CAIR CENTRE FOR ARTIFICIAL INTELLIGENCE RESEARCH

Novelty Detection : Experiment on IMDB dataset

BIMAL BHATTARAI

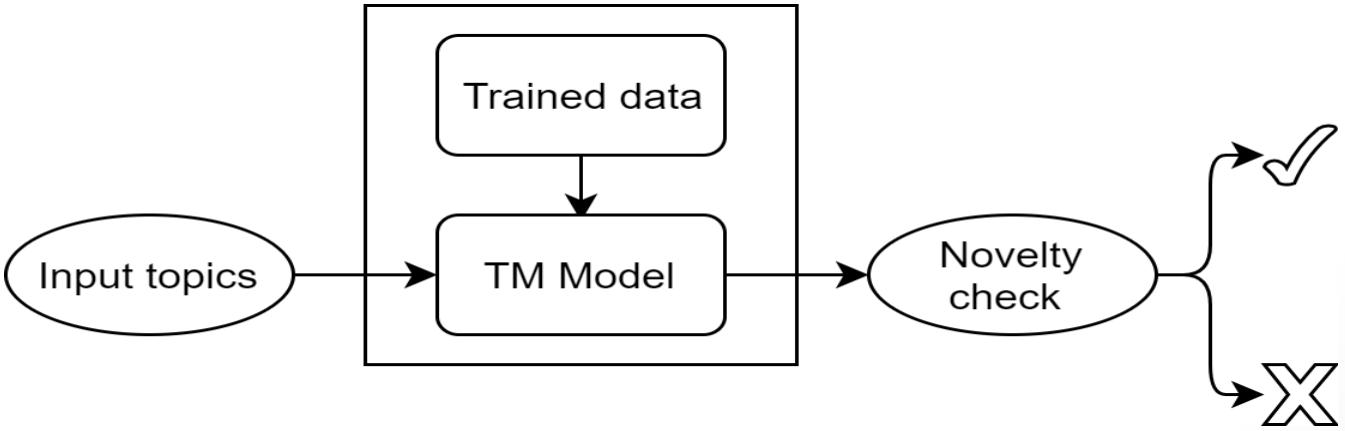
ICT

University of Agder

Novelty Detection

Determine if the given input topic is novel or not

- Novelty detection is a process of recognizing that the test data is novel and somehow differs from the data available during the training time
- Novel topics will reveal themselves by not fitting with a trained model.



