Weather forecast using cloud images

• Dataset: Training

SWIMSEG Dataset
1,013 cloud images (many kinds of cloud and sky)

• Dataset: Testing

HYTA Dataset
32 cloud images (many kinds of cloud and sky)

• Architecture

Training

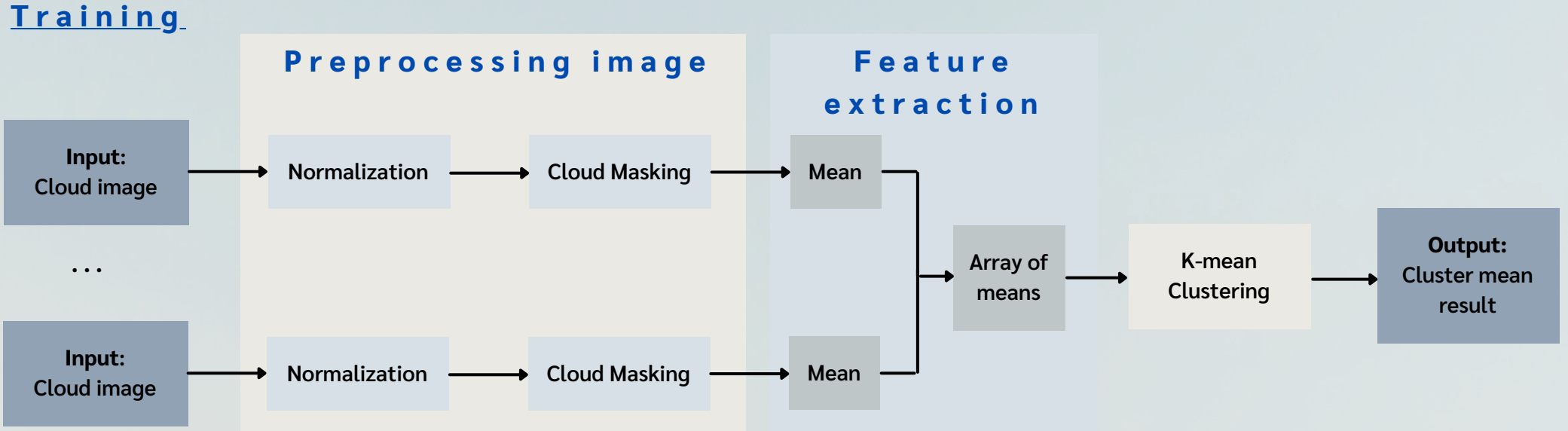
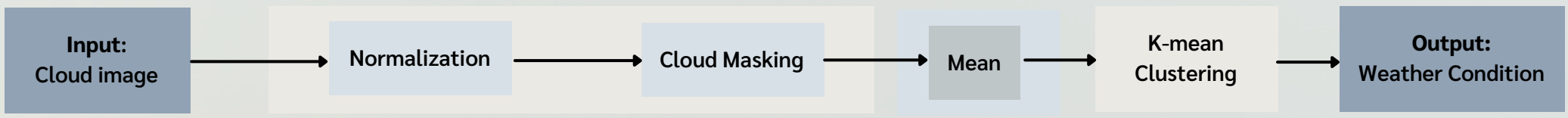


Image Processing Techniques

- Normalization: **Grayscale** (BGR Ratio) **& Arithmetic Operation**
- Cloud masking: **Thresholding** (cv2.THRESH_TOZERO) **& Morphology** (Closing)
- Mean: **Extract average** of cloud area in the image
- K-mean clustering: 3 clusters (**Euclidean distance**)

Testing



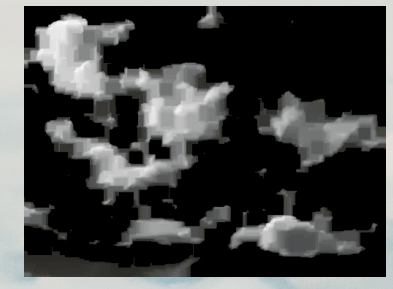
Output

- Weather condition: Sunny/Cloudy/High chance of rain

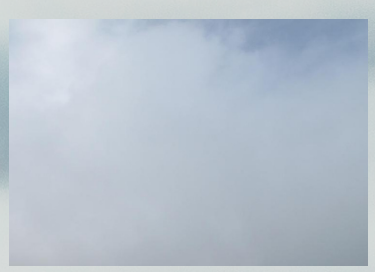
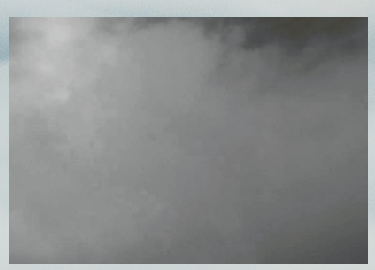
• Result analysis:

Cluster mean result = [[59.346], [112.251], [175.905]]





mean = 121.511 | Cluster 1 | **CLOUDY**


mean = 157.222 | Cluster 2 | **HIGH CHANCE OF RAIN**

If we use preprocessed images for training and testing, we will get 78.125% accuracy of weather prediction, which is higher than using normal images with 62.5% accuracy.

SWIMSEG dataset: https://dataverse.harvard.edu/
HYTA Dataset: https://github.com/Soumyabrata/HYTA/tree/master/images
Code: https://github.com/Zeno-PT/WeatherForcast

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