

Ncorr_post_CSTool – open-source Digital Image Correlation (DIC) post-processing tool to extract and display strains in a cross-section

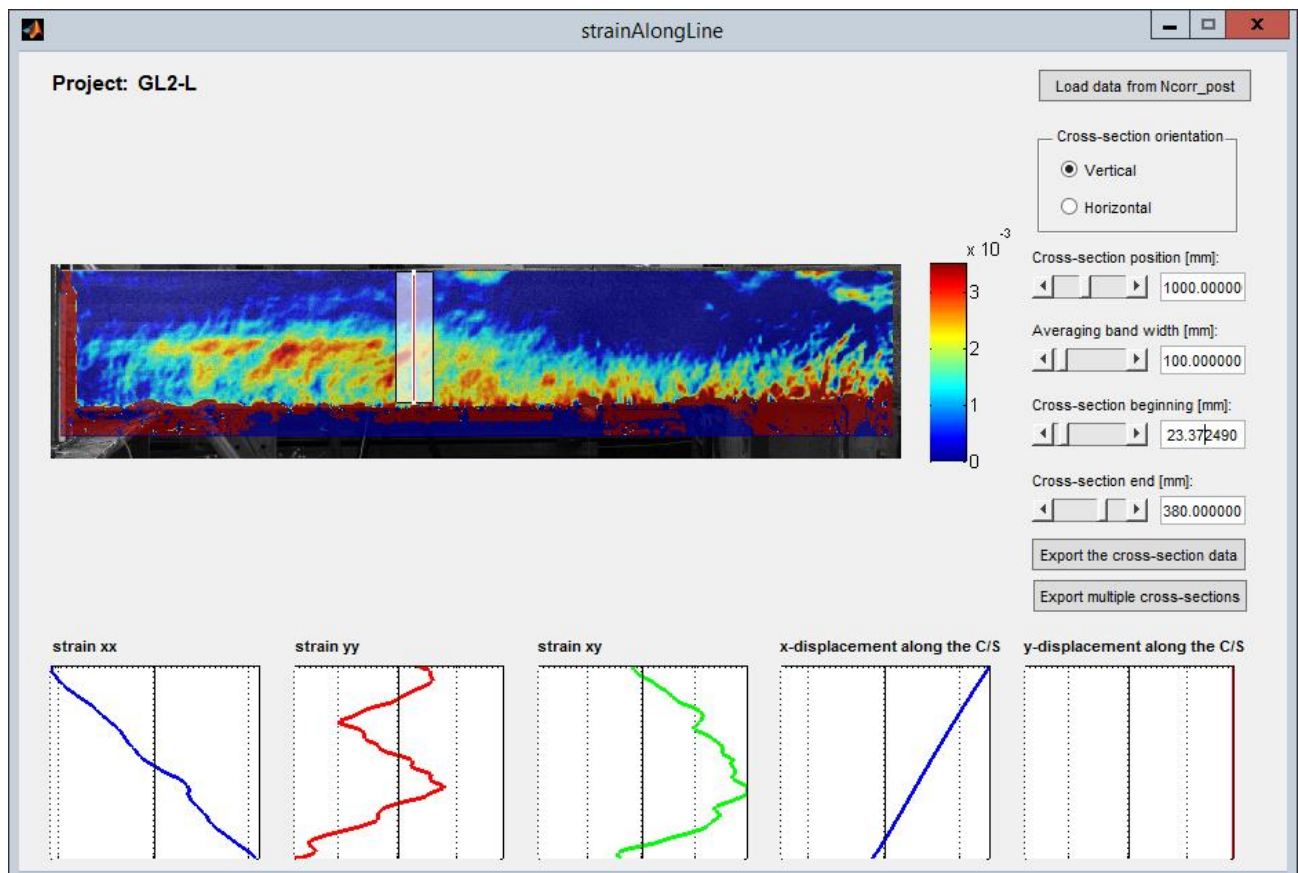
Instruction Manual

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Václav Nežerka

Department of Mechanics, FCE, CTU in Prague

vaclav.nezerka@fsv.cvut.cz



Introduction

Ncorr_post_CSTool is a post-processing application tailored for displaying strains along any vertical or horizontal cross-section. The program offers averaging of an arbitrary width and rich exporting capabilities: either a single cross-section of any number of cross-sections along a straight path. It is an extension to Ncorr_post processing Tool that has been developed to visualize and export of the data provided by [Ncorr DIC tool](#), which has been developed by Justin Blaber and Antonia Antoniou at the Georgia Institute of Technology. **The effort and guidance of the authors providing Ncorr DIC tool in the form of user-friendly open source software is gratefully acknowledged.** All programs, Ncorr, Ncorr_post and Ncorr_post_CSTool were developed and run in the [MATLAB environment](#). For an optimal performance it is recommended to use MATLAB R2011a or higher.

The DIC process and formatting of displacements and strains is thoroughly described in the [Ncorr Instruction Manual](#). Ncorr_post is also provided complemented with a thorough manual and therefore all the DIC applications are easily accessible by even non-experienced user.

1. Program Structure

The program initiates after running the strainAlongLine.m file, located in the root program folder (Figure 1). Exported data for individual cross-sections can be found in the “export”, while folder “files” stores the program auxiliary scripts and functions, and does not need to be accessed by the user.

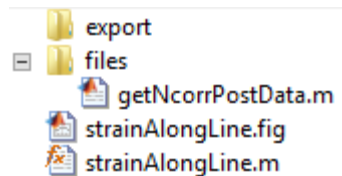


Figure 1: Structure of the program folders and files.

2. Data Acquisition

When initiating the program, data from DIC analysis can be loaded by pushing “Load data from Ncorr_post” button therefore the Ncorr_post window must be open (Figure 3).

The project name is retrieved, as well as all other data, from Ncorr_post. The program works only with the current image loaded from Ncorr_post, switching among images or adjustment of scaling is not available in Ncorr_post_CSTool. The project name is consequently used for saving the exported data. Note that the **displacements must be scaled in Ncorr_post prior to running the Ncorr_post_CSTool**, otherwise the program does not work.

