

SportsTrack

1st Place Solution to SportsMOT Track of DeeperAction Challenge 2022

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BOE AIoT CTO

BOE

- Overview
- Pipeline
- Details & Analysis
- Conclusion

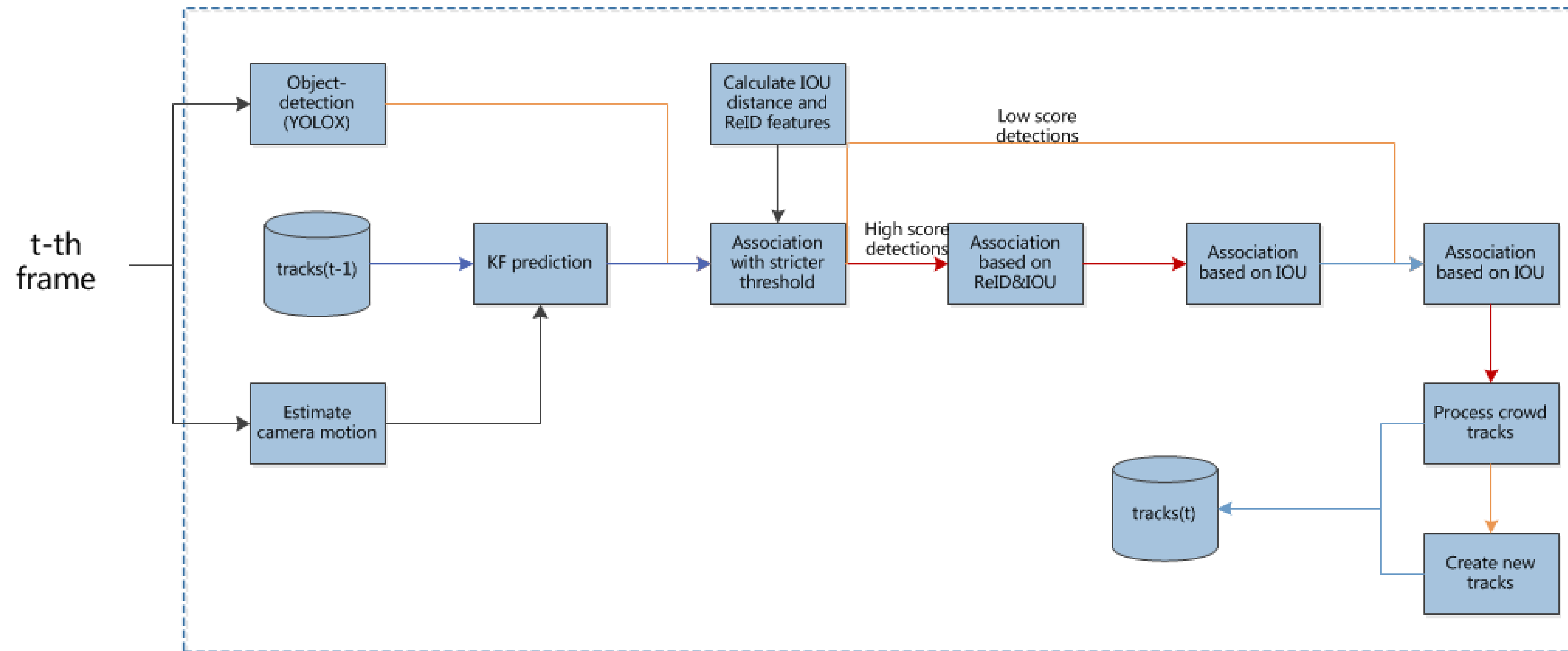
