Altair Compose™

Math, Scripting, Data Processing and Visualization

△ Altair


```
[T,X] = ode45(@Func,T, X, options);
y = readvector(file,1,1,3);
p = polyfit(X,Y,6);
x1 = polyval(p,X);
t1=linspace(0,t,1000);
y1=fft(h);
y2=sin(2*pi*fc*t1);
plot (abs (ft));
```

Altair Compose™ enables engineers, scientists, and product creators to efficiently perform calculations one at a time or grouped together in the form of scripts facilitating process automation. Compose also enables the analysis, processing, and visualization of data such as from CAE or test results. It is an interactive & unified programming environment for all types of math – including matrix analysis, differential equations, signal processing, control design, optimization, and much more.

Product Highlights

- High-level matrix-based interpreted language for numerical computing
- Integrated development environment for authoring and debugging all types of math including multi-language support
- Built-in connectivity to pre/post-process CAE data or test data
- Extensive math libraries:
    - Statistical data analysis
    - Matrix analysis
    - Differential equations
    - Signal processing
    - Control Design
    - Optimization
    - Interactive 2D & 3D plotting

Learn more:
altair.com/Compose

Benefits

Rapid Algorithm Development
A comprehensive set of tools enables rapid development of standard and custom computations. The matrix-based language, authoring, and debugging tools -- along with access to a broad set of math libraries and utilities -- cover a wide range of users' needs. Users can also explore multiple approaches and find solutions faster than with spreadsheets or traditional programming languages such as C/C++.

Open, Compatible, Interoperable Platform
The multi-language environment of Compose enables the combination of the OpenMatrixLanguage (OML) with scripts written in Tcl/Tk or Python. Since OML is not only easy-to-use but also compatible with Octave and MATLAB®, Compose is a powerful platform to integrate knowledge formulated in various programming languages.

Easy Engineering Data Access and Processing
Built-in suite of engineering calculations and Computer Aided Engineering (CAE) data and result readers provide quick access to a large set of data formats for pre and post-processing needs. Data can also be exported to various CAE file formats.

## Capabilities

Powerful and Flexible Programming
- Matrix based data structure
- Fully interpreted
- Compatible with Industry standards
- Built-in and user-defined functions
- Literals, data types, strings, variables & assignments, indexing operators, expressions & Statements,
- Flow of control & looping
- Interactive or Batch-mode execution
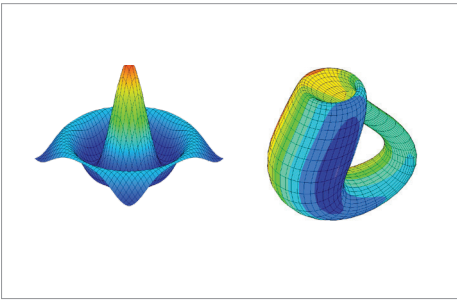
Rich 2D & 3D data visualization
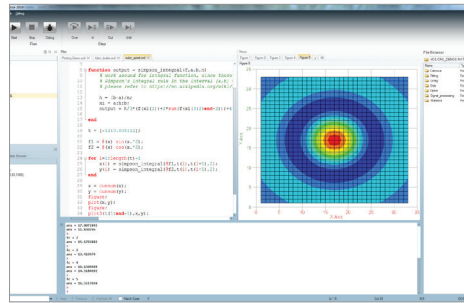
*Modern Integrated Development Environment
with a powerful debugger*
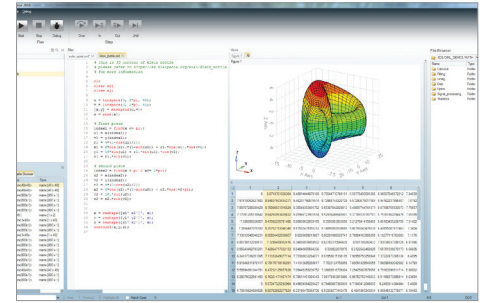
*Variable browser with options to easily monitor
and edit variable values during debugging*

Integrated Development Environment

- A fully featured command window with command completion, code editing and display print command outputs during script execution from the editor allow for visual and interactive code inspections during runtime

- Modern script editor with syntax highlighting, smart indentation, collapsible sections including code folding, bookmarking, searching and toggle to display on/off line numbers

- Script editor allows users to split the screen into multiple views for more interactive authoring and execution

- Multi-language environment with support for OML, Python, & Tcl/Tk

- Powerful debugger with options to easily monitor variable values via watch window, track paths traced while executing scripts via call stack window and display all breakpoints in the debugging session via the breakpoints window

- Intuitive project browser with a hierarchical structure of all the scripts, plots and matrices for easy navigation

- File browser allows direct access to existing program files on disk

- Variable browser displays all the user-generated and global workspace variables including name, value, type and scope. Options to easily monitor variable values during debugging

- Command history window not only displays all commands entered while programming but also enables quick execution with support for double-clicking on each command or drag/drop into the command window

Extensive Commands and Math Libraries

- Elementary math
- Logic operators
- Linear algebra
- Vectors & Matrices
- System commands
- Time commands
- Trigonometry commands
- Polynomial math
- Calculus
- Differential equations
- Signal processing
- Statistical analysis
- Control design
- Optimization
- CAE data readers
- String operations
- Plotting

Data Visualization, Plotting and Reporting

- Support for various 2D & 3D plots
- Plot properties and attributes can be modified easily and interactively with context menus to set plot titles, labels, axis labels, legends & tick mark labels
- Zoom and pan support
- Report generation

Connectivity

Tools to read and extract data from CAE results, with especially tight connectivity to HyperWorks

Open Matrix Language (OML) Interpreter

- Interpreter for enhanced interaction to support interruption of long scripts
- Provides an extension to the variable browser to support additional objects; includes syntax highlighting and auto completion and provides all the debugging features

Easy GUI Creation

- Tailor your scripts to your organization
- Add dialog boxes to build your own customized graphical user interfaces (GUIs)
- Enables easy and intuitive re-usability of your specialized utility programs
- Allows experts to deploy many tools to end users
- Enables flexibility and convenience when providing program inputs

For more information