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KAUST

Diagnosing Error in Temporal Action Detectors

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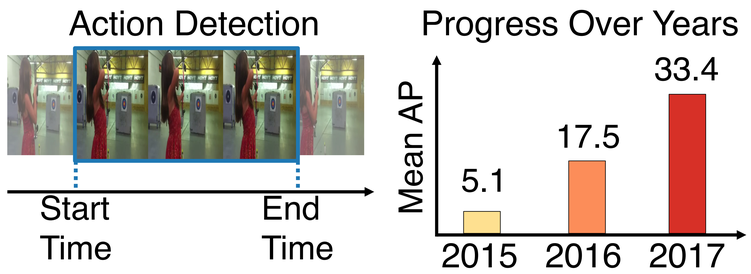
goo.gl/dMRQMM

Introduction

Using a **single scalar metric** to evaluate action detectors **does not allow** us to see the big picture

- What are the strengths and weaknesses of detectors? How can they be improved?
- What makes an action hard to detect?



Contribution: a new methodology to **diagnose** action detectors on **ActivityNet** and **THUMOS14**

Recommendations

1. Next generation action detectors should focus on fixing **localization errors**.
2. The uncertainty of **temporal boundaries** is not impeding the development of better algorithms.
3. We need algorithms that can better handle **temporal context** around action instances.

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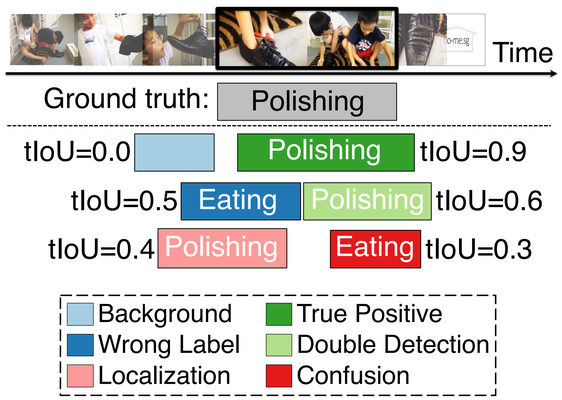
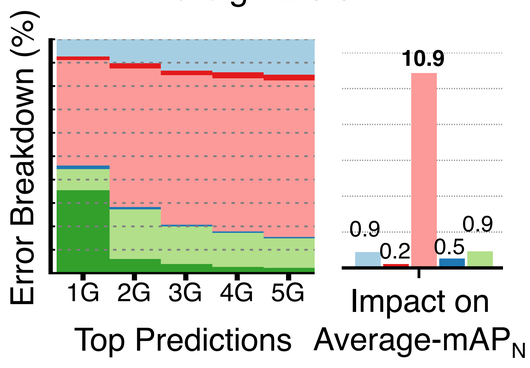
Impact of False Positive Errors

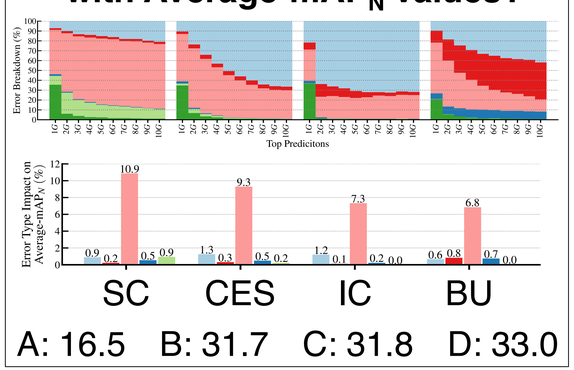
FP Categorization



Localization errors are a big hurdle



Can you match the FP profiles with Average-mAP$_N$ values?



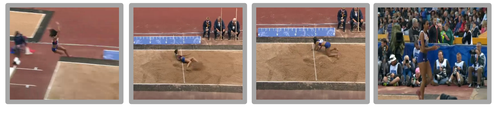
False Negative Errors and Sensitivity Analysis

Let's play some games

1. What action could happen next?

a) Baking cookies b) Rock climbing c) Bungee jumping

2. When does "Long jump" end?

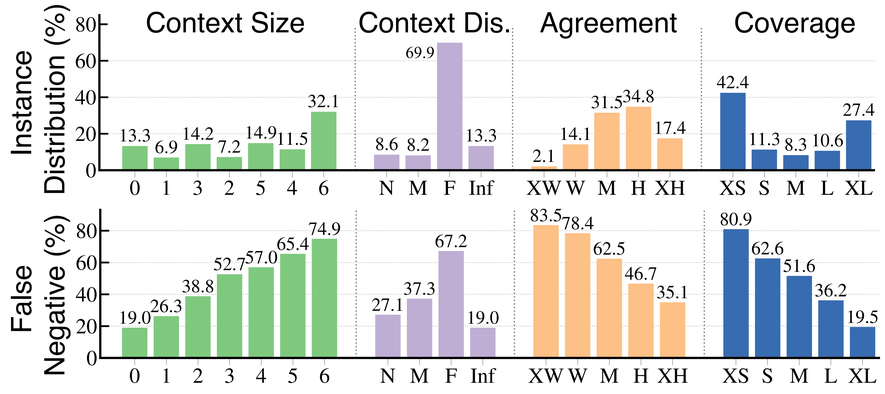


A B C D

Check our demo!

By **characterizing** the dataset, our analyses show:

1. Instances with **large context** are hard to detect (high context size)
2. Algorithms are very **sensitive** to coverage and context size



Average-mAP$_N$ Sensitivity