

AUTOMATIC RETRIEVAL OF VIDEOS OF STEREOTYPY BEHAVIOR

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Motivation

- Collecting a large corpora of video data has become common practice among researchers and clinicians studying autism.
- Many individuals with autism exhibit stereotypes and other repetitive behaviors
- Manually identifying relevant behaviors in a large video collection is a labor-intensive process.

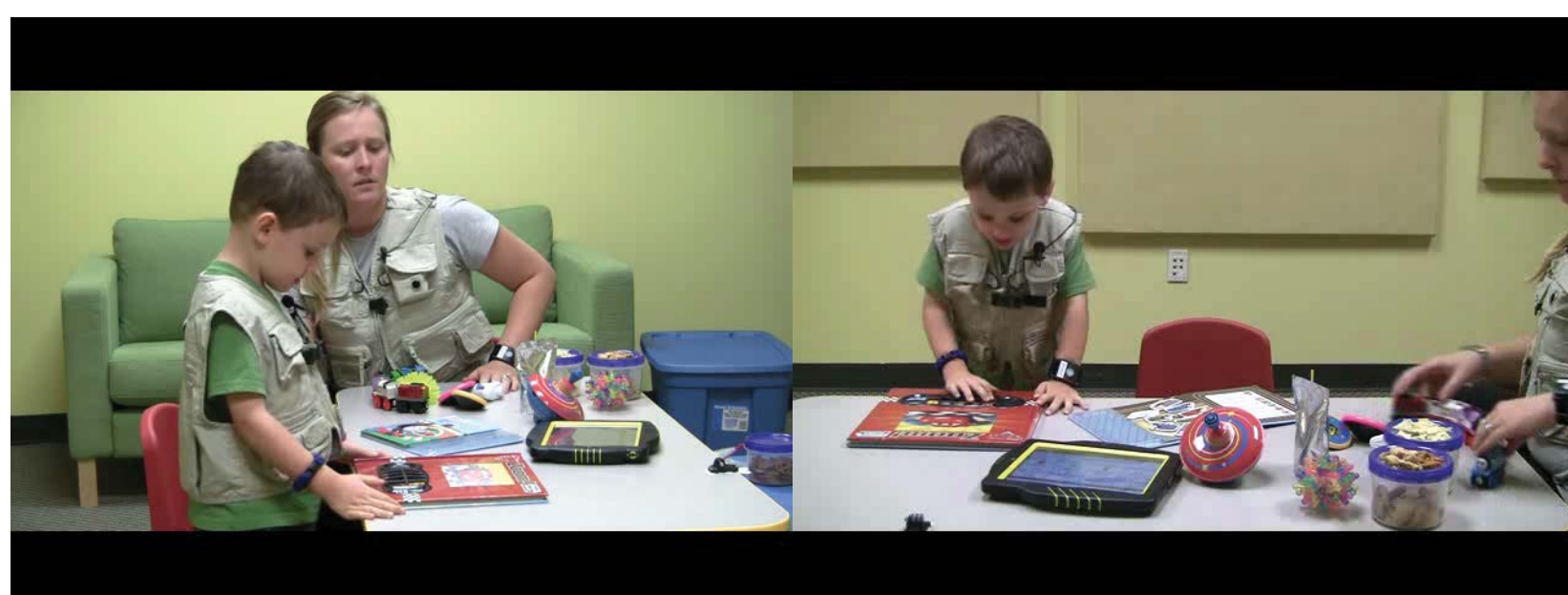
Goal

Make it easier to find relevant behaviors in video collections, by means of a tool that can automatically retrieve gross motor physical stereotypes given a single video example identified by the user.

Results

Dataset 1

- 20 minute long videos from 2 viewing angles.
- A single child exhibited three repetitive behaviors (escape, jump, handflap).



Dataset 1 Results

	@20	@10	@5
Escape	77%	50%	30%
Jump	45%	28%	15%
Flap	31%	18%	8%

Escape Example

50% @ 10

50%  @10

50%  

The algorithm ranks **all input windows**. The top 10% (@10) contain 50% of the escape behaviors (**detected** escape windows), the bottom 90% contains the other 50% of **missed** escape windows

Dataset 2

- 20 min video of a single child captured from a ceiling camera, at the Center for Discovery in Harris, NY
- 4 instances of self injurious behavior (jumping up from chair landing forcefully down on tailbone)
- Using one example as the query, additional instances were found at rank 7 and 8 (out of 2000).



