Automatic Video Annotation

Video annotation with Q/A

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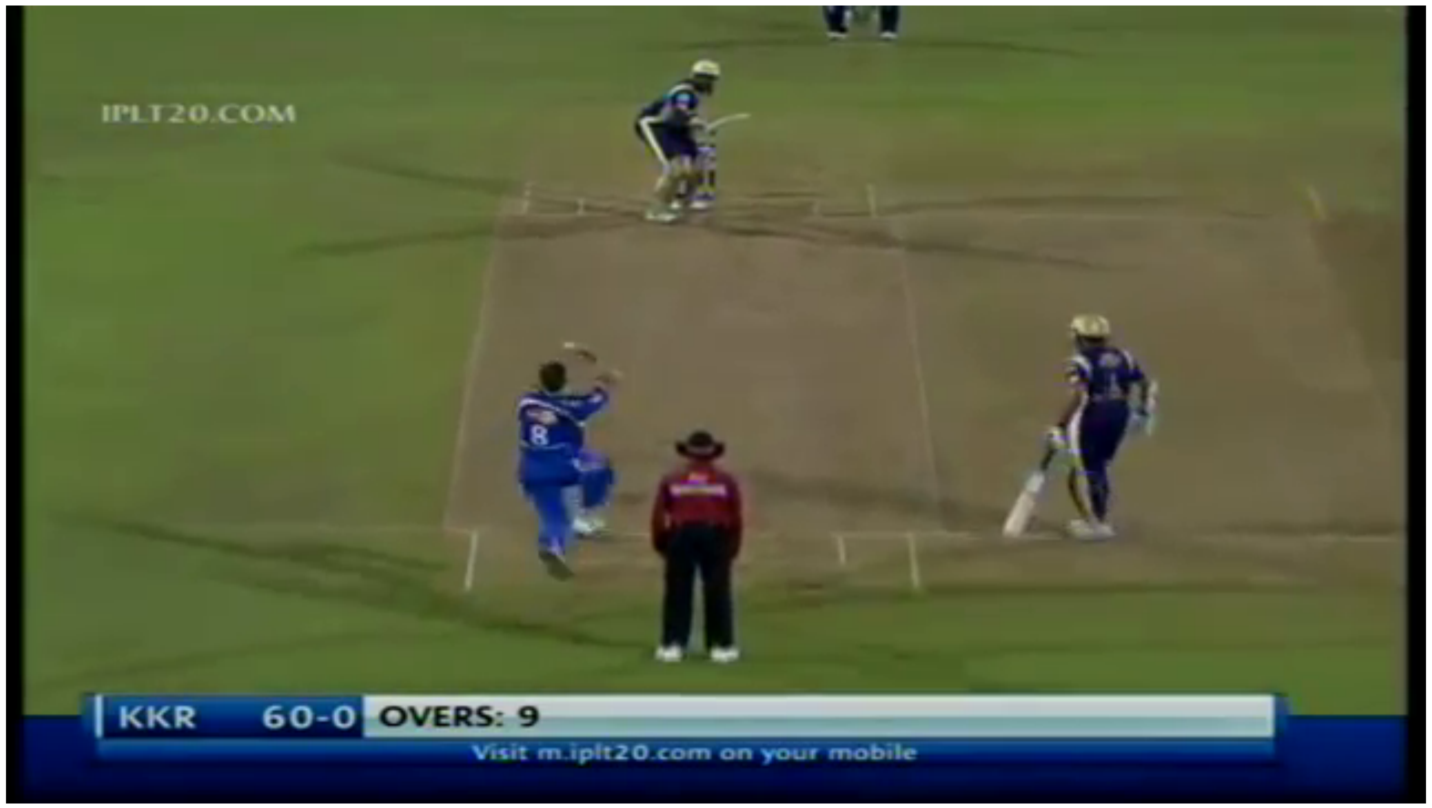
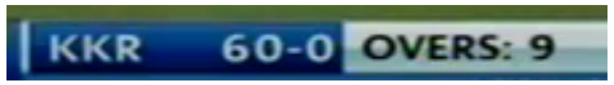
Video Annotation

