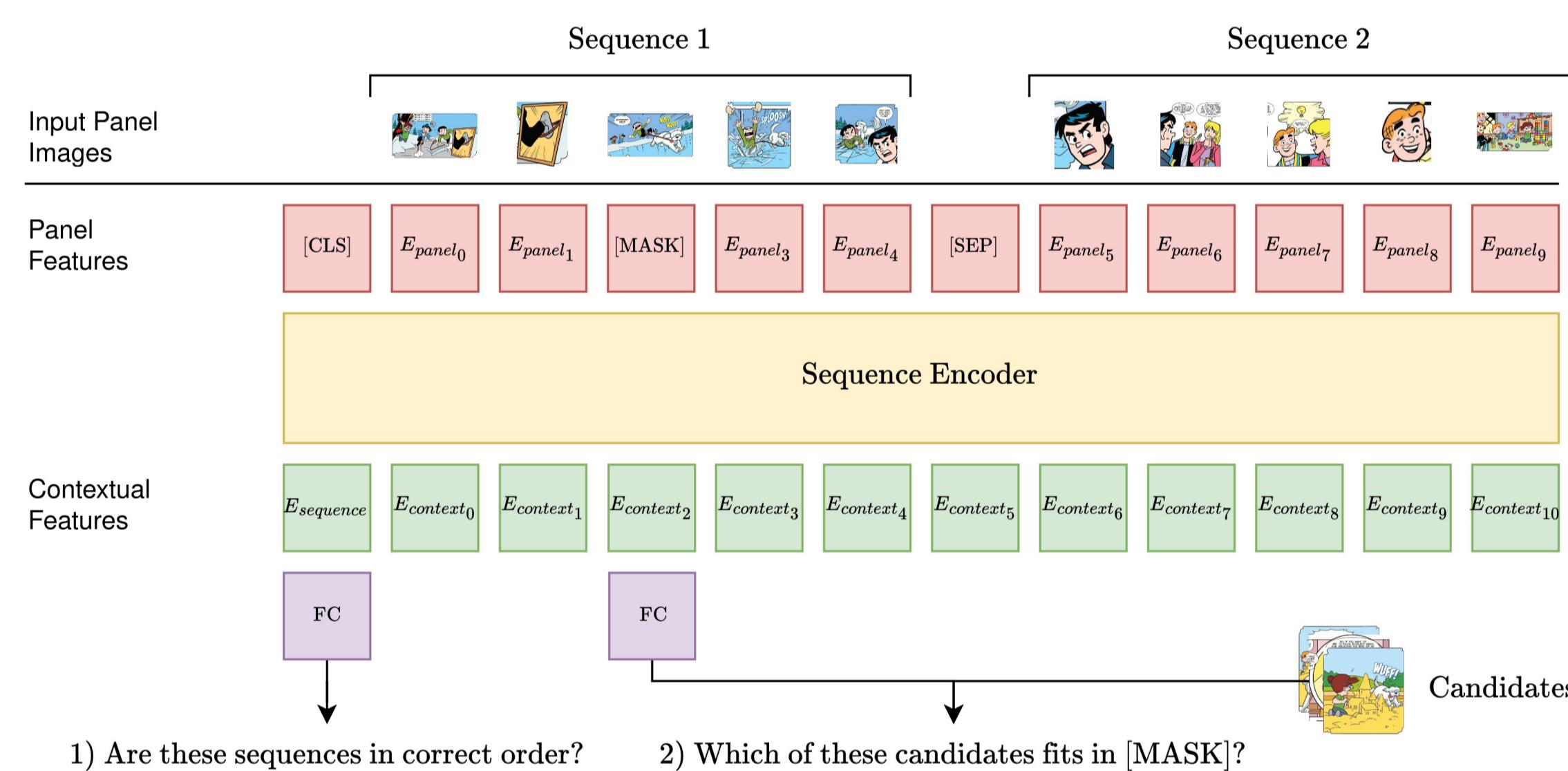


Context

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 **E**xtraction leverages the sequential nature of comic panels to learn contextual representations.

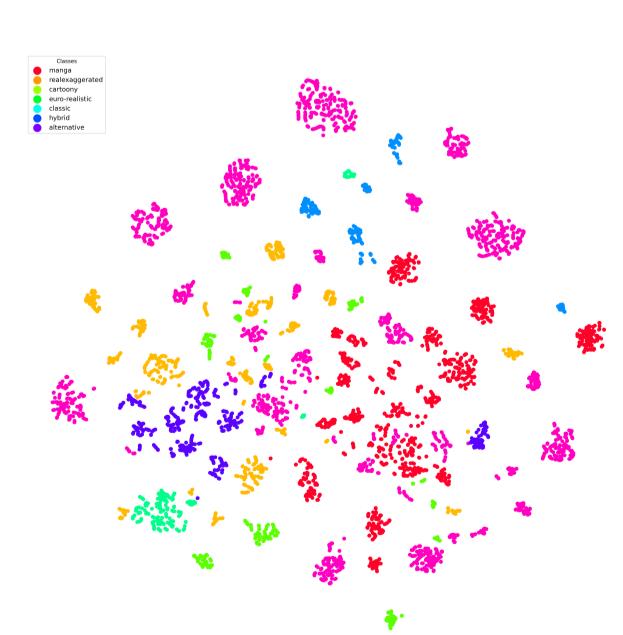


We form a qualitative understanding of the performance of **ASTERX** in comparison to existing representation learning methods through a panel retrieval task.

