SAGUARO

OPEN-SOURCE DATA ANALYSIS AND VISUALIZATION SOFTWARE PLATFORM

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SAGUARO

NOT JUST A TYPE OF CACTUS ANYMORE

SAGUARO (Software Analysis Graphical-user-interface from University of Arizona for Research in Optics).

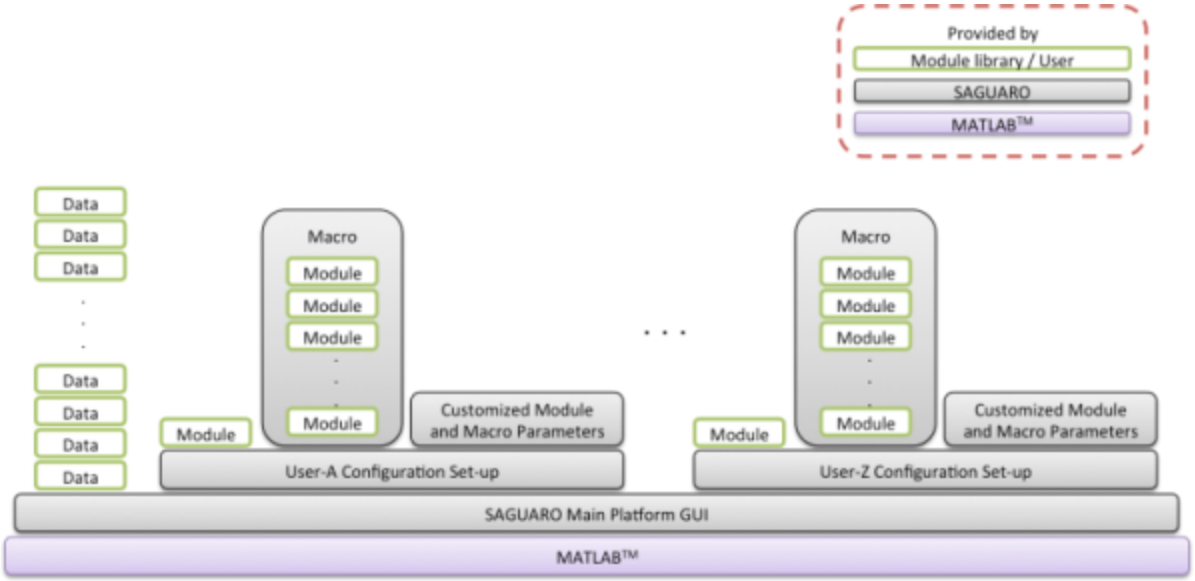
Free Share-ware data processing platform for optical engineering.

More than 400 downloads since the beta-release at the SPIE conference in Sept. 2011.

Dae Wook Kim, Benjamin Lewis, and James Burge, "Open-source data analysis and visualization software platform: SAGUARO," Optical Manufacturing and Testing IX, Proc. of SPIE Vol. 8126, 81260B (2011).