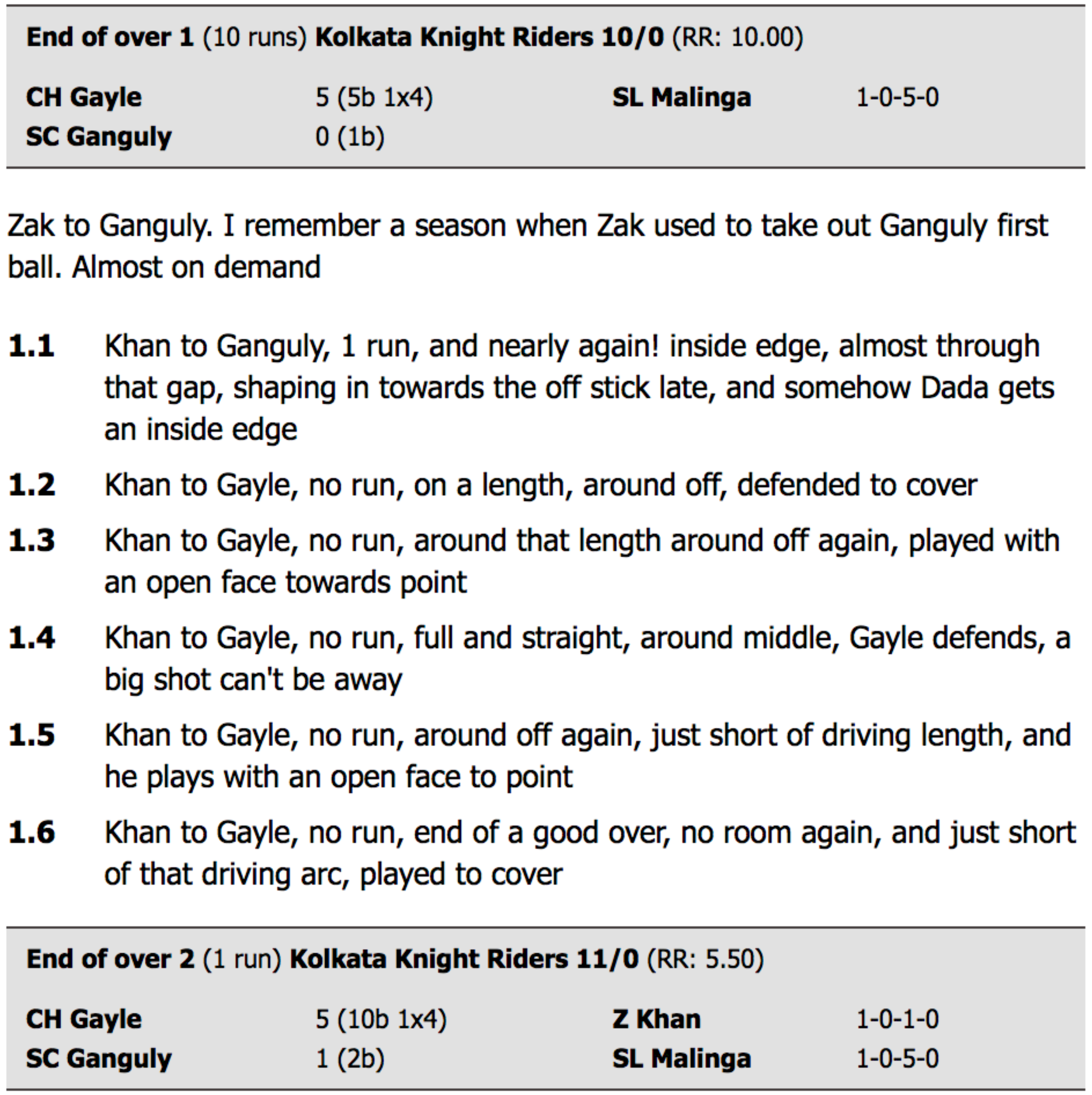


Python Imaging Library (crop function)



