CONSTRANDED AND PARAMETRIC DYNAMIC PROGRAMMING FOR WORD IMAGE RETRIEVAL

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INTRODUCTION

⇒ Dynamic Time Warping (DTW) based similarity matching has been highly used for word image matching
⇒ Constrained DTW performs better than classical DTW, hence can avoid pathological matching
⇒ Several variants of DTW can perform better compared to classical DTW

CONTRIBUTION

⇒ Demonstrated the combination of these variants of DTW improves results
⇒ Propose to combine Pseudo local DTW (LDTW) with Itakura Parallelogram
⇒ Several other matching techniques are combined to study their potential advantages
⇒ Propose technique to compute weighting parameter to combine two matching techniques

PARAMETRIC COMBINATION

⇒ Parametrically combine different dynamic programming based sequence matching techniques
⇒ Introduced for time series matching but adapted here for word image matching

Algorithm 1: LDTW + ITAKURA PARALLELOGRAM

Input: \( q, D \)
Output: \( D_{p,q} \)

1. for \( i = 1 \) to \( p \)
2. for \( j = 1 \) to \( q \)
3. \( d_{ij} = |I_{i,j} - LDTW(i,j,\Delta)\)
4. \( D_{p,q} = D_{p,q}/|w_{a}| \)
5. return

PRUNING TECHNIQUES

⇒ The target images satisfies Criterion-1 and Criterion-2 or Criterion-3 are considered as relevant

\[ \frac{1}{2} \geq \text{query aspect ratio} \geq \text{target aspect ratio} \geq \frac{2}{1} \geq \text{query area} \geq \text{target area} \geq \frac{2}{1} \geq \frac{X}{Y} \text{ of query} \geq \frac{X}{Y} \text{ of target} \geq \frac{2}{1} \]

REFERENCES