Supplemental Material

Anonymous WACV submission

Paper ID 130

1. Demonstration of convergence of Center of Trajectory

An example of COT convergence on a real sequence is shown in Fig. 1. A similar demonstration can be found in [1]

2. Exhaustive Restoration Results for all the videos in Table.1 of the paper

1. A folder 'Collage_MeanImages' containing collages of mean images of the videos restored by:
   (a) Fourier method (FM)
   (b) The two stage method of [2] (SBR)
   (c) The method based on learned water bases from [3] (LWB)
   (d) Fourier followed by SBR (FM + SBR)
   (e) Fourier followed by LWB (FM + LWB)

   Besides this, we have also included the ground truth image of all video sequences and the mean image of the distorted videos. *All seven images are displayed as a collage for easy comparison.* We also show separate collages containing local SSIM maps superimposed on the mean images. The local SSIM map consists of values of the form $1 - s(i)$ computed at the i^{th} pixel, where $s(i)$ is the local SSIM value. This map is displayed in red color and the bright regions show clearly where the distortion is high. Besides numerical values, *the local SSIM map also shows that the restoration quality improves when the videos are pre-processed using FM*.

2. A folder 'Restoration_Videos' containing videos restored by each of the methods. The videos are well annotated, and also contain the mean image with a local SSIM map superimposed. .

Both the above folders contain a README.txt file each.

3. Motion Reduction Results

The folder 'MotionReduction' contains few videos giving a clear idea of the level of motion reduction achieved by the Fourier step. The folder contains a README.txt file.

References

[1] J. G. James, P. Agrawal, and A. Rajwade. Restoration of non-rigidly distorted underwater images using a combination of compressive sensing and local polynomial image representations. In *ICCV*, 2019. 1

[2] O. Oreifej, G. Shu, T. Pace, and M. Shah. A two-stage reconstruction approach for seeing through water. In *CVPR*, pages 1153–1160, 2011. 1

[3] Y. Tian and S. Narasimhan. Seeing through water: Image restoration using model-based tracking. In *ICCV*, pages 2303–2310, 2009. 1

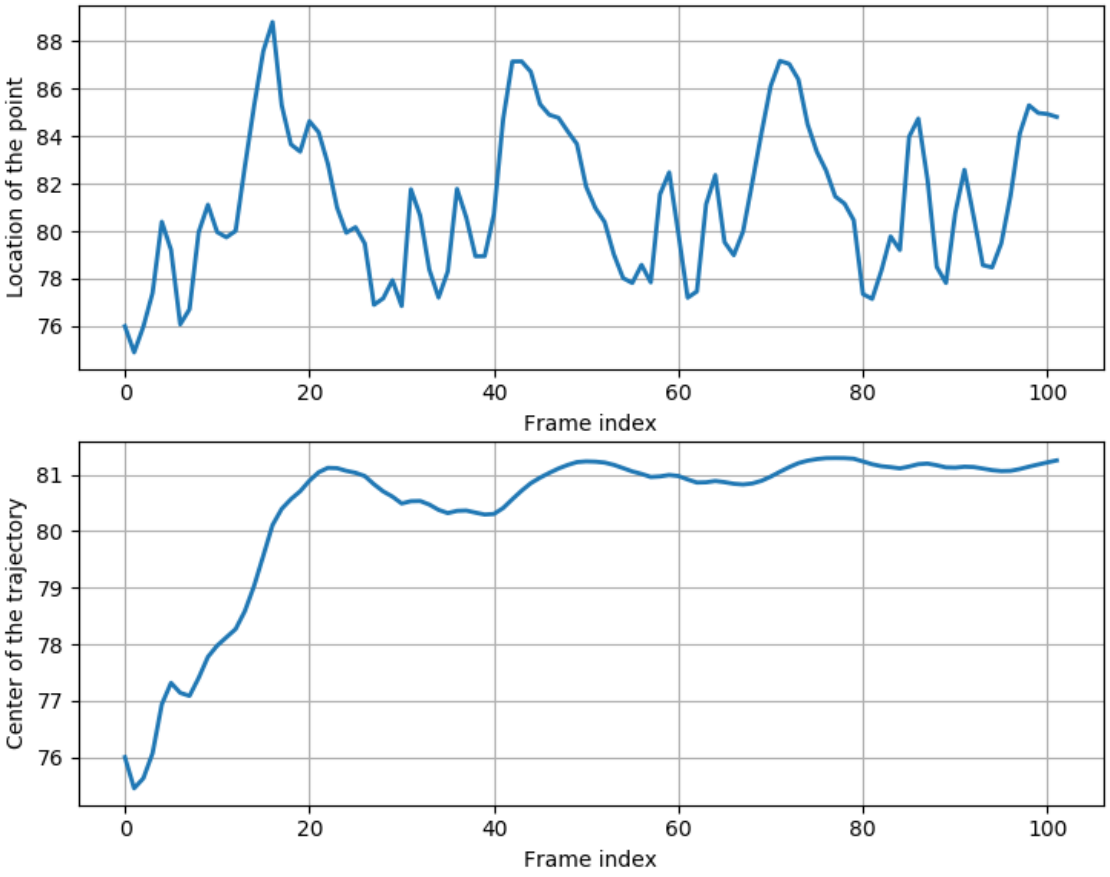

Figure 1. Convergence of COT (second from top) of a salient feature point trajectory (topmost) from a real video sequence