Question 1: Image Extraction at Best Quality

Qn.1A, if you used the supplied replay software:
please save and submit your results using the filename:
'Q1A_ReplayDescribed_YOURINITIALS' or

Please specify (i) <u>the investigation method</u> used to <u>a) examine the video sequence</u> and <u>b) extract and examine the frame</u>, and (ii) <u>all steps executed</u>. The information you provide should have sufficient detail so that anyone could independently reproduce your results.

Qn.1A, if you used another method:
Please save and submit your results using the filename:
'Q1A_OtherMethod_YOURINITIALS' (Q1A_AFIVE_ID19)

Please specify (i) <u>the investigation method</u> used to <u>a) examine the video sequence</u> and <u>b) extract and examine the frame</u>, (ii) <u>all tools used</u>, and (iii) <u>all steps executed</u>. The information you provide should have sufficient detail so that anyone could independently reproduce your results.

1) We used undestructive conversion of "drv" video file
a. Opening and conversion video file in AMPED FIVE software (drag and drop)
b. Extracting of first video frame, analysing of frame characteristic
2) We used video loader (drag and drop), play, image writer (Jpeg), file info tool
3) Convert and open video, then define and extract frame from video. At the end we analysed the appropriate frame

Qn.1B, if you used the supplied replay software:
Please save and submit your results using the file name:
'Q1B_ReplayDescribed_YOURINITIALS' ('Q1B_DM_ID19)

Please specify (i) <u>the investigation method</u> used to <u>a) examine the video sequence</u> and <u>b) extract and examine the frame</u>, and (ii) <u>all steps executed</u>. The information you provide should have sufficient detail so that anyone could independently reproduce your results.

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    1) We used DM-observer player
     a. Opening of video file (par) in DM-Observer software (file-open video)
     b. Searching and extracting of define video frame in Jpeg format,
    2) We used video loader (file-open video), play, save,
    3) Opening video, then define and extract frame from video. At the end we
       analysed the appropriate frame in AMPED FIVE.

Qn.1B, if you used another method:
Please save and submit your results using the filename:
'Q1A_OtherMethod_YOURINITIALS'

Please specify (i) <u>the investigation method</u> used to <u>a) examine the video sequence</u> and <u>b) extract and examine the frame</u>, (ii) <u>all tools used</u>, and (iii) <u>all steps executed</u>. The information you provide should have sufficient detail so that anyone could independently reproduce your results.

Qn.1C

Frame Size of source file recording used in Qn.1A				Frame Size of source file recording used in Qn.1B			
720	x	288	pixels	720	x	576	pixels

What are your conclusions about the raw, encoded quality of the provided video frame/sequence in Q1A and Q1B?

Q1A: Caputred still images in Q1A are streched (fields), the missing lines should be interpolated.
Q1B: For video Q1B, we had to find asked frame, therefore we used DM - Observer (for time data reading.

Question 2: Super-Resolution from supplied sequence of 249 .bmp files

Qn.2A

Please select your best result, i.e.: a single best quality super-resolution image:
Please save and submit your results using filename: "Q2A_SR_ID19"

1. How have you ingested the material into your enhancement system and super-resolution software tools?
   Please detail all steps of any conversion performed including all software tools and settings used. The information you provide should have sufficient detail so that anyone could independently reproduce your results.

   Material was ingested by video loader tool to AMPED FIVE. Software tools and settings are described in continuation. Details are described in next answer.

2. Please specify all software tools and all Enhancement Filters used (in order) and specific parameter settings; e.g. Super-Resolution Filter (Method? Zoom factor? Number of Iterations? Interpolation?......)

   1. Sequence loader (249 bmp files)
   2. Integration Super resolution (zoom 2, iterations 1)
   3. Smart resize (zoom factor 4, definition steps 3, strength 1)
   4. Image Writer (BMP)

3. Did you select a "region of interest" for directing the super-resolution tool? If so please specify co-ordinates of the region (if used) in the format given by the tool.

   Region of interest wasn't selected.

4. Did you select any specific frames or image? If so, please provide details of range of frames or specific frames you used.

   We didn't select any specific images.

5. Please provide any other information that would be needed so that others would be able to repeat and reproduce your work.

   Use any space you need

Qn.2B

Please select your best result, i.e.: a single best quality super-resolution image:
Please save and submit your results using filename: "Q2B_SuperRes_YOURINITIALS"

1. How have you ingested the material into your enhancement system and super-resolution software tools?
   Please detail all steps of any conversion performed including all software tools and settings used. The information you provide should have sufficient detail so that anyone could independently reproduce your results.