□ Target

- Track athletes in sports scene

□ Challenge

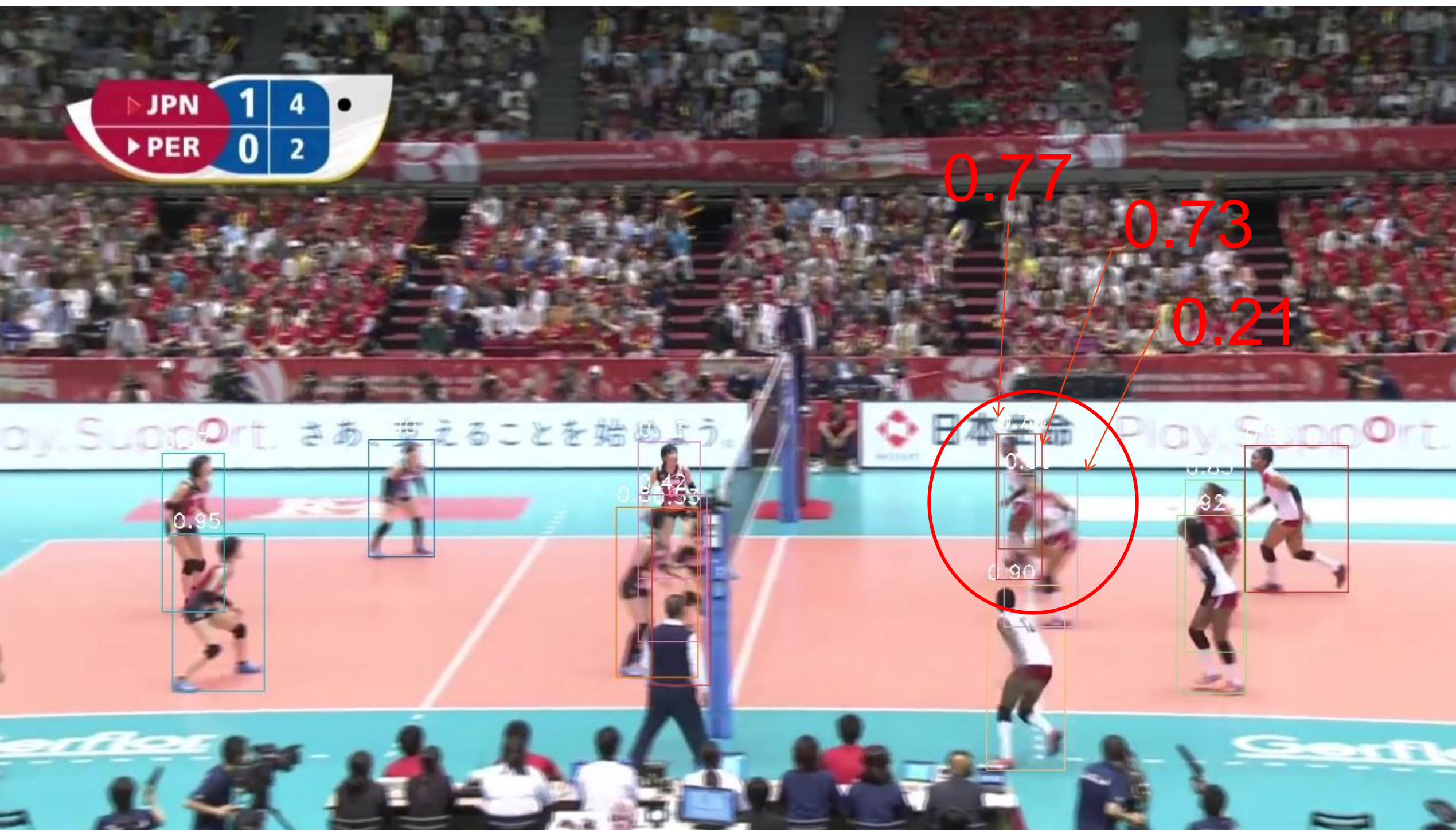
- Background is complicated
- Players possess rapid motion
- The camera lens moves fast
- Include different sport scenes