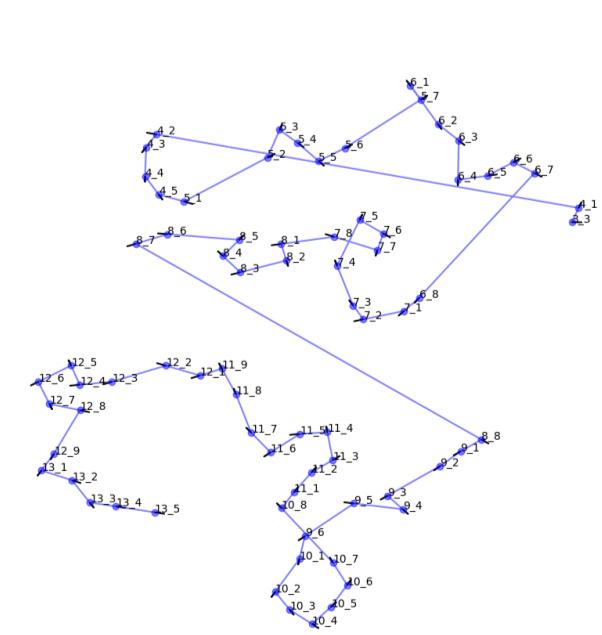


The training process of **ASTERX** intricately shapes the representation space. This enables comparative analyses in three ways:

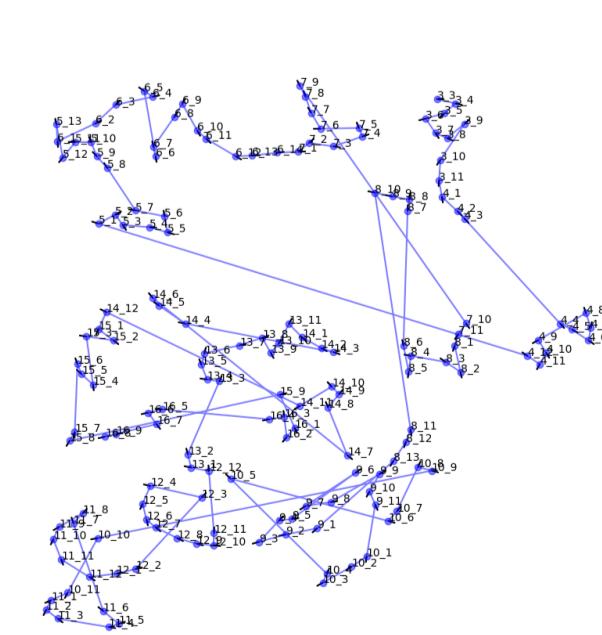
- How does comic A compare to comic B?
- How does comic panel A compare to comic panel B within the same comic?



