

Real Time Identification in Crowds

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Predator[1]



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Why the TLD approach?



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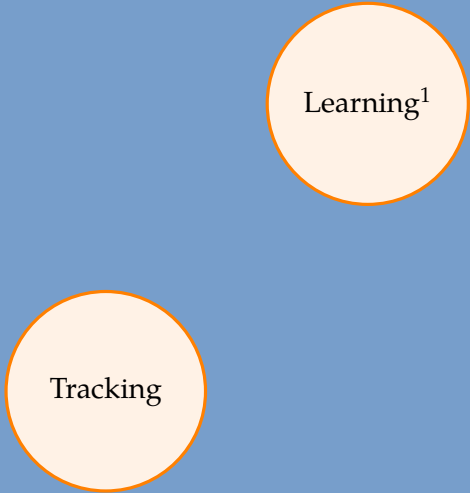
- ✦ Fast and Lightweight
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- ✦ Synergy with recognition
- ✦ Generic

TLD Approach[2]



Tracking

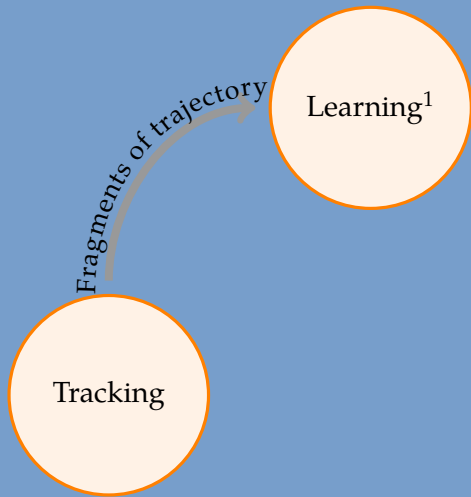
TLD Approach[2]



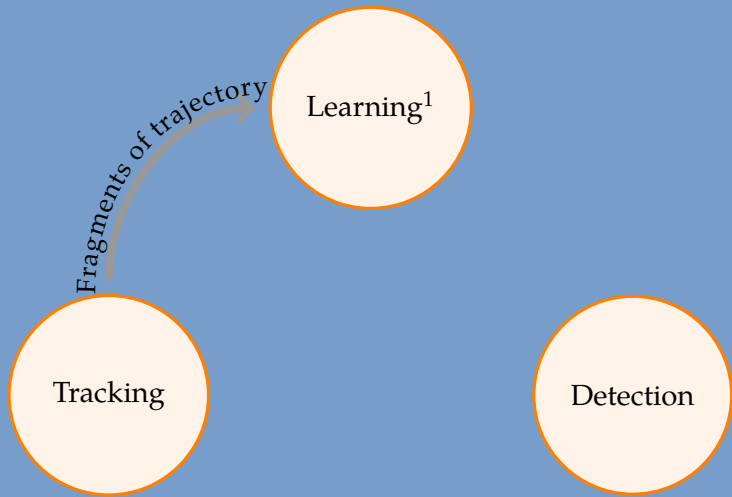
Learning¹

Tracking

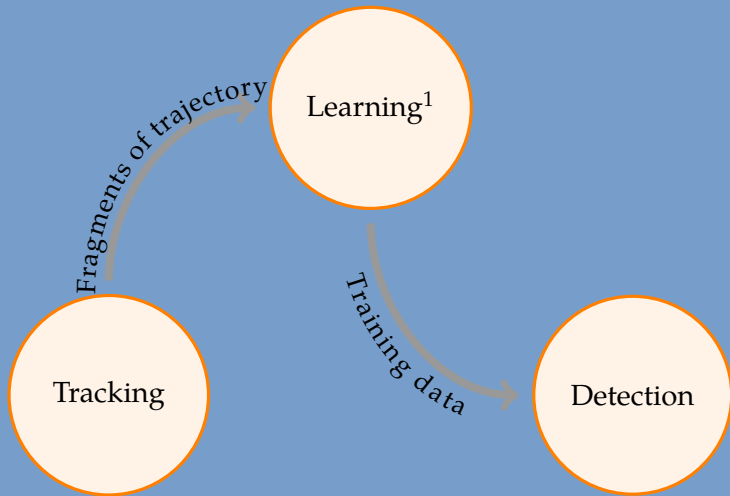
TLD Approach[2]