Google Vision OCR API

KKR 60-0



End of over 1 (10 runs) **Kolkata Knight Riders 10/0** (RR: 10.00)

CH Gayle	5 (5b 1x4)	**SL Malinga**	1-0-5-0
SC Ganguly	0 (1b)		

Zak to Ganguly. I remember a season when Zak used to take out Ganguly first ball. Almost on demand

1.1 Khan to Ganguly, 1 run, and nearly again! inside edge, almost through that gap, shaping in towards the off stick late, and somehow Dada gets an inside edge

1.2 Khan to Gayle, no run, on a length, around off, defended to cover

1.3 Khan to Gayle, no run, around that length around off again, played with an open face towards point

1.4 Khan to Gayle, no run, full and straight, around middle, Gayle defends, a big shot can't be away

1.5 Khan to Gayle, no run, around off again, just short of driving length, and he plays with an open face to point

1.6 Khan to Gayle, no run, end of a good over, no room again, and just short of that driving arc, played to cover

End of over 2 (1 run) **Kolkata Knight Riders 11/0** (RR: 5.50)

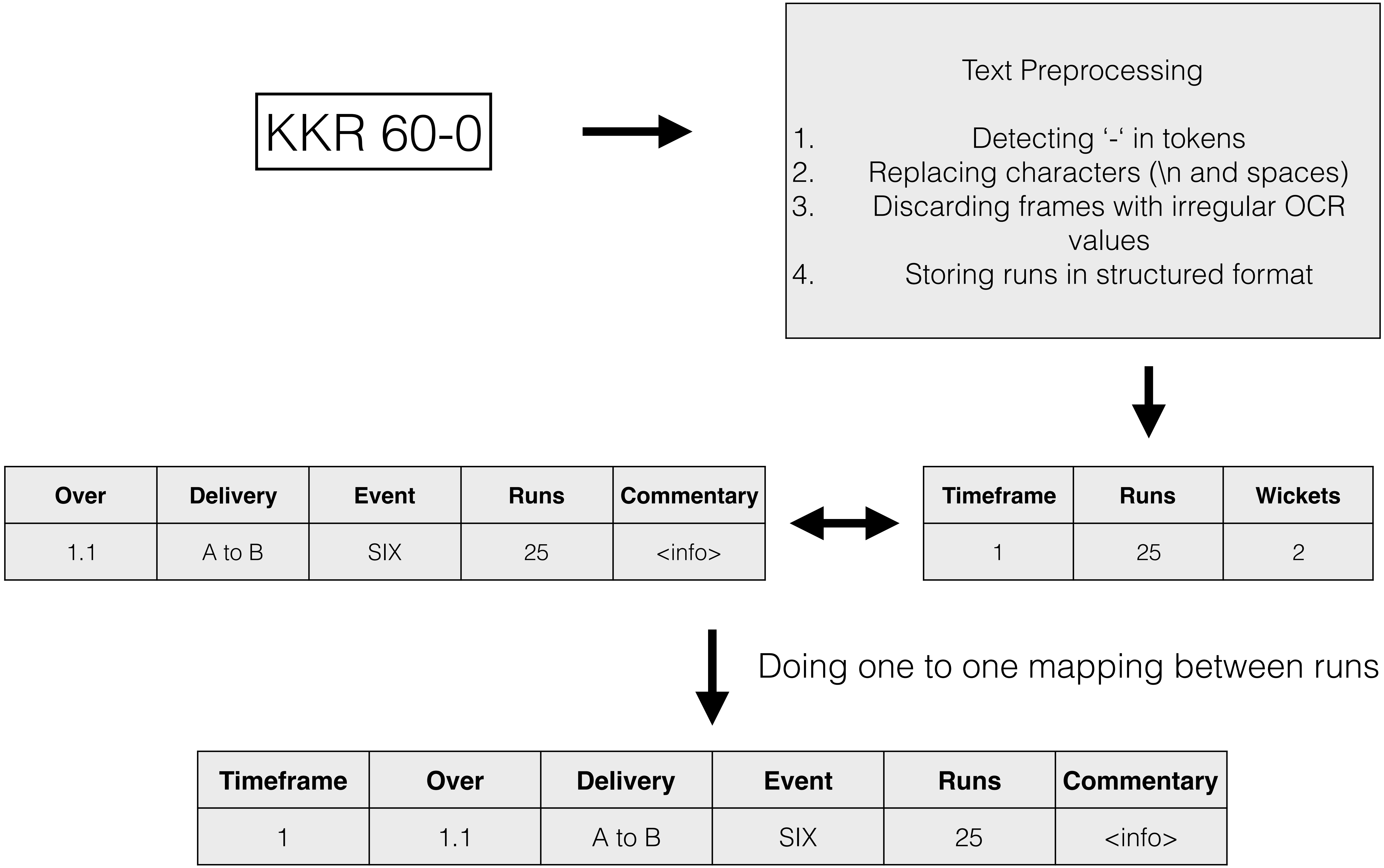
CH Gayle	5 (10b 1x4)	**Z Khan**	1-0-1-0
SC Ganguly	1 (2b)	**SL Malinga**	1-0-5-0