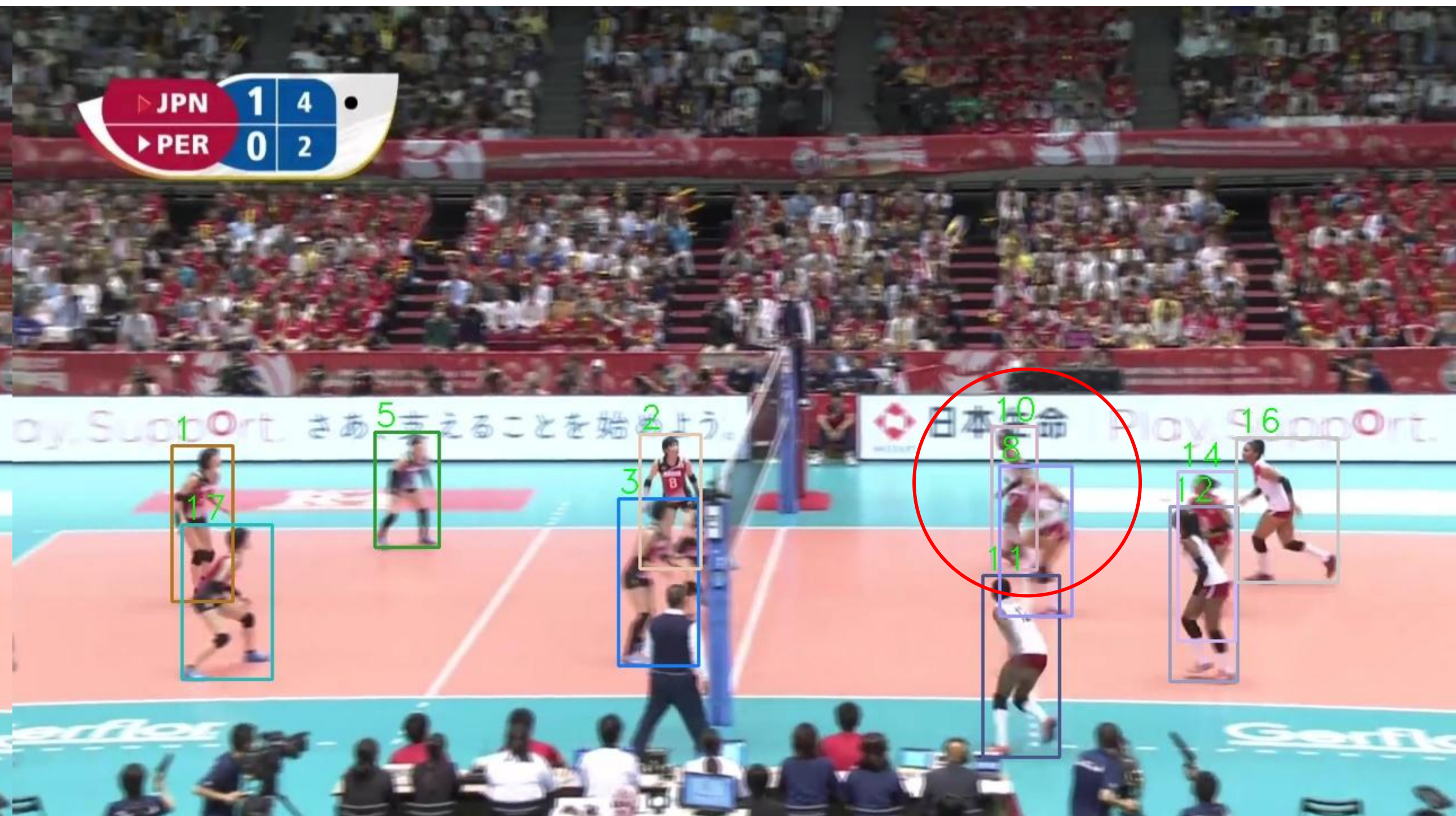


1. State-of-the-art three-stage matching strategy: (1) using all detection targets to match with the tracking objects, but using a stricter threshold (2) matching using high-confidence detection bboxes (3) matching using low-confidence detection bboxes.