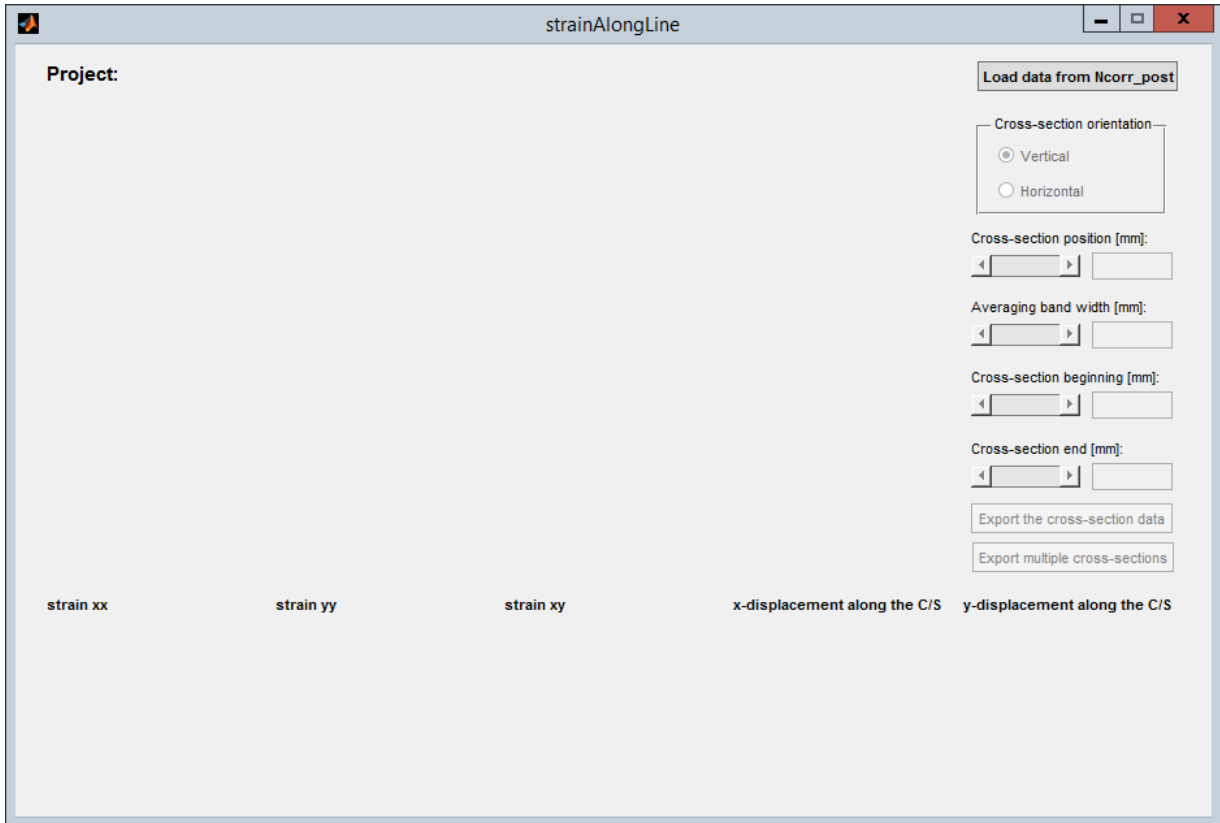


Figure 2: Initial GUI after opening Ncorr_post_CSTool.