   Material ("dav" file) was imported to AMPED FIVE by Video loader tool (drag and drop). Software tools and settings are described in continuation.

2. Which of the 5 number plates have you concentrated your efforts on (1=closest number plate, ..., 5=most distant) and how did you decide on selecting this number plate?

   Selected no. plate: 1, 2, 3, 4, 5

   Decision reached: First plate (1.) is the closest one, ... last (5.) is most distant

3. Please specify all software tools and all enhancement filters used (in order) and specific parameter settings; e.g. Super-Resolution Filter (Method? Zoom factor? Number of Iterations? Interpolation?......)

   1. Video loader tool
   2. Rotation tool 180 angle (bicubic),
   3. Crop tool (126,93,71,120),
   4. Resize (zoom factor 4, bicubic),
   5. Local stabilization filter (67,46,180,367),
   6. Integration (frame averaging tool),
   7. Optical debluring tool (size 7, noise 0,0031),
   8. Laplacian sharpening filter (strengh 0.2300),
   9. Image writer (format Jpeg).

   1.PRX 6ZIN
   2.A4V SDEN (50EH)
   3.WDCL/2B3
   4.KB97 UTP (UTF)
   5. DUM 1SGJ (156J)

4. Did you select a "region of interest" for directing the super-resolution tool? If so please specify co-ordinates of the region (if used) in the format given by the tool.

Crop tool was used (126,93,71,120).

5. Did you select any specific frames or image? If so, please provide details of range of frames or specific frames you used.

We didn't select specific images.

6. Please provide any other information that would be needed so that others would be able to repeat and reproduce your work.

Instead of Super resolution we used frame averaging filter

Qn2B. (continued): optional:

As indicated on the Collaborative Exercise webpage you may choose to submit multiple results. If this is the case then please specify how you obtained your results by replicating the previous 6 points for each Procedure/toolset used and/or each possible license plate you focussed on.

For example:

Please save and submit your results using filename:
'Q2B_SuperRes_Procedure1_PlateAll_YOURINITIALS' to indicate the best enhancement result you obtained for all plates using the Procedure1 you will describe using a cut-paste repetition of the 6 previous subquestions above, etc.

and/or

Please save and submit your results using filename:
File name: 'Q2B_SuperRes_Procedure2_Plate1_YOURINITIALS' to indicate the best enhancement result you obtained for Plate 1 using the Procedure2 you will describe using a cut-paste repetition of the 6 previous subquestions above, etc.

and/or

Please save and submit your results using filename:
File name: 'Q2B_SuperRes_Procedure2_Plate2_YOURINITIALS' to indicate the best enhancement result you obtained for Plate 2 using the Procedure2 you will describe using a cut-paste repetition of the 6 previous subquestions above, etc.

etc.

Qn.2C (optional)

Please select your best result, i.e.: a single best quality super-resolution image:
please save and submit your results using filename: "Q2C_SuperRes_YOURINITIALS"

1. How have you ingested the material into your enhancement system and super-resolution software tools?
   Please detail all steps of any conversion performed including all software tools and settings used. The information you provide should have sufficient detail so that anyone could independently reproduce your results.

   Use any space you need

2. Which of the 5 number plates have you concentrated your efforts on (1=closest number plate, ..., 5=most distant) and how did you decide on selecting this number plate?

   Selected no. plate: 1, 2, 3, 4, or 5

   Decision reached how:

3. Please specify all software tools and all enhancement filters used (in order) and specific parameter settings; e.g. Super-Resolution Filter (Method? Zoom factor? Number of Iterations? Interpolation?......)

   Use any space you need

   1.
   2.
   3.
   4.
   5.
   Etc

4. Did you select a "region of interest" for directing the super-resolution tool? If so please specify co-ordinates of the region (if used) in the format given by the tool.

5. Did you select any specific frames or image? If so, please provide details of range of frames or specific frames you used.

6. Please provide any other information that would be needed so that others would be able to repeat and reproduce your work.

Qn2C. (continued): optional:

As indicated on the Collaborative Exercise webpage you may choose to submit multiple results. If this is the case then please specify how you obtained your results by replicating the previous 6 points for each Procedure/toolset used and/or each possible license plate you focussed on.

