

Supplementary Material to “Double-Weighted Low-Rank Matrix Recovery Based on Rank Estimation”

In this document, we present more real data results which are not included in the main paper due to the page limit.

1. More Results

We used more datasets from SBI database to further validate our low-rank matrix recovery algorithm. We used HighwayI, Candela M1.10, and Board. HighwayI dataset has 439 frames with a resolution of 320×240 , which describes the scenario that the car is fast driving along the highway. Board dataset consists of 227 frames with a resolution of 200×164 . People in the Board dataset move in the same area for most frames. The Candela_M1.10 dataset consists of 350 frames with a resolution of 352×288 , where the man enters the room and places a bag then walks out. For the majority of the frames, the man sits on the couch and does not move. In the experiment, we selected the 5th, 78th, 156th, 229th, 302th, and 375th frames in HighwayI dataset. 5th, 43th, 81th, 119th, 157th, and 195th frames in the Board dataset were observed and compared. For the Candela_M1.10 dataset, 5th, 63th, 121th, 179th, 237th, and 295th frames are selected. We can see that our algorithm performs well on these challenging datasets.

In Fig.1 and Fig.2, because people in the dataset move in the same image region in many frames, it is very difficult to initialize the background through low-rank matrix recovery. Both RPCA and PSSV could not separate the person and the background. WNNM and Accaltproj had better effects than RPCA and PSSV, and there were also obvious figures. Although our algorithm fails to separate the background cleanly, the effect is superior to other algorithms. In Fig.3, the cars were moving quickly, the separated background by RPCA and PSSV still exists some image persistence. WNNM, Accaltproj, and our algorithm separated the background well.