Novelty Detection in Chatbots

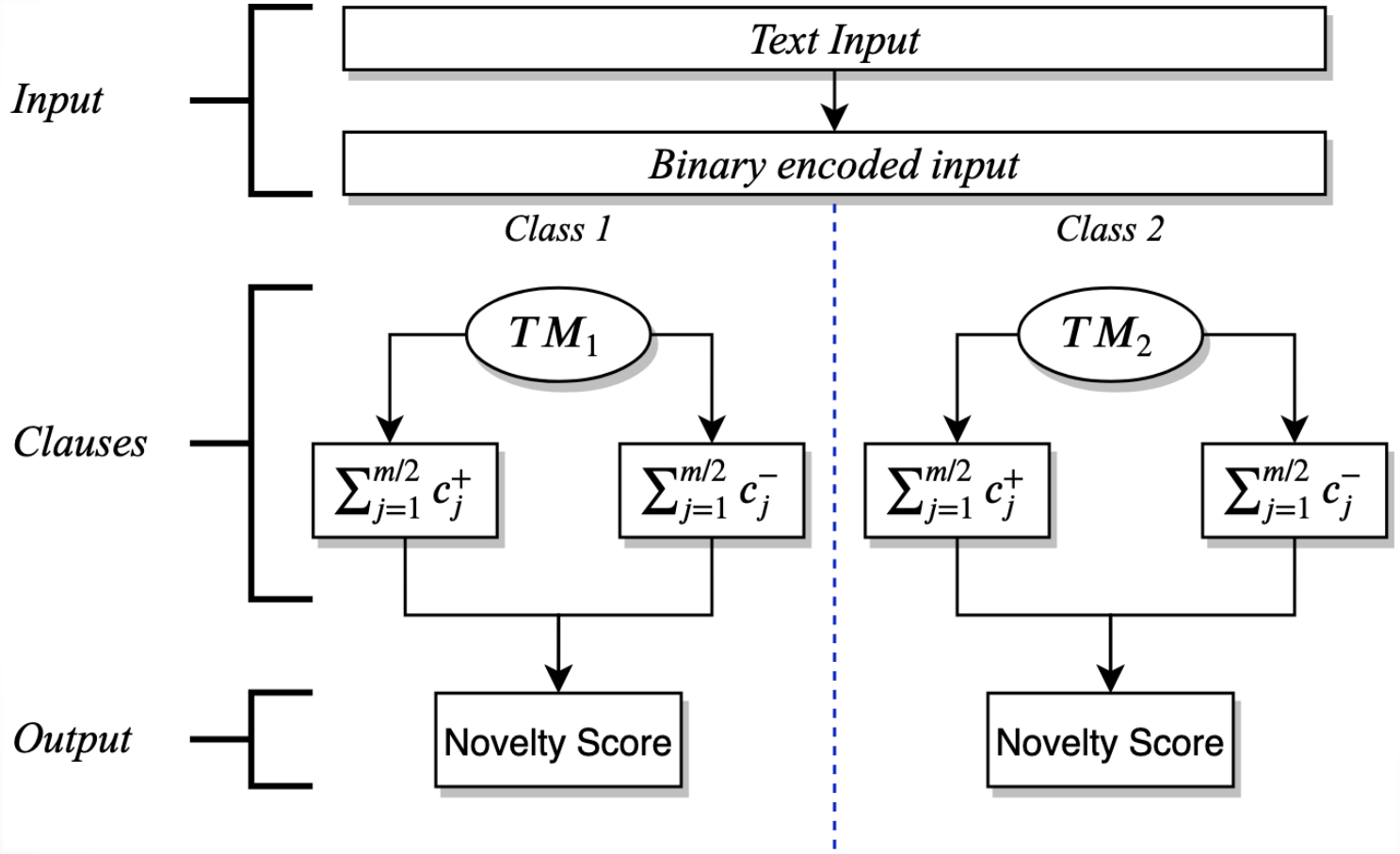
Trained topics: Baseball and Football events
Users Queries: Rugby events (New topic)

Example:
Intent – Who won the rugby match yesterday?
Answer- (can be anything)

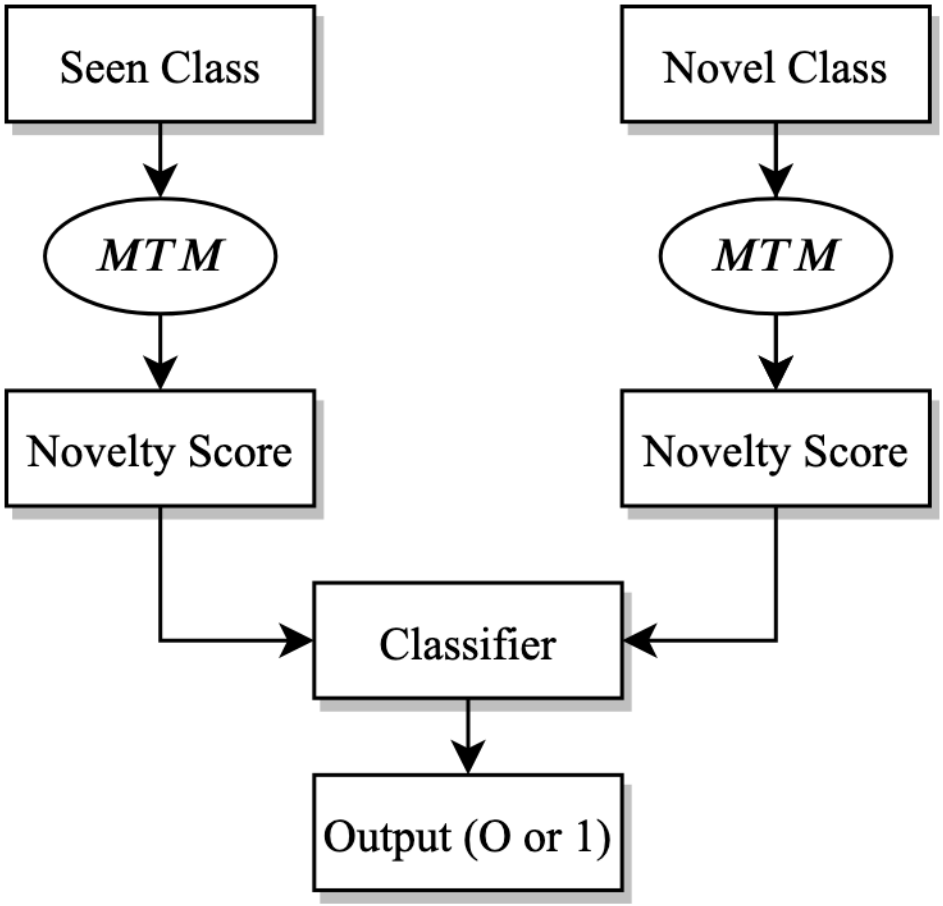
Trained topics: Account and Card queries
Users Queries: Loan (New topic)

