Personal Multimedia Enhancement & Management
Robust Video Super-resolution

Higher resolution video from low resolution video

- Combines information from multiple images to recover high-resolution detail
- Cleans up videos by removing camera noise and compression artifacts
- Benefits consumer electronics applications, i.e., enhancing low resolution videos
- Benefits professional video applications such as up-sampling to new video standards, video surveillance, etc.
- Computationally intensive: requires tera-scale computing performance for real-time conversion to high-definition

Input sequence   **Alignment**   **Robust Bayesian estimation**   **High-resolution image**

1) Precise alignment of low resolution video frames (pixel by pixel)

2) Calculate higher resolution image using robust statistical estimation of missing spatial information

Robust statistics protects against pixels wrongly aligned, and preserves edges in the high resolution image

4x enlargement, pixel replication

4x enlargement, bi-cubic interpolation

Original size 160 x 90 pixels video sequence

4x enlargement, super-resolution

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