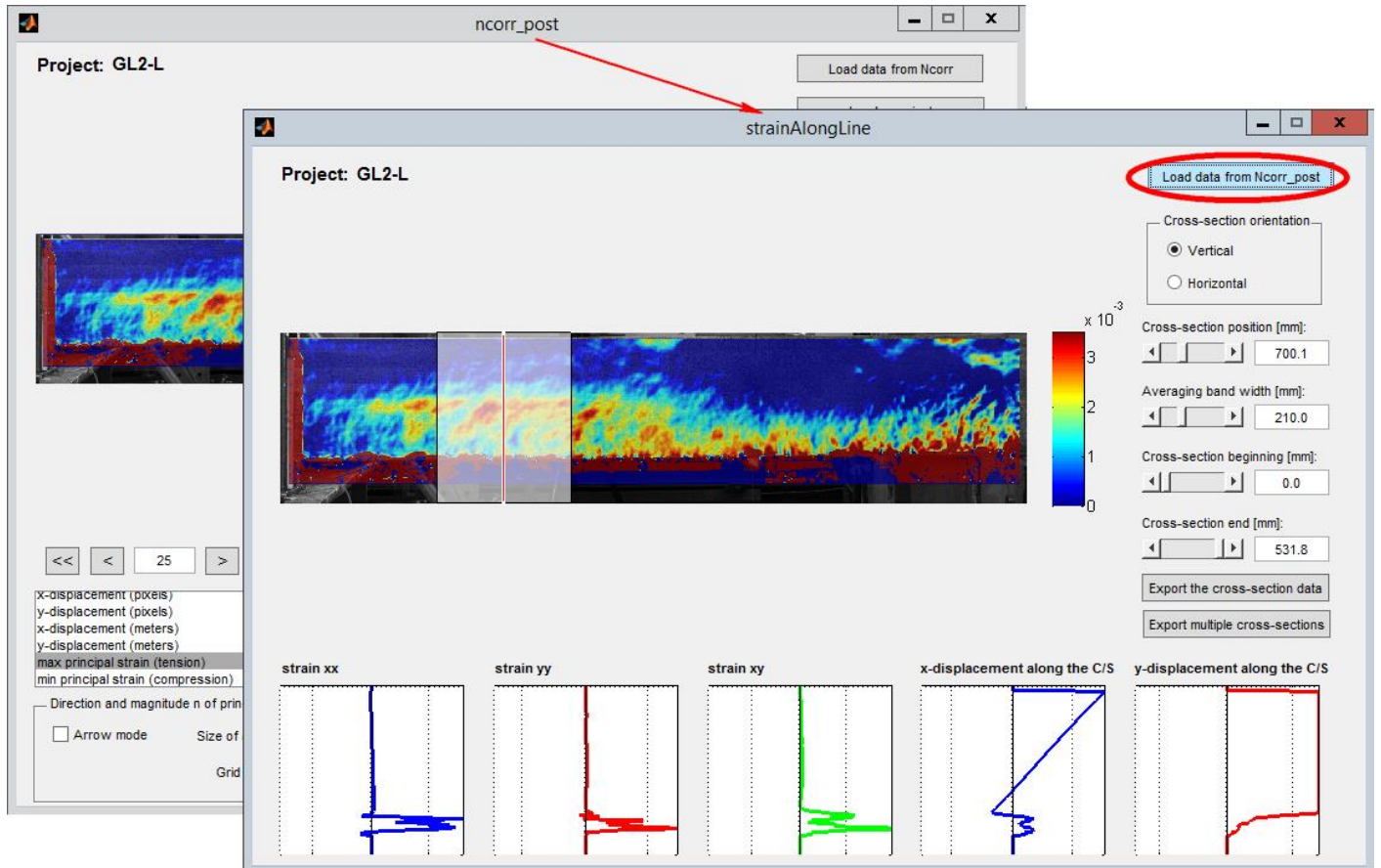


Figure 3: Data transfer between Ncorr_post and Ncorr_post_CSTool.

1. Adjustment of Graphics and Plotting Options

Setting of the cross-section is quite straight-forward. It is sufficient to read the labels on the right UI panel to identify the function of individual buttons, sliders, toggle buttons or edit boxes. The program is designed dynamically so that the user cannot input false information, e.g. averaging band width exceeding the size of the sample.

