# Understanding Stories by Detecting Tropes
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## Tropes and where to find them
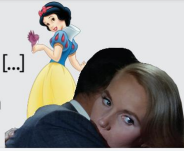
**Definition**: A trope is a cultural narrative convention, a storytelling device.

tvtropes

An organic wiki-style website inventoring 27,000+ tropes found in movies, books, TV shows...

Abstraction scale

• Plot
e.g. *Save the Princess*

• Characters / Events [...]

• Frame Composition
e.g. *Revealing Hug*

## Why does it matter?

In addition of being pop culture facts about movies or TV shows, tropes form the essence of our culture and understanding of the world.

## 2021: Release of TiMoS dataset [1].

• Introduces **Trope Detection in Movie Synopses** challenge
• TiMoS contains 5000+ movie synopses & Trope appearances in each movie for 95 hand-picked tropes
• MulCom: SOT network predicting trope appearance
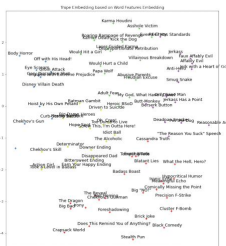
Tropes based on word embeddings

## Leveraging tvtropes knowledge

• Scraping examples from tvtropes
• Analyzing and evaluating the dataset
• Preprocessing (removing *bad* examples)

*Would Hurt a Child* Trope

Nb of examples by trope:
| | |
|---|---|
| Median | 6,032 |
| Min | 1,003 |
| Max | 25,165 |

Example: "One of the thieves takes a young girl hostage and threatens to drop her over the railing."

## Introducing a new task:
## Identifying tropes from examples

**3 Models**:
• SVC with tf-idf features
• BiLSTM with GloVe Embedding
• BERT with classification head (fine-tuned)

**2 Training approaches**:
• Individual binary classifiers (I)
• Muticlass classifier (M)

Classes are balanced by ramdom sampling
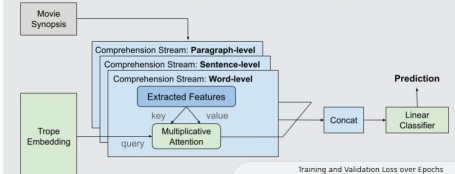
## Application to TiMoS (multi-label)

• Predict sentence by sentence & Keep max predicted proba (S)
• Predict full text (F)

Detect *Would Hurt a Child*
| F1 score: | |
|---|---|
| MulCom | 12.36 |
| SVC (I) (F) | **21.67** |
| BiLSTM (I) (S) | 16.21 |
| BERT (I) (F) | 18.37 |

→ Similar results for the other tropes: **Word-level features** are crucial!
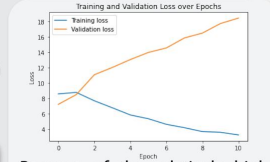
## A multi-level comprehension network (aiming at harnessing examples)



Extracted Features:
• Sentence & Paragraph level: BERT
• Word level: GloVe

## Results on TiMoS
| F1 score: | | |
|---|---|---|
| | MulCom | **25.00** |
| | Ours | 18.57 |

**In progress**:
• Fine-tuning BERT on trope identification
• Training the network on TiMoS + Examples



Because of the relatively high number of parameters compared to the training set's size, our model overfits after 1 epoch.

## Conclusion

• Trope detection remains an open and challenging task (even for humans [1]).
• Leveraging crowdsourced examples and using multi-level features might be key in this task.

## Reference
[1] C. Chang, H. Su, J. Hsu, Y. Wang, Y. Chang, Z. Liu, Y. Chang, W. Cheng, K. Wang, and W. Hsu. Situation and Behavior Understanding by Trope Detection on Films, 2021.

Stanford University, CS224N