$\longrightarrow$

Events
no run
1 run
2 run
3 run
FOUR
SIX
1 run, bye
1 run, wide
1 run, no ball
OUT

$\downarrow$

Over	Delivery	Event	Runs	Commentary
1.1	A to B	SIX	25	<info>



Text Preprocessing

1. Detecting ‘-‘ in tokens
2. Replacing characters (\n and spaces)
3. Discarding frames with irregular OCR values
4. Storing runs in structured format

Over	Delivery	Event	Runs	Commentary
1.1	A to B	SIX	25	<info>

Timeframe	Runs	Wickets
1	25	2

Timeframe	Over	Delivery	Event	Runs	Commentary
1	1.1	A to B	SIX	25	<info>

Video Annotation

- Resulting data frame from above steps is a synchronized frame on the basis of score (runs)
- We checked that one-to-one mapping works best for such synchronization
- For each ball, we have the timestamp in the video and outcome of that ball
    - Some outcomes: FOUR, SIX, no run, 1 run etc..

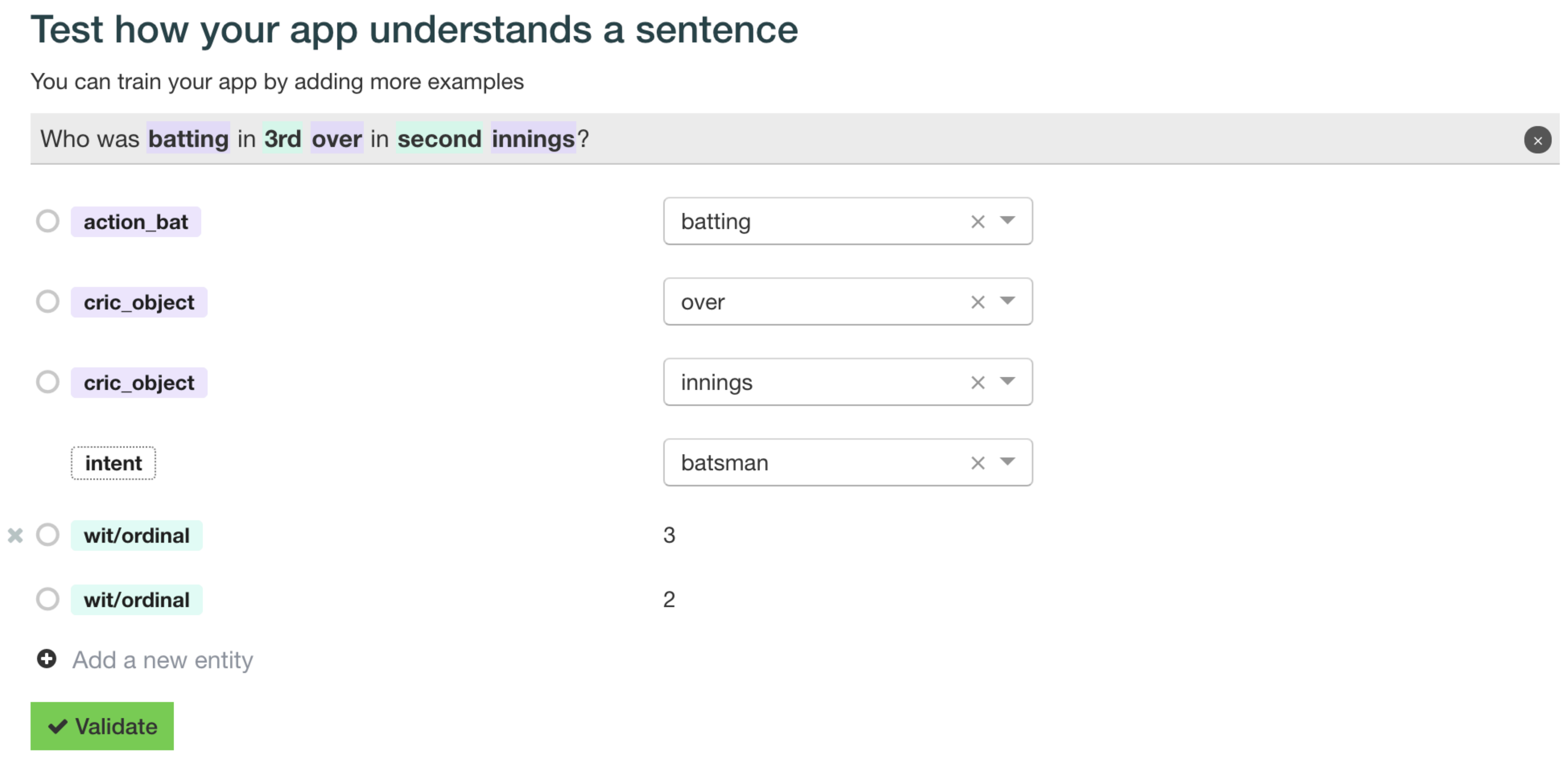
Querying data frame

- We use a conversational bot to query our data
- We use wit.ai to define entities and intents based on our set of questions
- wit.ai fine tunes its NN parameters for our specific questions
- With just a few training questions, we are able to detect various entities and intents in our questions

Querying data frame

- wit.ai is an event and intent parser
- We send a question to this bot, it parses the intent and entities and returns them in a JSON

wit.ai - intent parser (conversational bot)



