



Principal Component Analysis

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Introduction : Principal Component Analysis in Image Processing

- ▶ PCA, a Dimensionality Reduction Technique for image data by conserving the critical features
- ▶ Key features : Eigen Faces, Eigen Values, Eigen Vectors
- ▶ Applications in Machine Learning, Image Processing and Computer Vision

Objectives

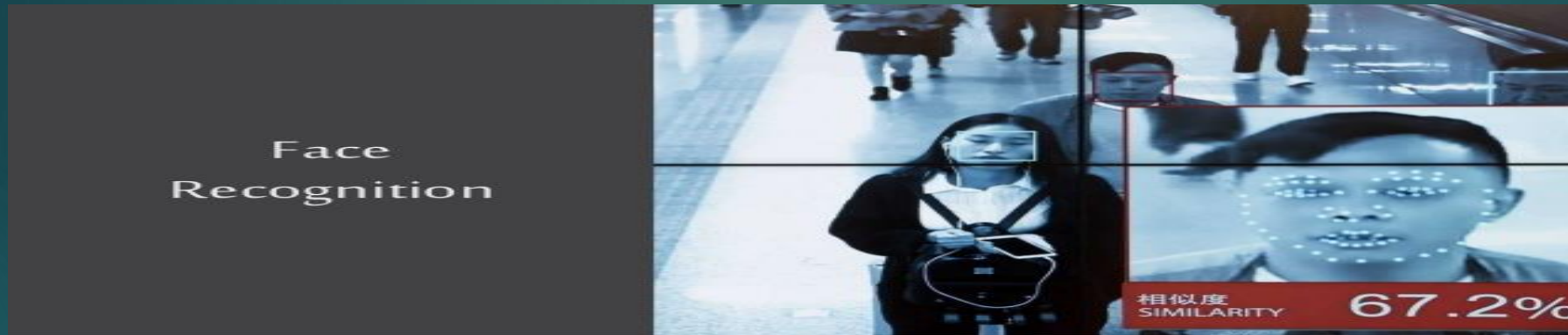
- ▶ To apply the PCA mechanism to reduce the dimensions of Image Data by also retaining the significant features
- ▶ To Achieve Computational Efficiency
- ▶ To Improve the Effectiveness of Classification and Recognition Algorithms

Background and Motivation

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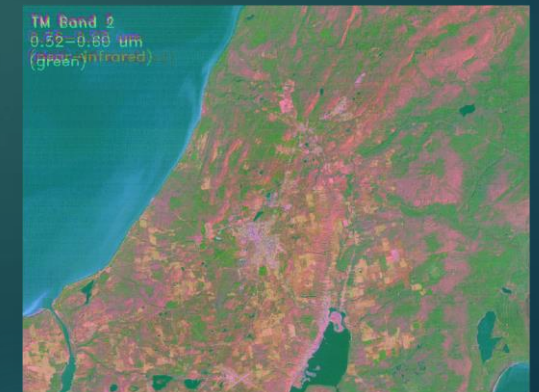
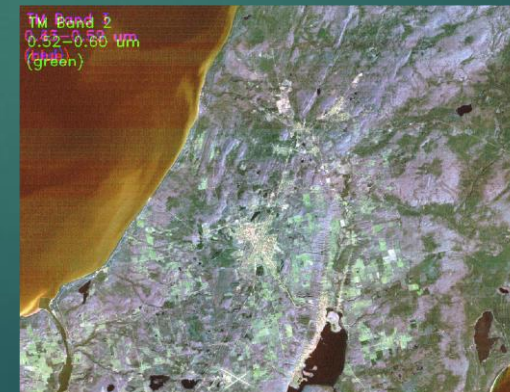
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- ▶ Face Recognition using PCA (Code Heroku, 2019)



Comparison of RGB image and principal components composite image

- ▶ PCA testing on Image Data (Kumar,2020)



Implementation and Mechanism

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- ▶ Eigen Values Computation
- ▶ ORL Dataset

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Conclusion

- ▶ Limitations:
 - ▶ Only for Image Files
 - ▶ Accuracy of ORL Data Set (93% Approx.)
- ▶ Enhancement:
 - ▶ To work on Video Files
 - ▶ To Work on Large Data Sets

Thank You 🙏