Detections

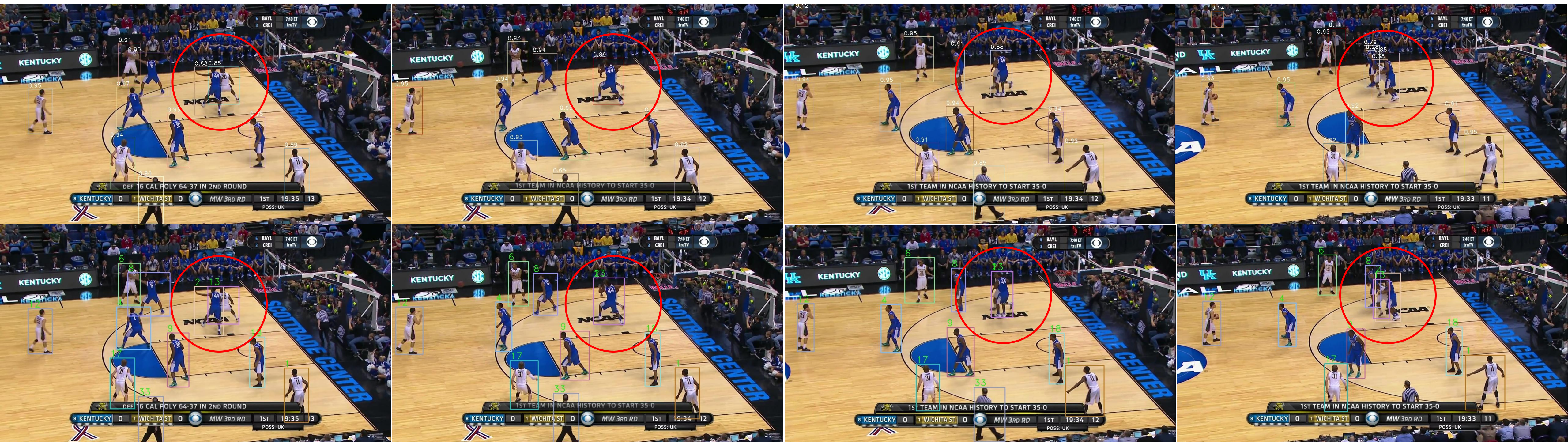


Tracks



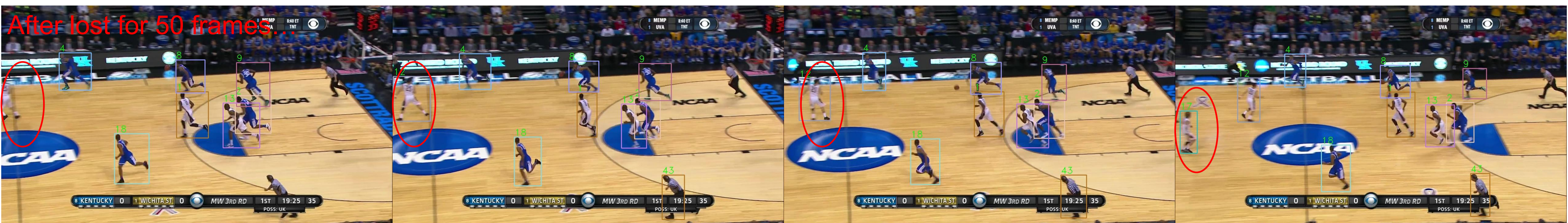
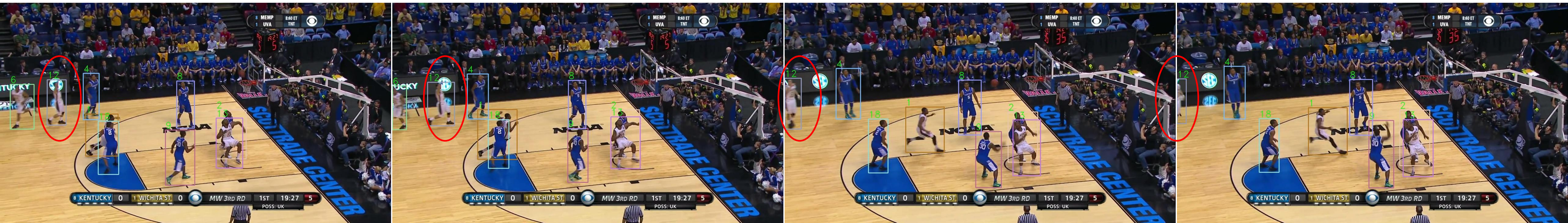
2. we introduce the ‘crowded target’ .if it is a crowded target, we allow one-to-many correspondence between crowded tracking objects and detection objects, while non-crowded tracking objects, similar to other trackers, only allow one-to-one correspondence.

Detections



Tracks

3. For the lost objects we classify them into two categories: lost in the center area of the image and lost at the edge of the image. For the lost objects at the edge of the image, we will compute the ReID distance with new objects from same orientation and determine whether they are same tracks.



4. To avoid generating incorrect new tracking targets, a detection target can only be a new tracking target if satisfied: 1. high confidence 2. does not match any tracking target 3. IOU value with other matched detection targets less than a specific threshold.

Final results

Method	Dataset	HOTA	AssA	DetA	MOTA
SportsTrack	Val	80.863	80.466	81.294	91.207
SportsTrack	Test	76.264	73.538	79.180	89.316

Test Set of SportsMOT (Ranked by HOTA)											
#	User	Entries	Date of Last Entry	Team Name	HOTA ▲	AssA ▲	DetA ▲	MOTA ▲	IDF1 ▲	IDs ▲	Frag ▲
1	BOE_AIoT_CTO	8	08/29/22	BOE_AIoT_CTO	76.264 (1)	73.538 (1)	79.180 (6)	89.316 (8)	84.453 (1)	2567.0 (1)	6104.0 (5)
2	PingPingPangPangBangBangBang	16	08/31/22	IPIU	74.899 (2)	64.592 (2)	86.968 (2)	95.590 (2)	78.342 (2)	4853.0 (6)	4536.0 (4)
3	hsiangwei0903	10	08/31/22	UWIPL_ETRI	73.968 (3)	63.460 (3)	86.316 (3)	94.832 (3)	78.271 (3)	2754.0 (2)	3592.0 (1)
4	OverWhelmingFlt	8	08/31/22	AI PRIME	73.225 (4)	60.855 (4)	88.205 (1)	96.018 (1)	73.963 (5)	3405.0 (5)	4123.0 (3)
5	MiaoMiao	8	08/22/22		71.489 (5)	59.548 (6)	85.945 (4)	93.632 (6)	73.892 (6)	11271.0 (9)	11949.0 (9)

Thanks for watching!