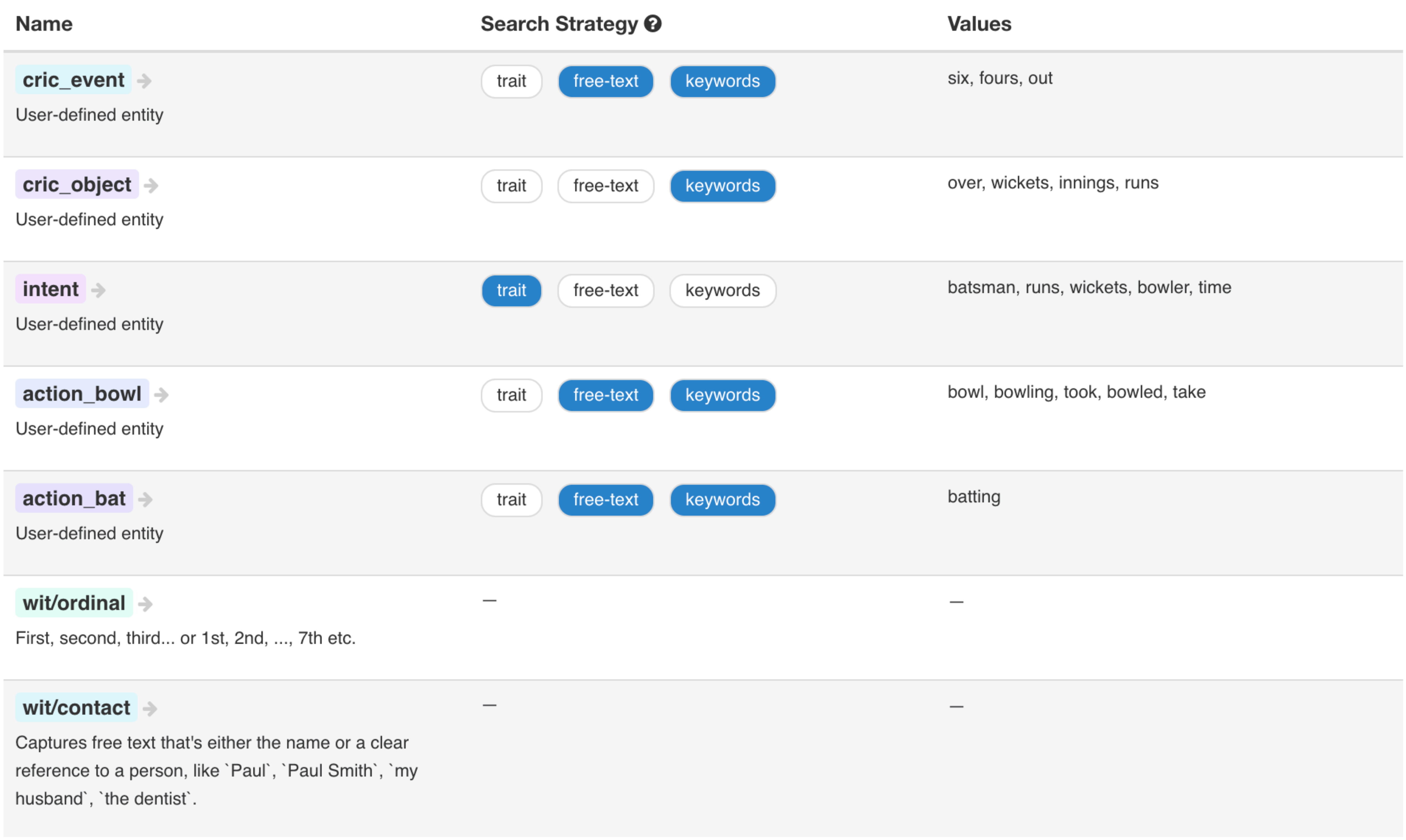
Test how your app understands a sentence

You can train your app by adding more examples

Who was **batting** in **3rd** **over** in **second** **innings**?

action_bat	batting
cric_object	over
cric_object	innings
intent	batsman
wit/ordinal	3
wit/ordinal	2

wit.ai - intent parser (conversational bot)



Name	Search Strategy	Values
cric_event User-defined entity	trait [✓ free-text] [✓ keywords]	six, fours, out
cric_object User-defined entity	trait free-text [✓ keywords]	over, wickets, innings, runs
intent User-defined entity	[✓ trait] free-text keywords	batsman, runs, wickets, bowler, time
action_bowl User-defined entity	trait [✓ free-text] [✓ keywords]	bowl, bowling, took, bowled, take
action_bat User-defined entity	trait [✓ free-text] [✓ keywords]	batting
wit/ordinal First, second, third... or 1st, 2nd, ..., 7th etc.	–	–
wit/contact Captures free text that's either the name or a clear reference to a person, like `Paul`, `Paul Smith`, `my husband`, `the dentist`.	–	–

wit.ai

- We use intent from results of our request to wit.ai to detect kind of questions:
    - How many, when, who, where, how?
- Based on that intent, we return appropriate values from our data frame

Jumping to timestamps

- We use webbrowser python module to jump open URLs to YouTube time-specified points.
- Questions: When did Ganguly hit a four?
  - Multiple timestamps, we open each point in new tab

Complex queries

- We have also handled contextual queries:
  - How many runs did Ganguly score?
  - Who was bowling in first over in first innings?
  - Who bowled out Tendulkar?
    - All work!

Demo