

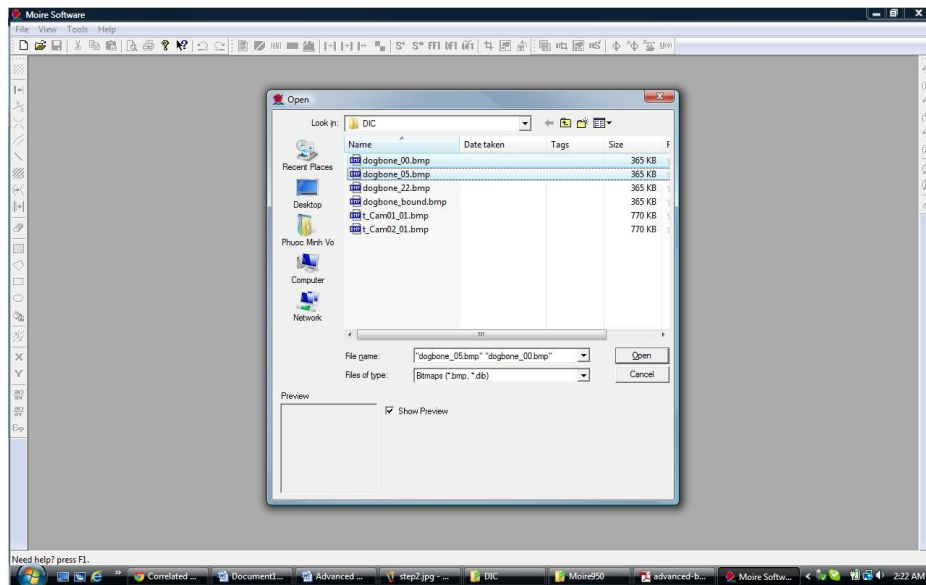
# Short Manual of the Advanced Digital Image Correlation Function in the MOIRE Software Package

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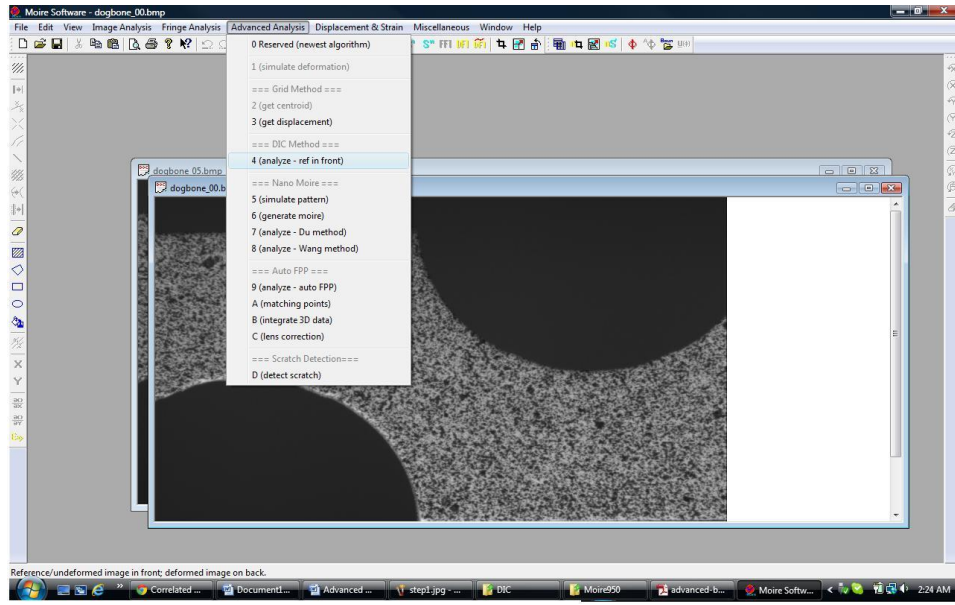
Date: Jan 07, 2012

A brief operation procedure of the 2D DIC function is as follows:

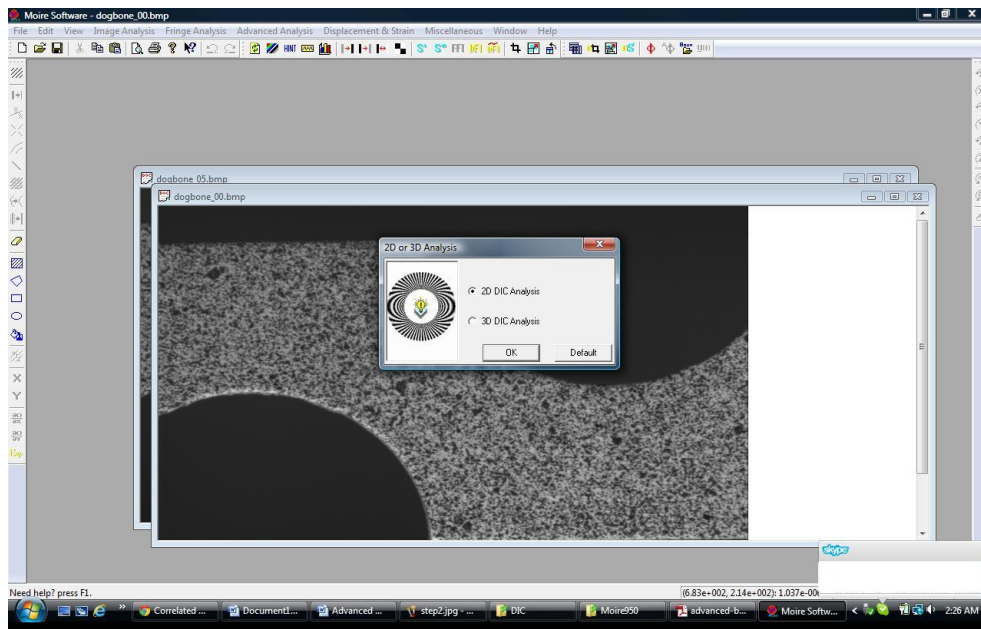
Step 1: Open the reference and deformed images with the reference image in front



Step 2: Click on the Advanced Analysis tab and choose analysis 4



Step 3: Choose 2D DIC Analysis in the next pop up dialog

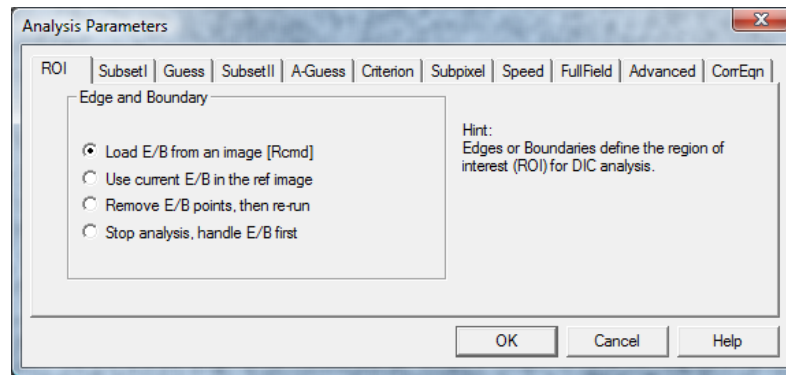


Step 4: In the next pop up dialog allows the users to adjust the DIC parameters. There is usually a short description for each option on the right side of the window.

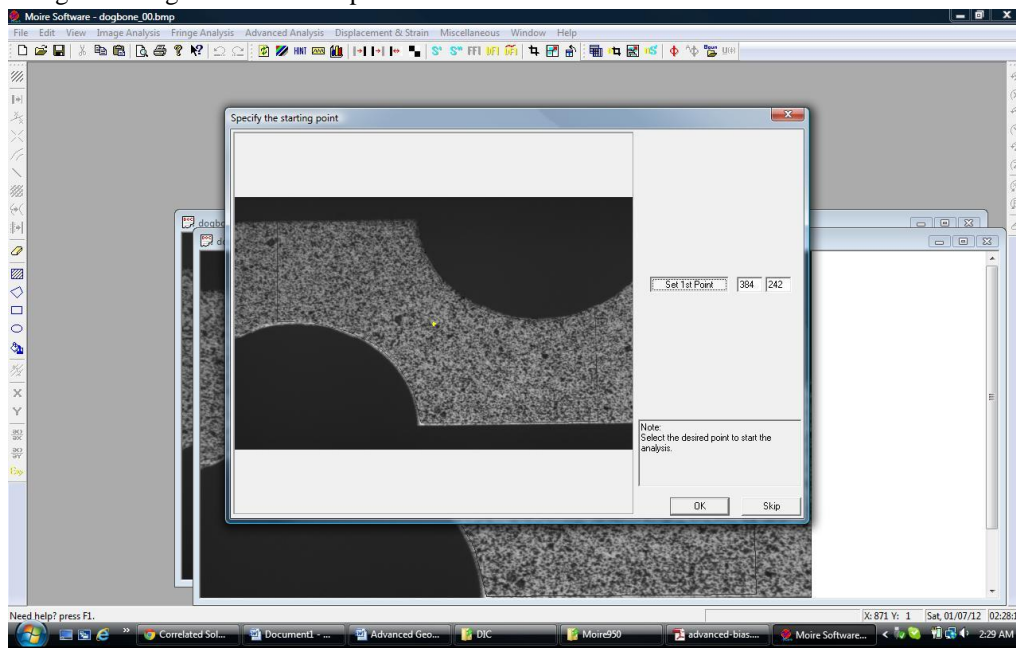
- ROI: define the region of interest. Two commonly used options are:
  - Load E/B from an image: a ROI image file must be pre-drawn
  - Use current E/B in the ref image: the user can draw the ROI directly on the reference image using the drawing tools on the left hand side of the window before running the DIC tools.
- Guess: when large deformation exists, it is advisory to manually choose the points of correspondence between the reference and deformed images. Automatic searching option should be sufficient in most cases.

