Detecting Reduplication in Videos of American Sign Language

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**Motivation**

- computational significance
  - automated ASL recognition
  - sign segmentation
  - storage and retrieval
- linguistic significance
  - overt marking of plurality on nouns
  - aspectual inflection on verbs
  - nominalization of verbal forms

**Approach**

- Tracking
- Feature Extraction
- Codebook
- Sim. matrix
- Apriori
- Candidate Generation

**Algorithm**

Input:

\[ S, w = S_{078618775618784525}, w = [0.06, 0.07, 0.03, 0.01, 0.07, 0.06, 0.03, 0.02, 0.07, 0.05, 0.04, 0.08, 0.18] \]

**Apriori algorithm:** efficiently finding repeated patterns in data streams (Agrawal et al., 1993)

**Apriori property:** frequency of a pattern in bounded above by the frequencies of its subpatterns

EVALUATION

Sample results:

- Input 0536556366026367235872366372358318
- Detected patterns 3'632' '638' '632' '638' '638'
- Cost Measure 18
- Validation Measure 18
- Cumulative Value 18
- Cumulative Cost 18

**Corpus:**

- National Center for Sign Language and Gesture Resources (NCLGR) Corpus*
- 105 lexical signs: 84 with reduplication, 21 without
- 2 native signers, 11 separately recorded videos (RGB, grayscale)

* a collection of ASL videos collected at Boston University from native signers and linguistically annotated using SignStream™ (Neidle, 2002)

http://www.bu.edu/asltp

- more complete hand representations (add articulation parameters)
- better localization of hands in space (e.g. kinect for depth)

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