Example:
Intent – I have an account in this bank, How can I get a loan?
Answer- (can be anything)

Tsetlin Machine Framework

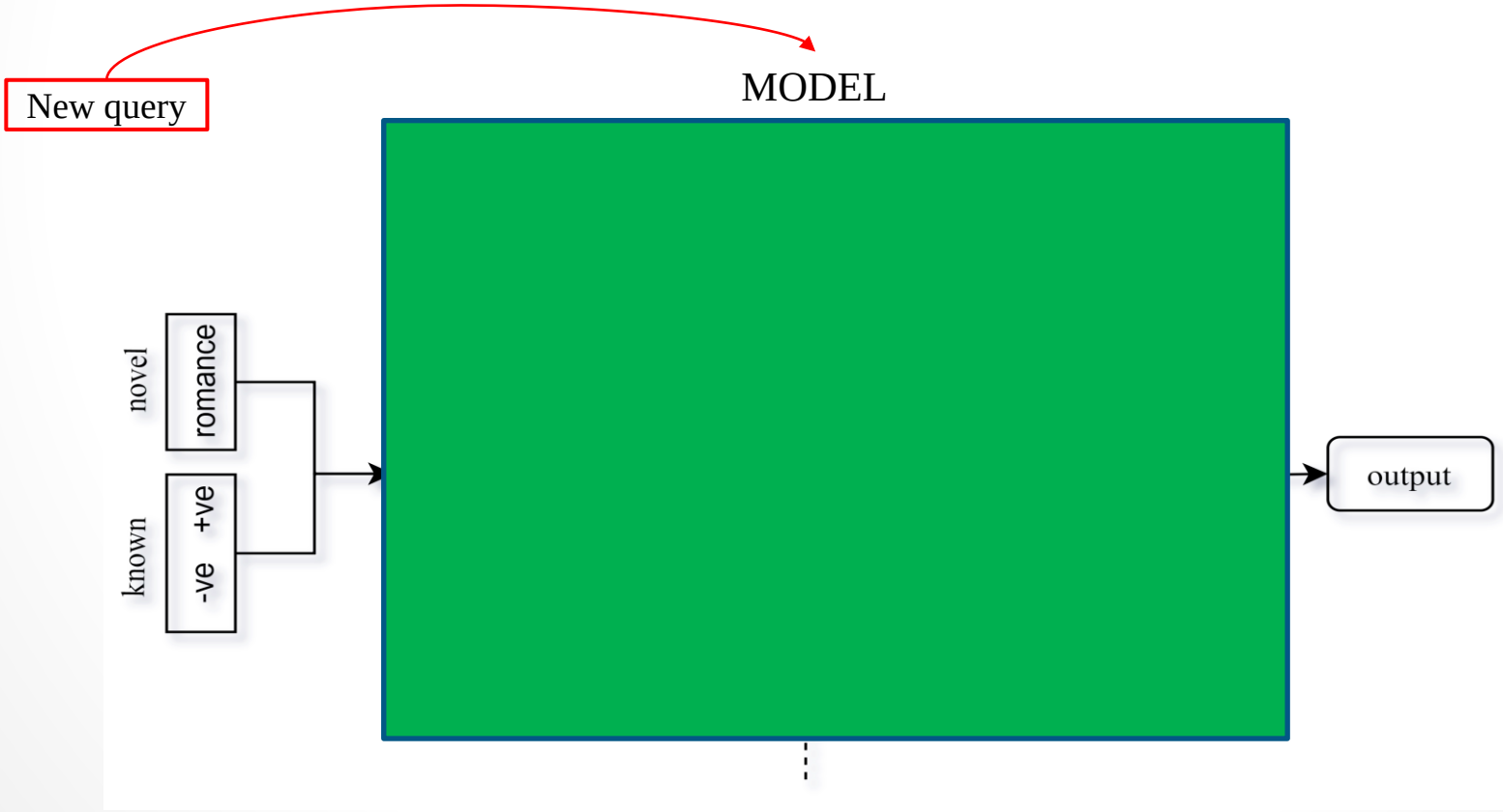


System Architecture



Experiment

- IMDB Dataset
  - Positive (Known)
  - Negative (Known)
  - Romance (Novel)



