**Face Recognition Independent of Facial Expression**

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**Goal:** Face recognition under varying facial expressions for surveillance and security.

**Approach:** Higher-Order Singular Value Decomposition (HOSVD) for facial expression decoupled face recognition.

- **HOSVD:** $A = S \times U_{person} \times U_{expression} \times U_{feature}$

**Facial Features:**
- Appearance
- Critical Features Points

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**Obtain expression tensor and person tensor:**

\[
T_{person} = S \times U_{person} \times U_{feature}
\]

\[
T_{expression} = S \times U_{expression} \times U_{feature}
\]

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**Results:**

- Obtain expression vector and person vector:
  
  \[
  u_{person} = \text{unfolding}(T_{test}^{1})^T \cdot (\text{unfolding}(T_{expression}^{i,1}))^{-1}
  \]
  
  \[
  u_{expression} = \text{unfolding}(T_{test}^{2})^T \cdot (\text{unfolding}(T_{person}^{i,2}))^{-1}
  \]

**Expression:**

1. happiness
2. sadness
3. fear
4. anger
5. surprise
6. disgust
7. neutral

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