Approach

Method Overview



Features

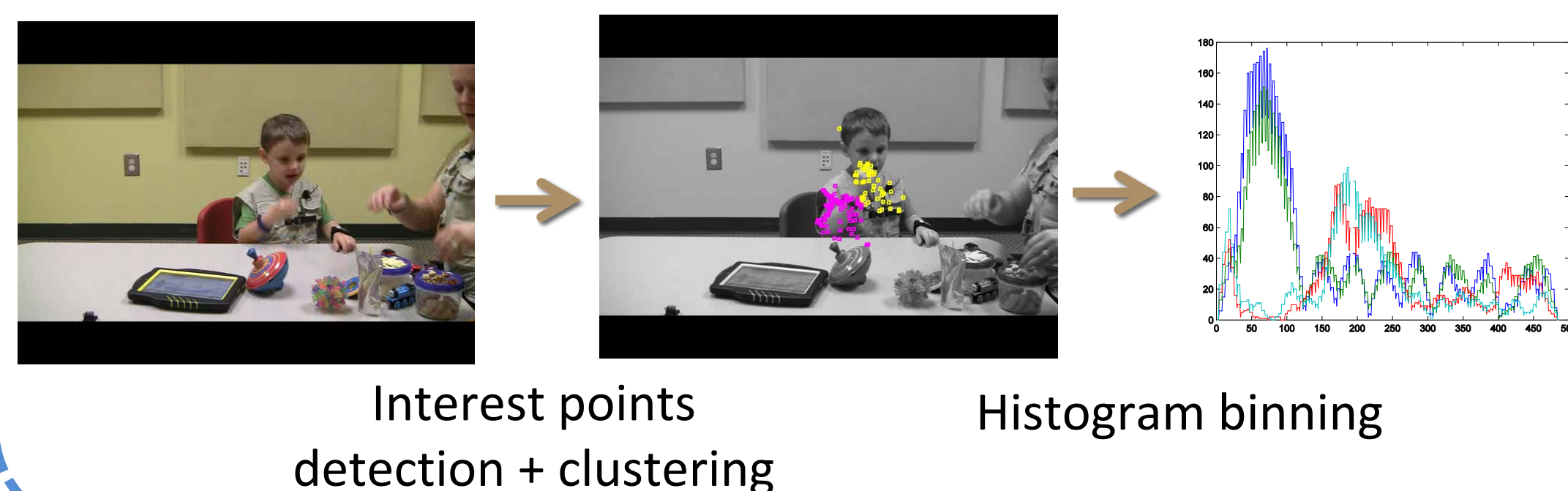
Features

Score similarity

Ranked Output



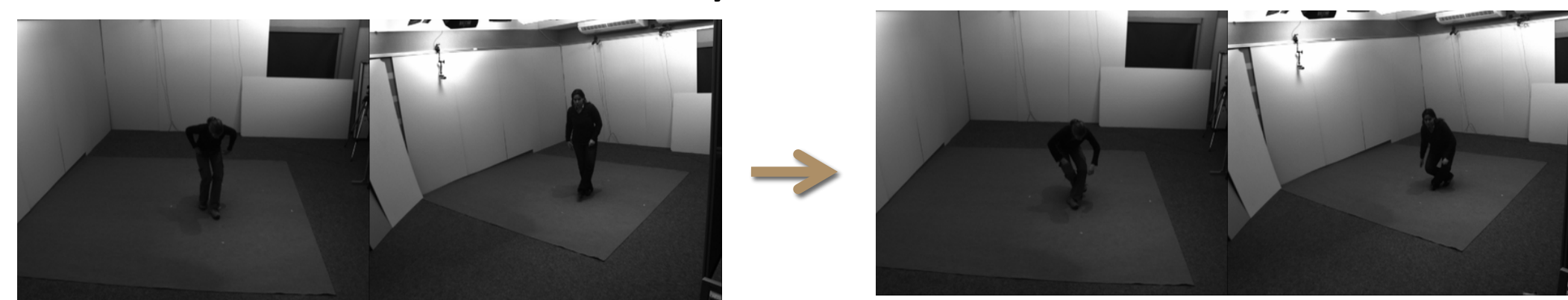
Feature extraction: *movement pattern histogram*



Interest points
detection + clustering

Histogram binning

Video Synchronization



Score Video Similarity by Histogram Approximation