Results

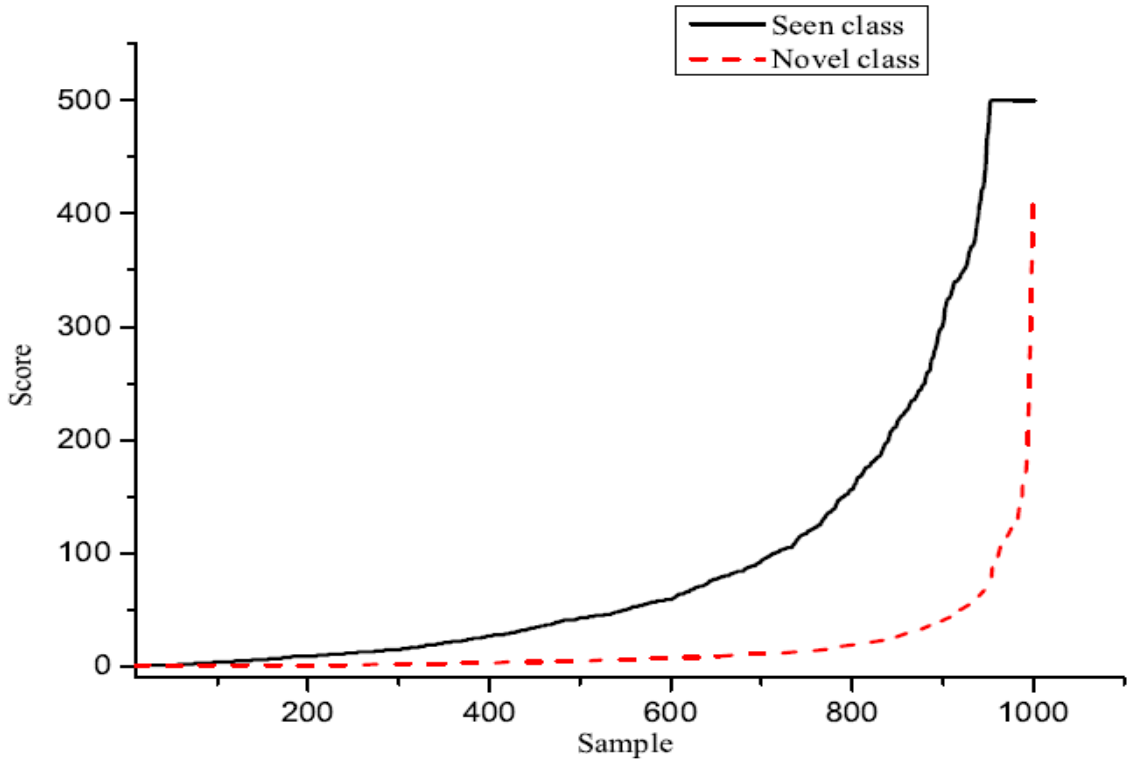
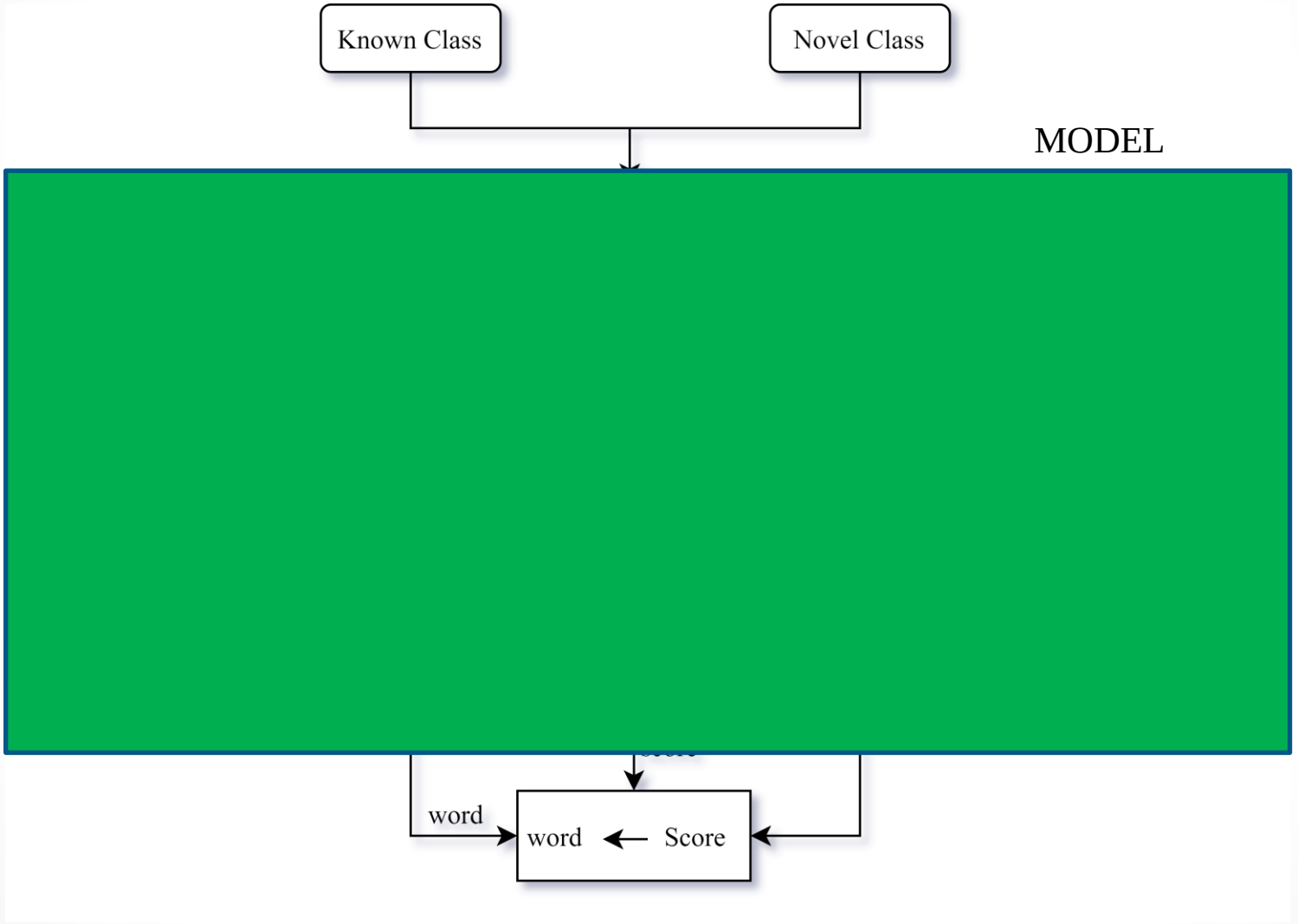