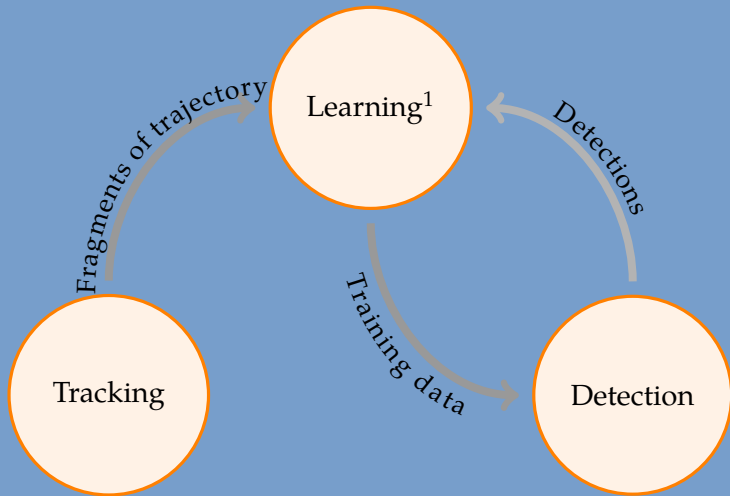
TLD Approach[2]



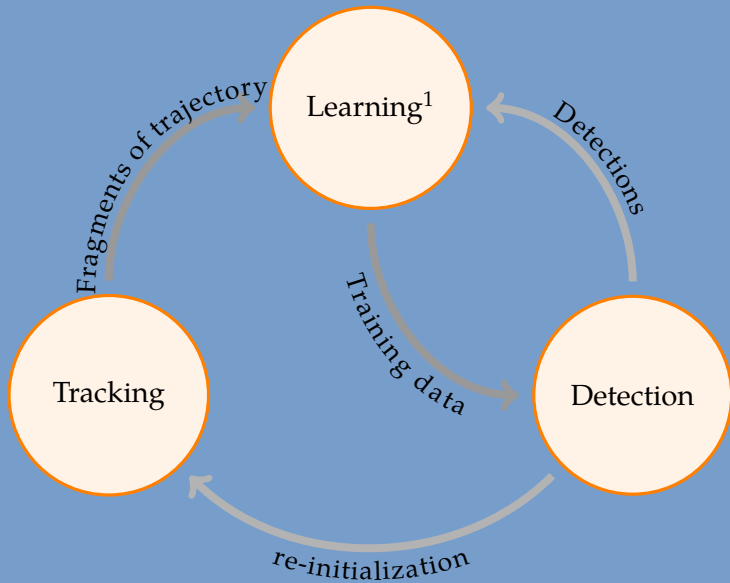
TLD Approach[2]



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Improvements to Predator



Improvements to Predator

- ✦ Relatively bad tracking algorithm



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- ✦ Kernelized Correlation Filters [3]
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Algorithm	feature	Mean precision	Mean FPS
KCF	HOG ²	73.2%	172
KCF	Raw pixels	56.0%	154
TLD		60.8%	28



²Histogram of Oriented Gradients

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✚ Better Learning Models?

✚ Better Detection Models?

²Histogram of Oriented Gradients

Goal



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✚ Create a system

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- ✚ Create a system that takes a live video feed

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- ✚ Create a system that takes a live video feed of a crowd of people

Goal

- ✦ Create a system that takes a live video feed of a crowd of people and identifies and tracks people in the video.



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◇ ETHICS!

◇ Time.



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 - ◇ Time.
- ✦ Solutions?
 - ◇ Public Data. For now...
 - ◇ Work harder.

Further applications

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Class
Register?

Further applications


A red, cloud-like shape with a double outline, containing the text "Class Register?".

Class
Register?


A blue, cloud-like shape with a double outline, containing the text "Assitive technologies?".

Assitive
technologies?


Further applications



Class
Register?




Assitive
technologies?




Airport
security?


Further applications




Class
Register?



Monotoring
animals?




Assitive
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Airport
security?

Further applications



Class
Register?

...?

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Assitive
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- ✚ Full Implementation of Predator
 - ◇ 3rd week of 2nd term

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 - ◇ 2nd week of 2nd Semester
- ✦ Extension to Multiple Object Tracking
 - ◇ Beginning of 4th Term

References

- [1] Z. Kalal, “Predator - tracker that learns and improves,” Youtube. (2011), [Online]. Available: <https://www.youtube.com/watch?v=1GhNXHCQGSM>.
- [2] Z. Kalal, K. Mikolajczyk, and J. Matas, “Tracking-learning-detection,” *IEEE transactions on pattern analysis and machine intelligence*, vol. 34, pp. 1409–1422, 7 2011.
- [3] J. F. Henriques, R. Caseiro, P. Martins, and J. Batista, “High-speed tracking with kernelized correlation filters,” *IEEE transactions on pattern analysis and machine intelligence*, vol. 37, pp. 583–596, 3 2014.