**Contributions:**
- Propose an algorithm to combine object appearance and motion cues to solve the association problem on the MOT(S).
- An online one-stage point-based tracker
- Outperform the state-of-the-art 2D online methods
- Investigate the synergy between tracking and segmentation
  - Tracking can benefit from the dense pixel-wise annotations in our experiments.
  - Networks can learn better separation of foreground and background in the scene.
- Evaluation on two real-world datasets
  - KITTI MOTS
  - MOT17

**Observation:**
- The tracked object in MOT(S) is highly correlated across consecutive frames, tracing its trajectory is helpful for tracking.
- We encode the object motion predicted by the Kalman filter with the object appearance feature to produce a motion-aware feature.
- We propose the object-customized dynamic searcher to identify the association for a given object.

**Network Architecture:**

**Ablation study on motion-aware feature:**

**Ablation study on segmentation branch:**

Source code: [https://github.com/qa276390/SearchTrack](https://github.com/qa276390/SearchTrack)