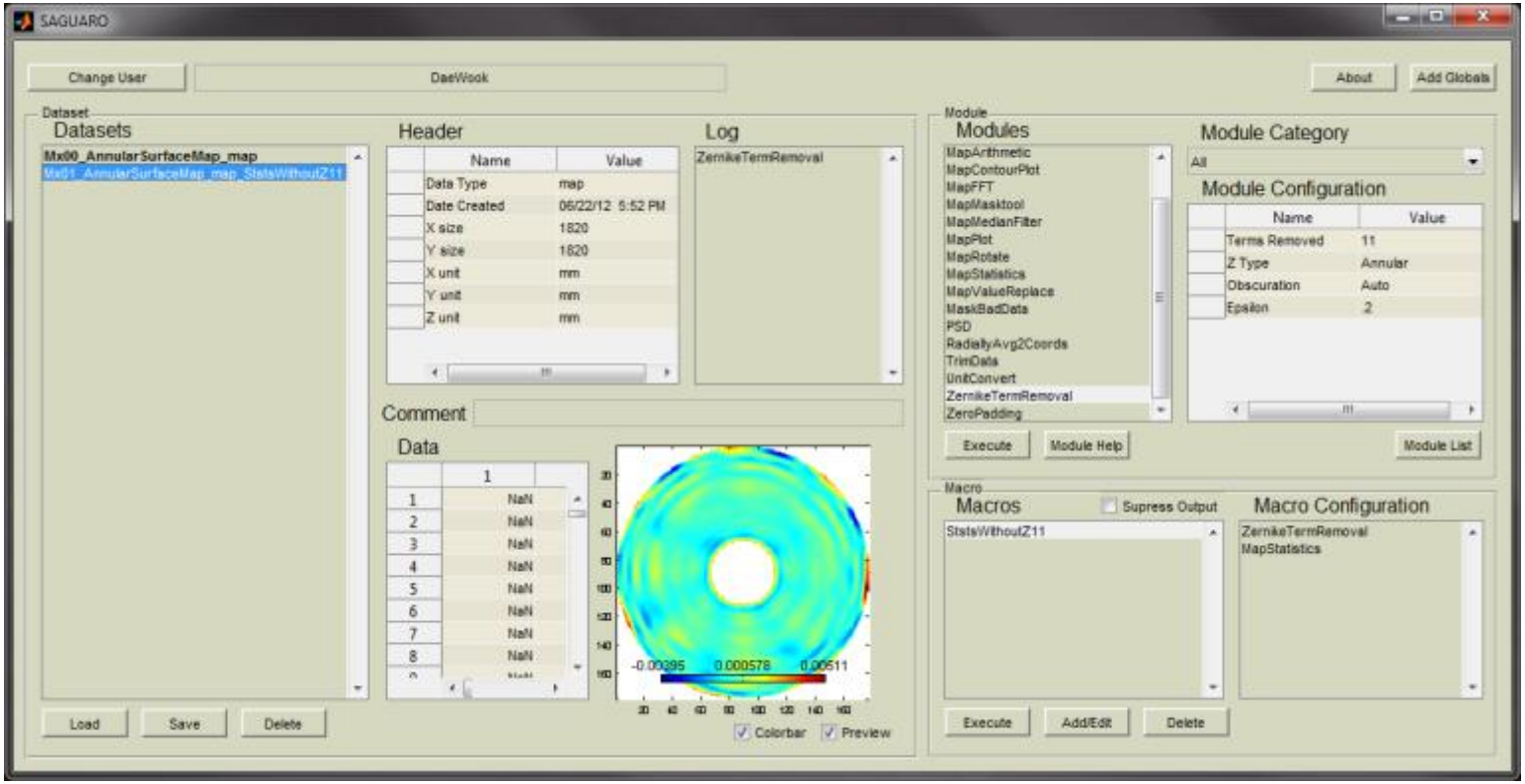
SAGUARO

MATLAB™-BASED DATA PROCESSING PLATFORM



- Matlab™-based data processing platform
- Provide a standard way to manipulate and visualize various types of data
- Operation via the GUI (graphical user interface)
- Data processing by running modules that use proscribed standard formats
- Macro feature allowing pipe-lined modules for complex operations

MAIN PLATFORM GUI
OF SAGUARO



User directory setting (top area), ‘Dataset’ panel (left side),

‘Module’ (top-right) and ‘Macro’ (bottom-right) panels in the main GUI.

STANDARD DATA TYPES
IN SAGUARO

Standard data types for SAGUARO are defined.

Every SAGUARO module assumes the standard data format.

Key to compatibility between modules developed by independent developers.

STANDARD DATA TYPES
IN SAGUARO

Data Type	File extension	Data format	Header (with e.g. parameter values)	Etc.
Map	.map	a X b 2D matrix	$Date Created=08/20/11 1:14 PM $X size=1820 $Y size=1820 $X unit=mm $Y unit=mm $Z unit=mm	'NaN' for background values
Mask	.mask	a X b 2D matrix	$Date Created=08/20/11 4:24 PM	'NaN' for masking area, and 1 for un-masked area
Frequency Map	.freqmap	a X b 2D matrix	$Date Created=08/20/11 3:03 PM $X Max Frequency=0.048626 $Y Max Frequency=0.048626 $X unit=1/mm $Y unit=1/mm $Z unit=mm	'NaN' for background values
Zernike Coefficients	.zernike	a X 3 2D matrix	$Date Created=06/13/12 1:25 PM $Radius=10 $Radius unit=mm $Height unit=nm $Obscuration Ratio=0.1	1st column: Zernike Coef., 2nd column: m, 3rd column: n (where Z_m^n)
Layermap	.layermap	a X b X c 3D matrix	$Date Created=06/13/12 11:59 AM $X size=10 $Y size=10 $X unit=mm $Y unit=mm $Layer unit=nm, µm $Layer Label=peaks, Airy function	a X b part is defined same as 'Map' data type. This data type can store multiple (*i.e.* c) maps. There is an empty line between a X b maps.
Coordinates	.coordinates	a X b 2D matrix	$Date Created=06/13/12 12:16 PM $Column unit=mm, mm, nm $Column Label=x position, y position, Sinc function	Each column may represent any list of data. (*e.g.* 1st column: x, 2nd column: y, 3rd column: z)
General	.general	undefined	undefined	Arbitrary user-defined data type

Note: Templates for each data type can be found in the "Templates" folder in SAGUARO.