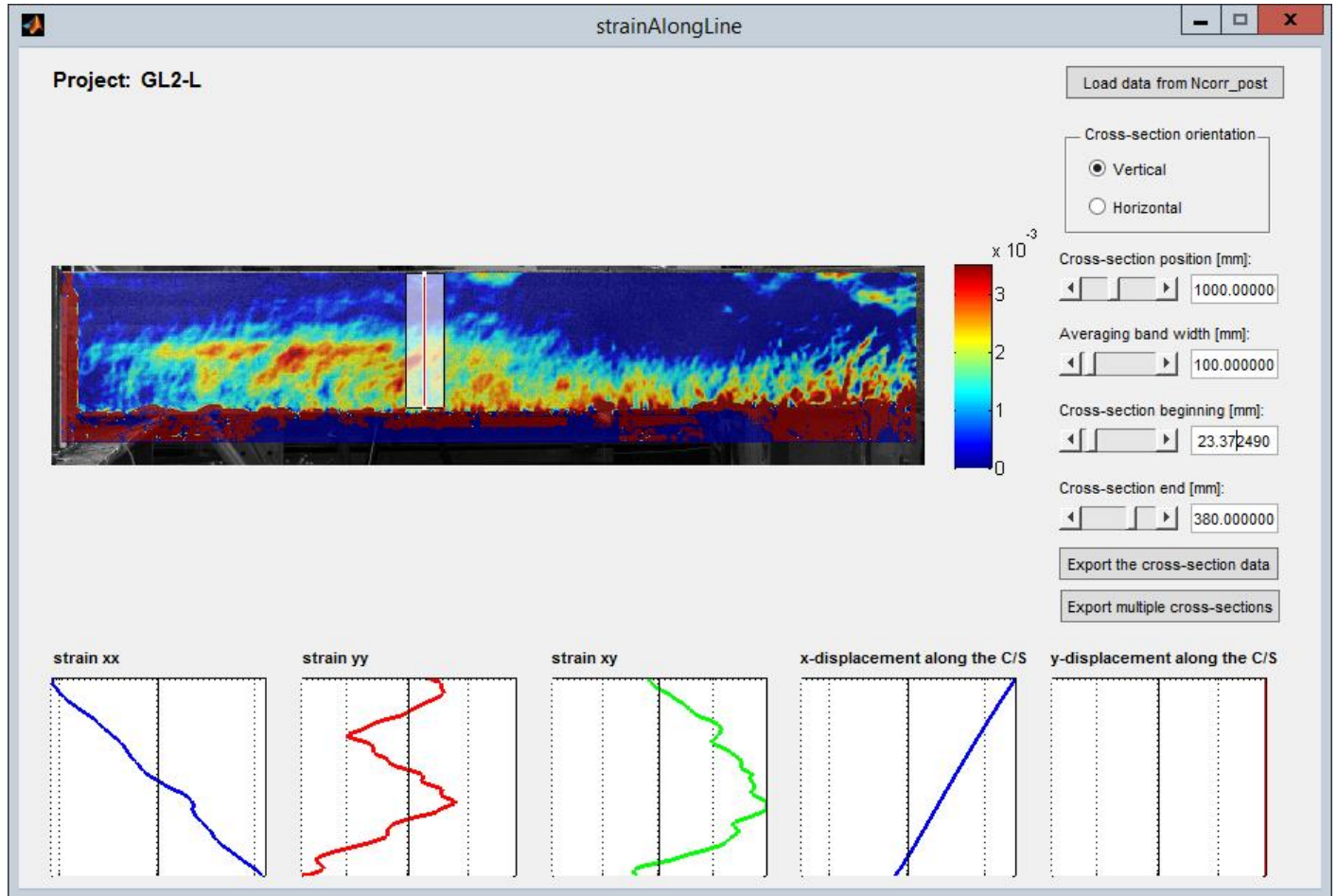


Figure 4: Adjustment of cross-section for plotting of strain distribution.

After the displacements are scaled, the virtual extensometer can be attached to the specimen and plotting of true displacements becomes available.

2. Saving the data

The data for the selected cross-section can be easily saved using "Export the cross-section data" and the *.txt file for further postprocessing (e.g. in Excel spreadsheet) is created using the project name and the name of the cross-section provided by the user (Figure 5).

Similar procedure is followed when exporting multiple cross-sections along a line (horizontal line for vertical cross-sections and vice versa). When selecting such option, the user is asked for the name of the cross-section group, starting position and spacing of the cross-sections to be saved. The averaging band width must be defined beforehand and is kept constant through all the saving process.