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



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



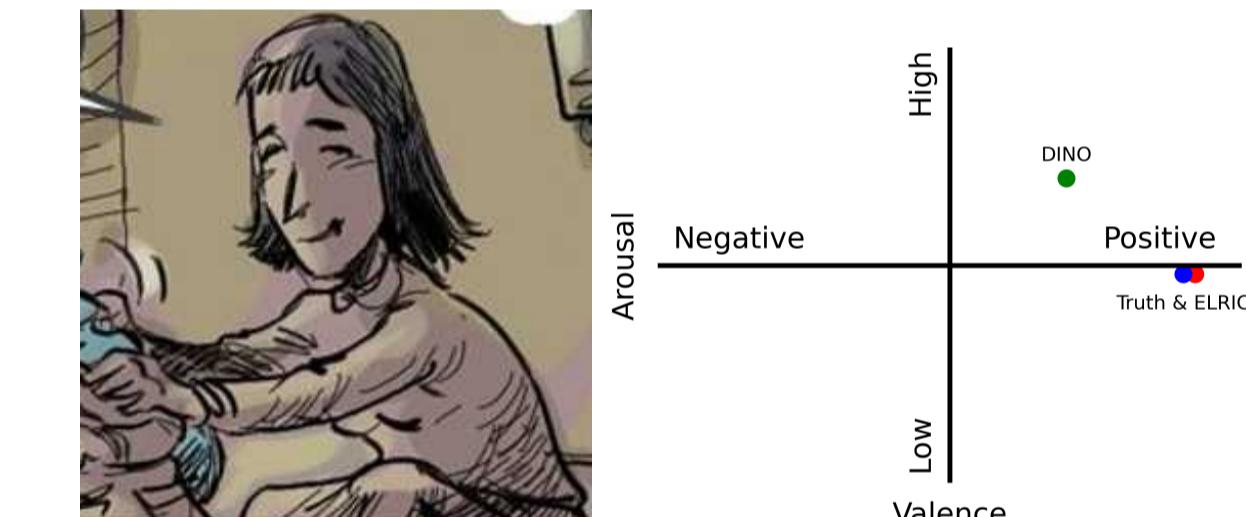
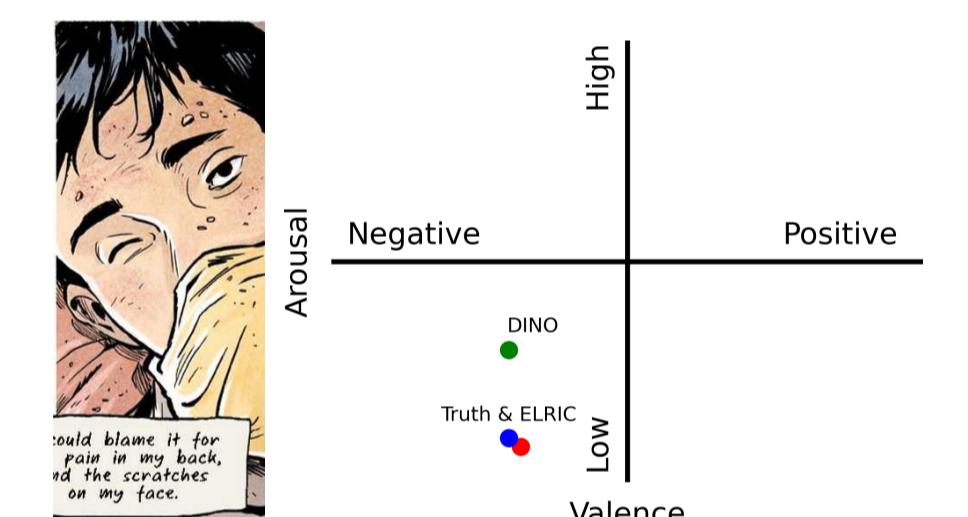
How does **ASTERX** compare panels within a longer comic?

ELRIC 🦸

ContEx 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.



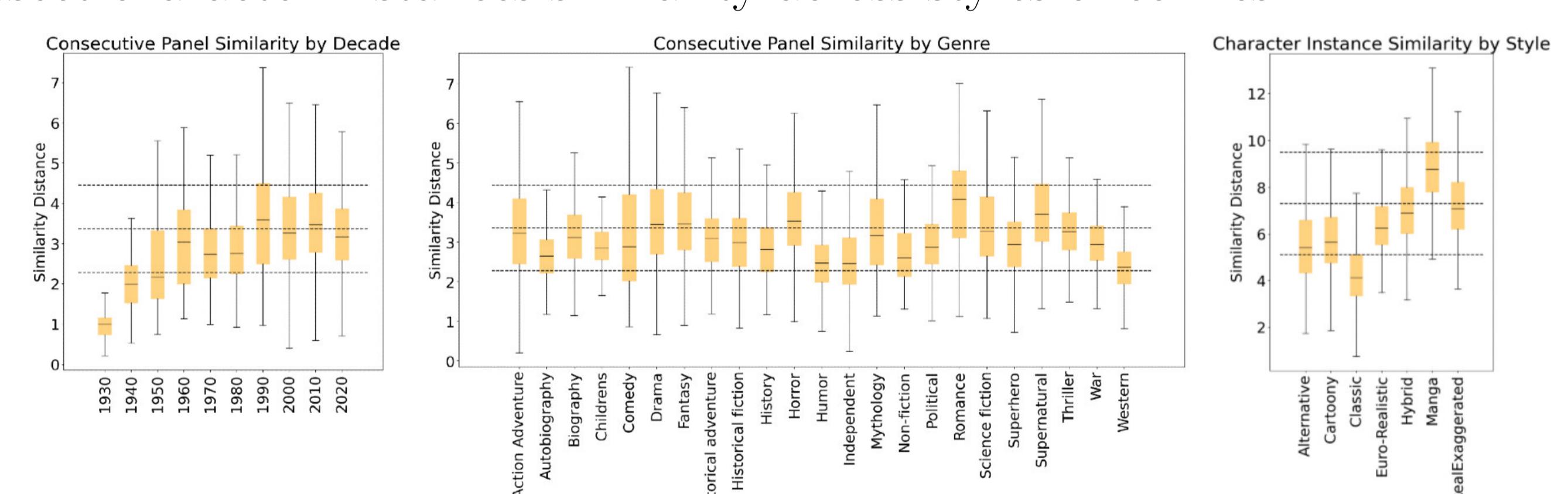
ELRIC also captures aspects such as emotion in terms of valence and arousal



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!