MODULES
IN SAGUARO

Greatest power of SAGUARO is provided by its flexibility using the plug-and-execute module features.

Main SAGUARO platform only provides a convenient environment for the modules, and controls the data traffic between them.

Actual data analysis or visualization is performed by modules.

A module can contain almost any user-defined MATLAB™ functions, which follows a proscribed format to communicate with the SAGUARO main platform.

Numerous modules already have been written and included in the module library (more than 25 modules in SAGUARO 1.4).

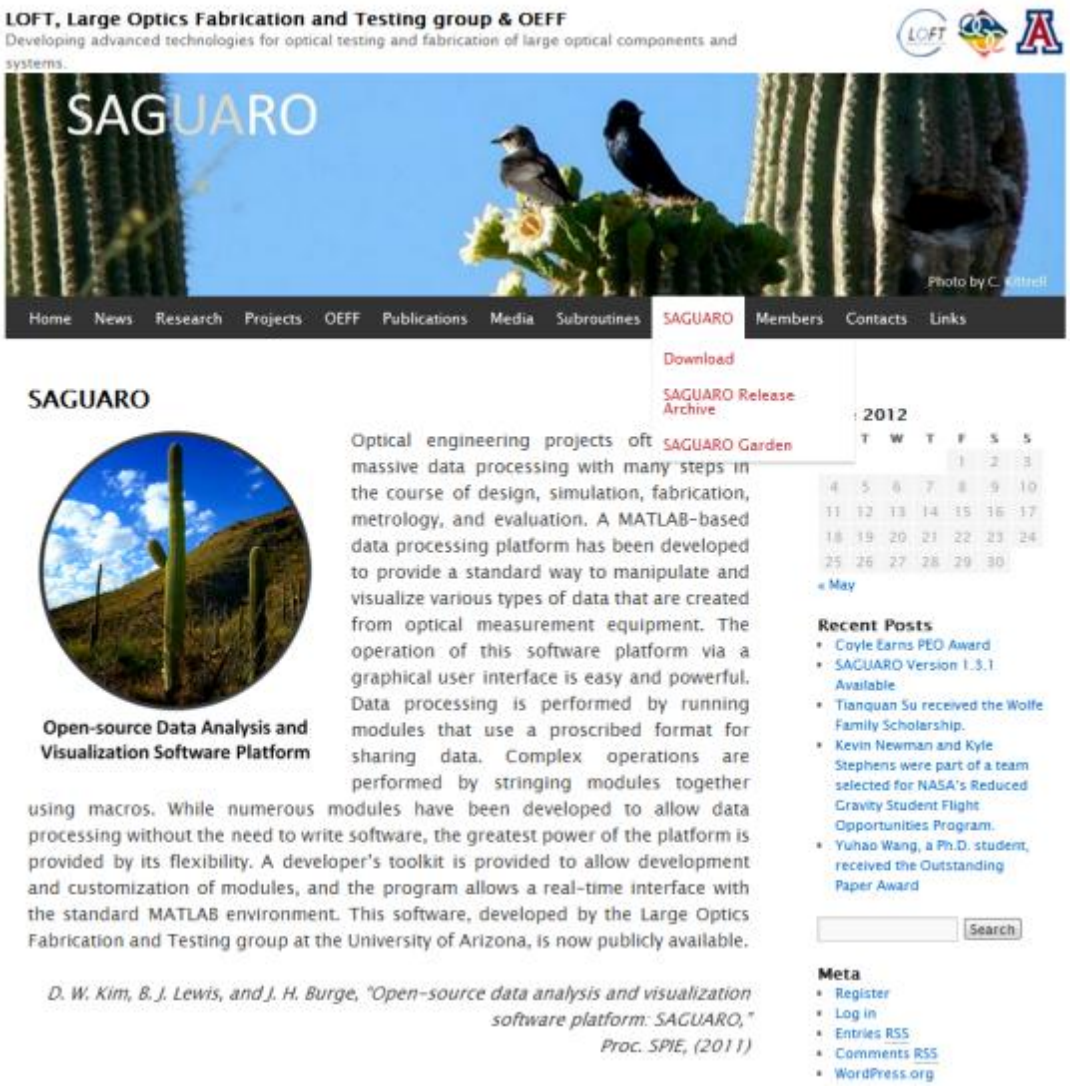
Open-source Data Analysis and Visualization Software Platform

DEMO

USING SAGUARO 1.4

CURRENT RELEASE V. 1.4

HTTP://WWW.LOFT.OPTICS.ARIZONA.EDU/SAGUARO/



THANK YOU.