With the growth of public camera recordings and video streams in recent years, there is an increasing need for automatic processing with limited human input. An important part of the process is detecting moving objects in the video and grouping individual detections across video frames into trajectories. This thesis presents a set of algorithms for creating trajectories from object detections while using a configurable analytic model. Presented algorithms are based on the clustering of detections, later even simple trajectories, into complex trajectories by their features, such as a timestamp (frame), bounding rectangle in the video frame and optionally, image crop defined by the bounding rectangle. To present the usage of the generated trajectories, we then introduce methods for further analysis and data extraction. The first method improves the input detections by adding missing detection due to the detector error. The second one is creating a simple semantic description of trajectories to enable further research, such as action analysis or trajectory searching.