- Subset II: enable the user to adjust the subset size and the distance between two subsets, i.e. calculation step.
- A-guess: adjustable parameters for automatic guess searching.

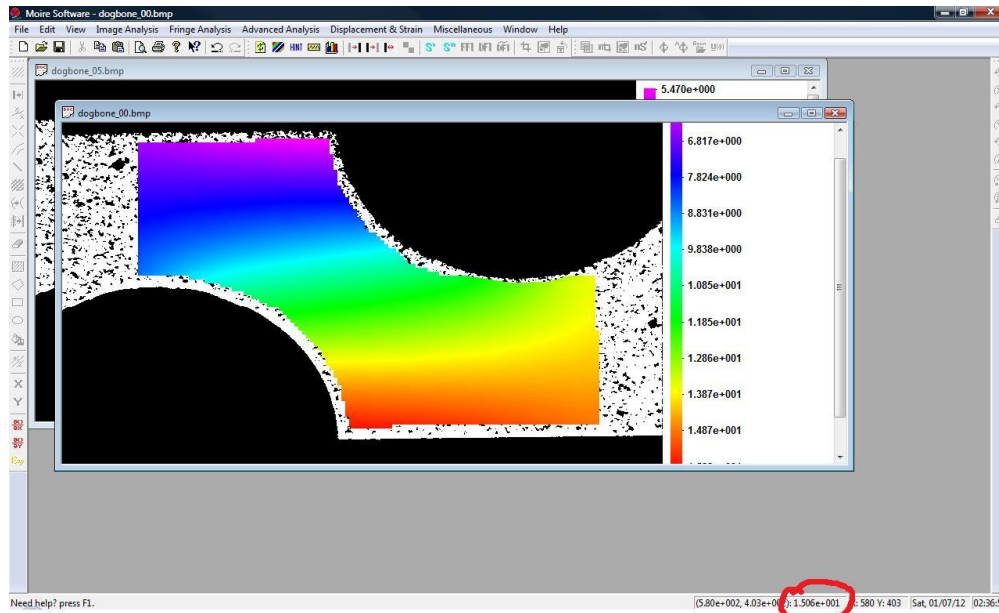
The other dialogs are mainly for our testing purposes. It is advisory to use the default parameters.



**Step 5:** Select the starting point. Although, it could be any point within the ROI, selecting a point in a good-contrast and well-distinguished region could be helpful.



**Step 6:** Display the results



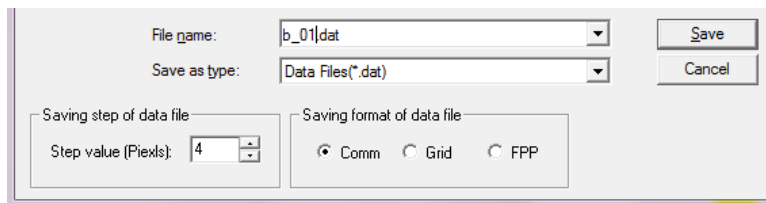
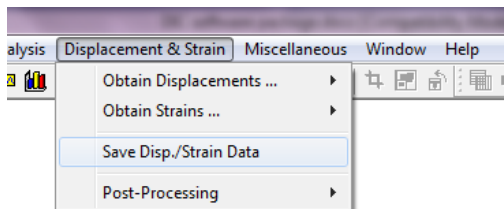
The displacements are given in pixels with the first image and the second one showing the displacements in horizontal direction and vertical direction respectively. This information for a point in the image is given when the cursor moves to that point.

#### Step 7: Strain calculation

If necessary, user can perform strain calculation.



#### Step 8: Save the results



#### References:

1. B. Pan, **Z. Wang**, and Z. Lu, "[Genuine full-field deformation measurement of an object with complex shape using reliability-guided digital image correlation](#)," *Optics Express*, Vol. 18, No. 2, 1011-1023, 2010.
2. B. Pan, H. Xie, and **Z. Wang**, "[Equivalence of digital image correlation criteria for pattern matching](#)," *Applied Optics*, Vol. 49, No. 28, pp. 5501-5509, 2010.
3. L. Luu, **Z. Wang**, M. Vo, T. Hoang, and J. Ma, "[Accuracy enhancement of digital image correlation with B-spline interpolation](#)," *Optics Letters*, Vol. 36, No. 16, pp. 3070-3072, 2011.