Fig.1 Comparison of different algorithms with different frames on Board dataset

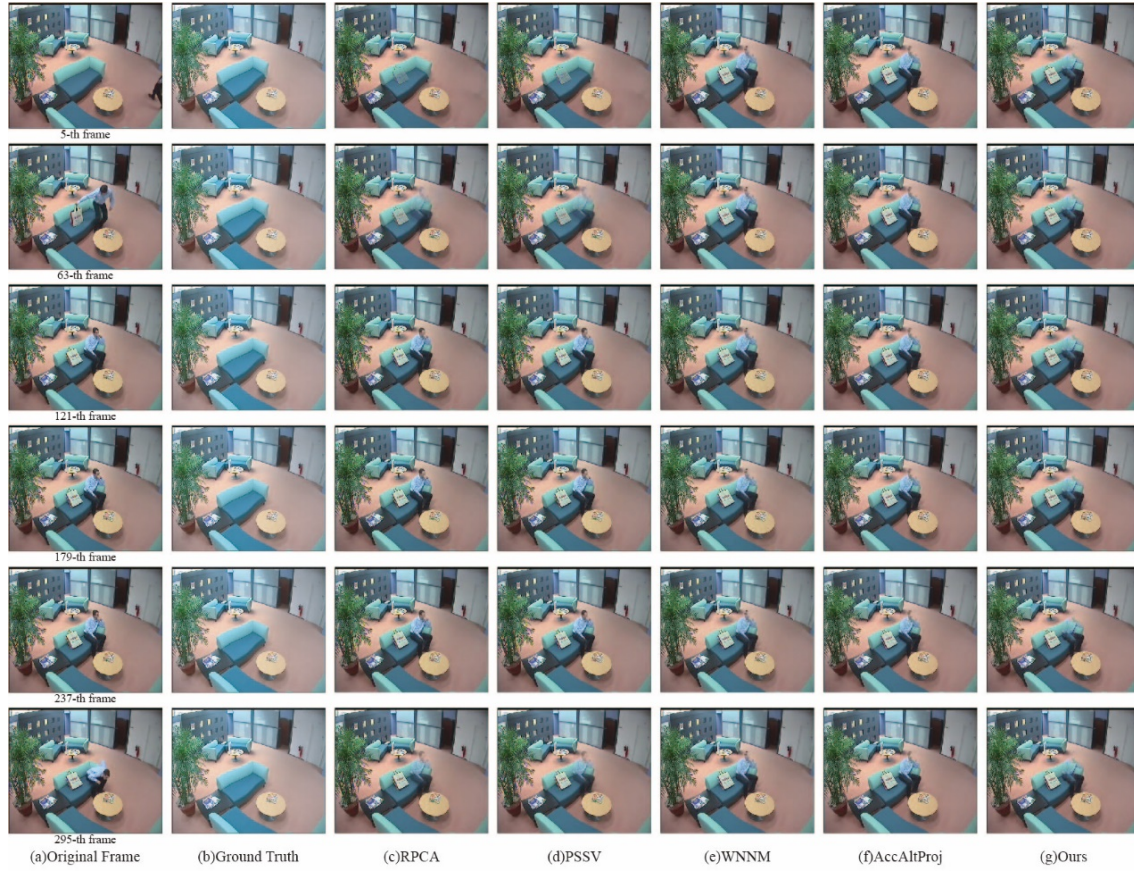


Fig.2 Comparison of different algorithms with different frames on Candela_M1.10 dataset

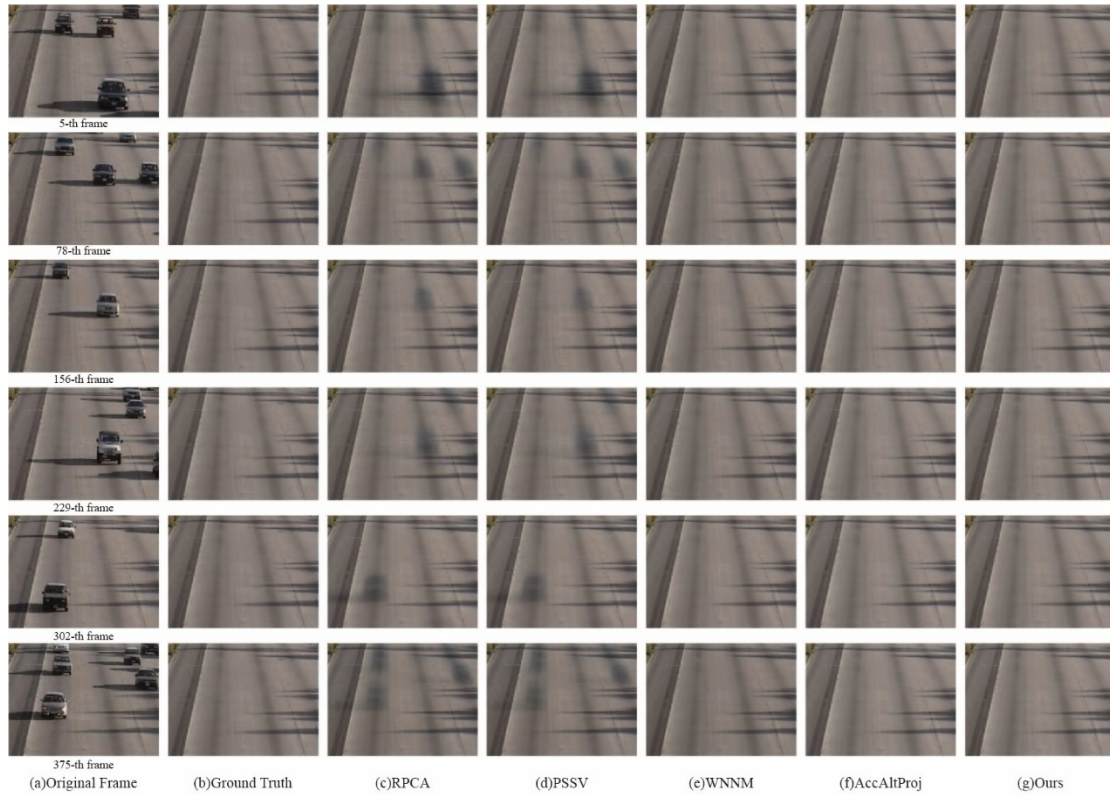


Fig.3 Comparison of different algorithms with different frames on HighwayI dataset

We present the decomposition result of all frame for all test algorithm. The demo videos can be found online:

<https://sites.google.com/view/papershow/%E9%A6%96%E9%A1%B5>