For example:

Please save and submit your results using filename:
'Q2C_SuperRes_Procedure1_PlateAll_YOURINITIALS' to indicate the best enhancement result you obtained for all plates using the Procedure1 you will describe using a cut-paste repetition of the 6 previous subquestions above, etc.

and/or

Please save and submit your results using filename:
File name: 'Q2C_SuperRes_Procedure2_Plate1_YOURINITIALS' to indicate the best enhancement result you obtained for Plate 1 using the Procedure2 you will describe using a cut-paste repetition of the 6 previous subquestions above, etc.

and/or

Please save and submit your results using filename:
File name: 'Q2C_SuperRes_Procedure2_Plate2_YOURINITIALS' to indicate the best enhancement result you obtained for Plate 2 using the Procedure2 you will describe using a cut-paste repetition of the 6 previous subquestions above, etc.

etc.

Question 3: Focal deblur test

Please specify (i) <u>all software tools or processing steps</u>, (ii) <u>all enhancement filters</u> used (in order) and (iii) <u>all specific parameter settings.</u> The information you provide should have sufficient detail so that anyone could independently reproduce your results.

125 cm chart:
Please save and submit your results using filename: 'Q3_125cm_YOURINITIALS' or 'Q3_125cm_LineNUMBER_YOURINITIALS'

We used AMPED FIVE software

1. Image loader tool for opening image
2. Crop tool (selection 899,144,1002,1541),
3. Deblurring - motion deblurring filter (size 21, angle, 53, noise 0,0037, thickness 21),
4. Contrast stretch (intensity, sensibility 4),
5. Contrast brightness (contrast 41, brightness - 40)
6. Image writer (Jpeg format)

Results:
125 cm
1st line:KIVO
2nd line:PNOJ
3rd line:YXOF

75 cm, 4th line:
Please save and submit your results using filename: 'Q3_75cm_Line4_YOURINITIALS'

1. Image loader tool for opening image
2. Crop tool (selection 408,1078,635,138),
3. Deblurring - motion deblurring filter (size 14, angle, 65, noise 0,0017, thickness 10),
4. Resize (2x bicubic),
5. Contrast stretch (intensity 0),
6. Image writer (Jpeg format)

Results:
75 cm
4th line: EAHS or (UAHS)

75 cm, 5th line:

Please save and submit your results using filename: Q3_75cm_Line5_YOURINITIALS'

any other results: optional:

Please save and submit your results using filenames: 'Q3_DISTANCEcm_LineNUMBER_YOURINITIALS'

Question 4: Motion deblur test

Qn.4A:

Please specify (i) <u>all software tools or processing steps</u>, (ii) <u>all enhancement filters</u> used (in order) and (iii) <u>all specific parameter settings.</u> The information you provide should have sufficient detail so that anyone could independently reproduce your results.
If you wish to provide results for different regions of interest in the image, please specify their coordinates and/or indicate the region in a small thumbnail, and use the filenames: "Q4A_RegionNUMBER_YOURINITIALS".

Region NUMBER: coordinates and/or thumbnail:

Use any space you need, repeat section depending on number of regions (max. 5)

We enhanced four logos/texts by using AMPED FIVE software

Processing steps for the first image:
- image loader,
- crop x:1112,y: 619, w:204, h:157
- deblurring filter (motion deblurring): size 30, angle 5, noise 0.0023, thickness 1
- denoise (averaging filter): size 3
- save snapshot

Processing steps for the second image:
- image loader,
- crop x:112,y: 821, w:180, h:109
- deblurring filter (motion deblurring): size 34, angle 5, noise 0.0066, thickness 1
- denoise (averaging filter): size 3
- save snapshot

Processing steps for the third image:
- image loader,
- crop x:398,y: 1472, w:435, h:126
- deblurring filter (motion deblurring): size 33, angle 7, noise 0.0029, thickness 1
- save snapshot

Processing steps for the fourth image:
- image loader,
- crop x:1679,y: 1419, w:284, h:148
- deblurring filter (motion deblurring): size 33, angle 180, noise 0.0084, thickness 1
- adjust (levels:) highlights 205, midtones 102, shadows 0
- edit (resize): 2x bicubic
- save snapshot

Qn.4B:

Please specify (i) <u>all software tools or processing steps</u>, (ii) <u>all enhancement filters</u> used (in order) and (iii) <u>all specific parameter settings.</u> The information you provide should have sufficient detail so that anyone could independently reproduce your results.
If you wish to provide results for different regions of interest in the image, please specify their coordinates and/or indicate the region in a small thumbnail, and use the filenames: "Q4A_RegionNUMBER_YOURINITIALS".

Region NUMBER: coordinates and/or thumbnail:

We tried using Nonlinear deblurring filter, but in this case whitout any effective results.