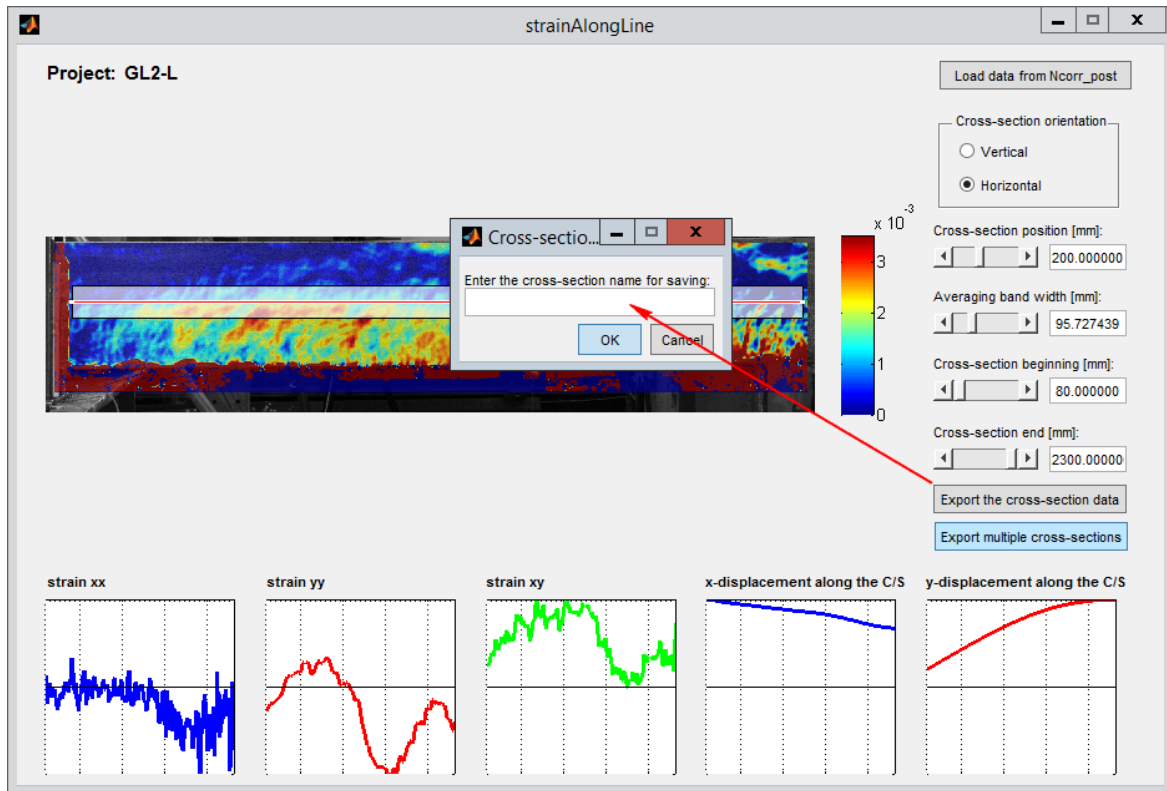


Figure 5: Pop-up dialog when saving a single cross-section data.

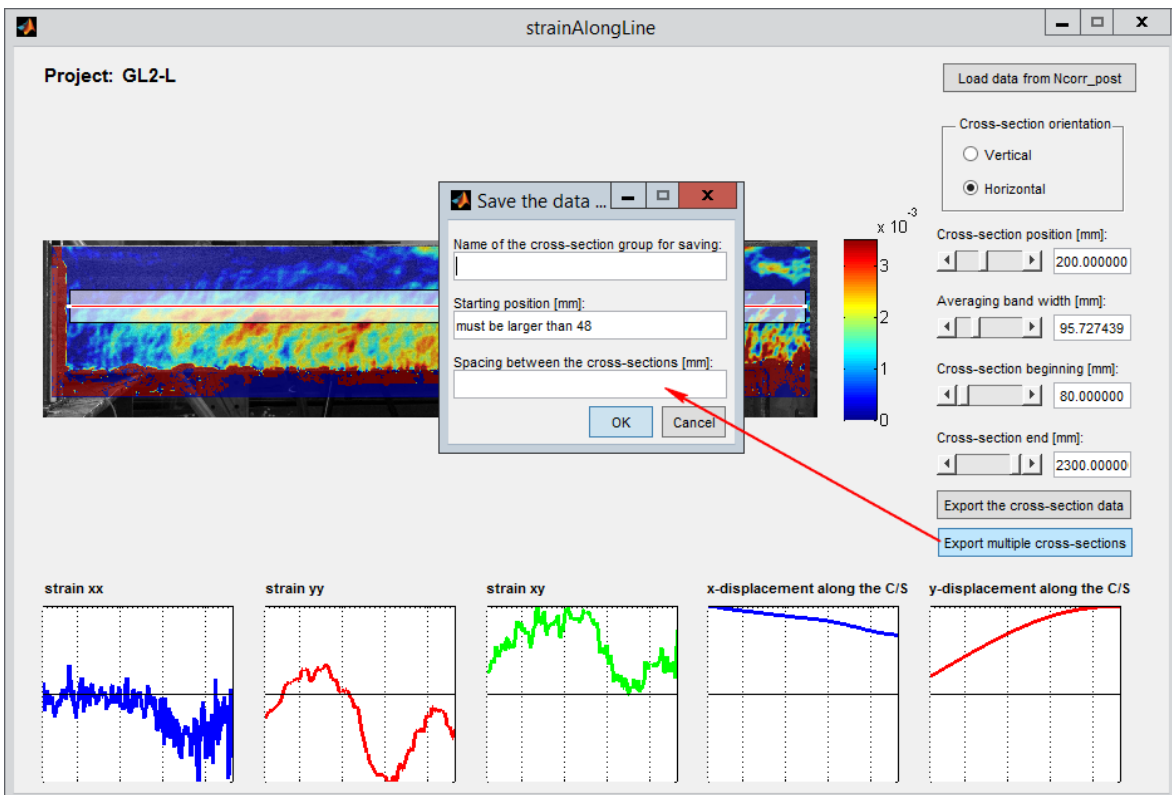


Figure 6: Pop-up dialog when saving the data from multiple cross-sections.

Acknowledgement

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