Figure 3: Visualization of differences in novelty score for seen and novel class

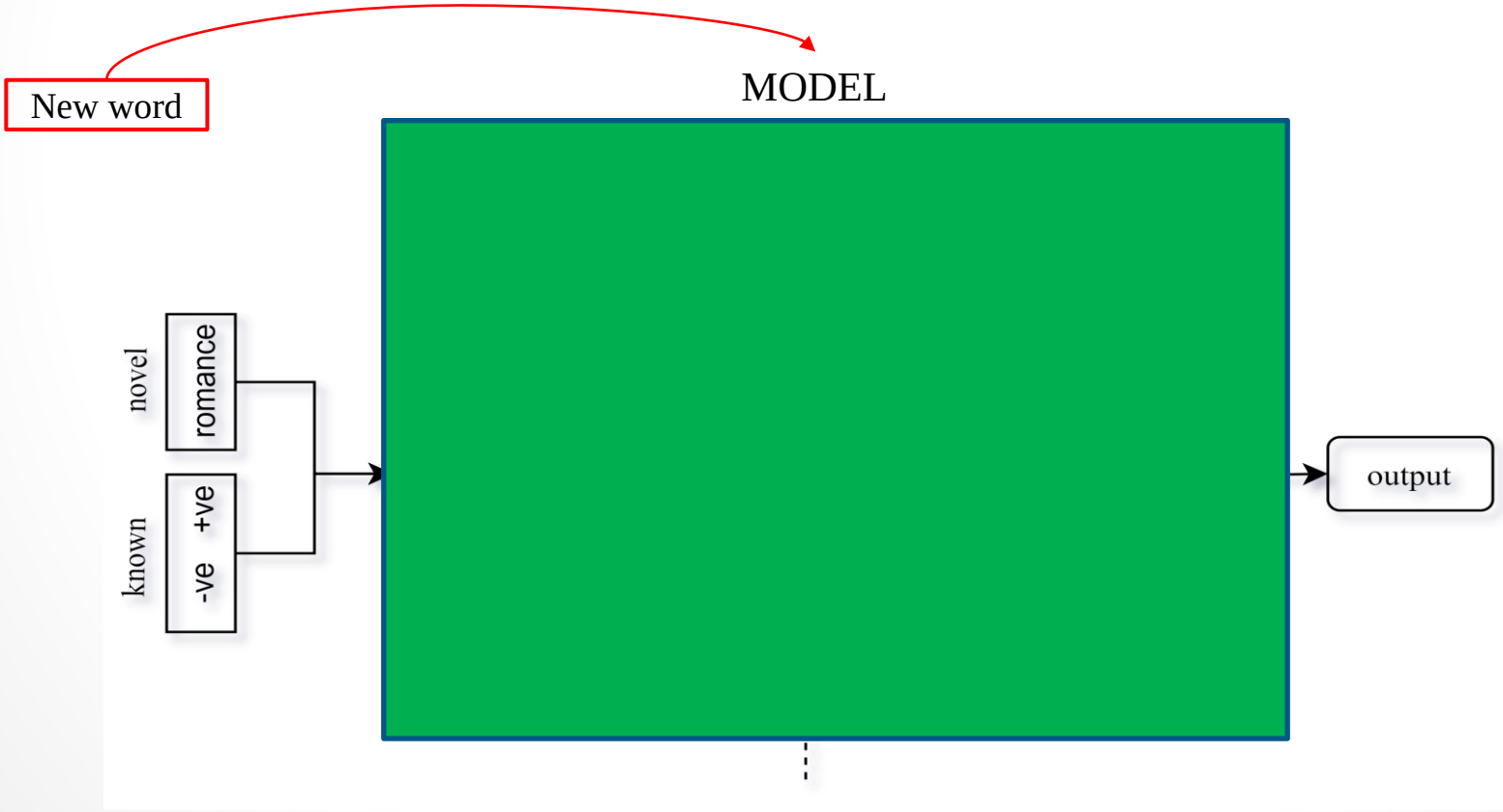
Dataset	KNN	SVM	NB	MLP
IMDB Dataset	65.77 %	70.46 %	63.76 %	**71.81 %**

Table 4: Accuracy of different machine learning classifiers to detect novel class in IMDB dataset.

Next Work: Scoring Framework



- IMDB Dataset
  - Positive (Known)
  - Negative (Known)
  - Romance (Novel)



CAIR CENTRE FOR ARTIFICIAL INTELLIGENCE RESEARCH

Thank you!