

People tracking in indoor environments

The research in the current context is focusing on the development of smart systems alongside autonomous devices that can help people in their lives. Whether we are talking about autonomous vehicles, robots, surveillance or smart home environments, being able to track and recognize the same person through a sequence of images as well as distinguish between multiple individuals is an important component.

Considering these applications, the need for a people tracking and re-identification system is imperative. The problem of people tracking and re-identification consists in detecting people in images, differentiating between the detected individuals as well as re-identifying the same people in a succession of frames. A system that tackles this type of problem, besides the clear objective, should also be able to deal with problems like occlusions or appearance variation. The complex nature of the problem has multiple factors, such as people passing behind obstacles while moving, different people having similar styles in terms of clothing and hairstyle, or even people that may have different appearance seen from the front compared with the back appearance.

The main objective of this research is to develop a system for people tracking in indoor scenarios.

Specific research directions will involve:

- Exploring existing datasets for people tracking (MOT challenge [3])
- Exploring existing techniques, both traditional [1] and convolutional [2] methods
- Proposing a new system for people tracking
- Validating the proposed system on existing datasets
- Evaluate the system in a real-life environment using a robot

[1] S. Vasuhi et al., "Real time multiple human tracking using kalman filter," in 2015 3rd International Conference on Signal Processing, *Communication and Networking (ICSCN)*, pp. 1–6, 2015.

[2] P. Voigtlaender, "Siam r-cnn: Visual tracking by re-detection," arXiv, pp. 6577–6587, 2020.

[3] L. Leal-Taixe et. al, Tracking the Trackers: An Analysis of the State of the Art in Multiple Object Tracking, *arXiv*, 2017.