

# Computer Vision based Attentiveness Detection API for E-learning

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# Functionalities

## 1. Facial Expression Prediction

- Detecting facial key points, analyzing facial expressions and predicting attentiveness level percentage provided during the e- learning session based on the analyzed facial expressions.
  - Technologies - Keras, Tensorflow
  - Tools - IBM Watson Platform
  - Algorithms - CNN (Semantic segmentation)

# Functionalities

## 2. Body Language and Posture Prediction

- Detecting body key points, analyzing body language and posture and predicting attentiveness level percentage provided during the e- learning session based on the analyzed body movements.
  - Technologies - Keras, Tensorflow
  - Tools - IBM Watson Platform
  - Algorithms - CNN (Semantic segmentation)

# Functionalities

## 3. User Input Prediction

- Detecting user answers (input) to the automatically generated questions, processing user input and analyzing whether the input matches system expected outcome and predicting attentiveness level percentage provided during the e-learning session based on the accuracy of the user input.
- Technologies - Python
- Tools - Natural Language Toolkit (NLTK), Natural Language Processing (NLP)
- Algorithms - Custom algorithms for phrase ranking

# Output

- A notification to the lecturer about students attentive percentage as a combination of all three inputs.
- Using an ensemble prediction using
  - Algorithms - Decision Tree algorithms, Support Vector Machines (2 or 3 based on accuracy)
  - Tools and Libraries - Natural Language Toolkit (NLTK)
  - Technology - ML Supervised Learning
- Applicable for live lectures done online.
- To increase the effectiveness online delivery