MASTtreedist 1.0

User Manual

07/04/12

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# **MASTtreedist Installation Instructions:**

1) Download and install Mesquite1.01 class files (Mesquite1.01 is compatible with Tree Set Viz 2.1:treecomp-classfile-022004.tar)from this link:

http://mesquiteproject.org/mesquite1.01/mesquite/download/download.html

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The packages here include the base system and several specialized packages (parsimony, likelihood, simulations, multivariate analysis, coalescence). There are example data files. Please see the comments on the page about <u>publishing results</u> from Mesquite. Please email us (info@mesquiteproject.org) with questions or comments about downloading and installing Mesquite. Mesquite requires Java 1.1 or higher; see installation instructions for details.

#### Macintosh OS

- installation instructions
- .dmg (Disk image) file (this may not work on versions of the Mac OS prior to OS X)
- .sit (Stuffit) file

#### Windows

- installation instructions
- installer
- .zip file

### UNIX/LINUX

- installation instructions
- .tgz file

The Mesquite manual is included in the downloads below, as html pages. The manual can also be downloaded as a single <u>pdf file</u>, which can be more conveniently printed.

2) Download and install the Tree Set Viz module (treecomp-classfile-022004.tar). This is correspondent class files available along with the source code (treecomp-source2.1.tar.gz). The treecompsource2.1.tar.gz is the most current source code available from the website:

http://comet.lehman.cuny.edu/treeviz/treeviz\_unix.html



## Window Managers

Mesquite attempts to place windows in particular places on the screen for ease of use, using standard Java calls. Some window managers overri need to change your window manager if this sort of thing is happening.

### **Tree Set Visualization**

Step 1: Click on this button to download the treecon p module. Save this file to your computer. treecomp-classfiles.tar.gz

Step 2:Decompress this file and take the resultant folder "treecomp", which contains the Mesquite package and place it in the Mesquite director

Stop 3. For the source files, click this button. You can put the source anywhere, but it might be more convenient to put it in a new folder and save

*source-2.0.tar.gz* directory. treecomp-source-2.1.tar.gz

- Mesquite © W. Maddison & D. Maddison 2002-2003
- Tree Set Visualization Module Center for Computational Biology and Bioinformatics, University of Texas at Austin; and Mathe CUNY
- 3) Create a folder "treecomp" under the Mesquite program folder *"Mesquite Folder/mesquite*" and put treecomp class file there.
- 4) Thirdly, create a folder named "*MAST*" under "treecomp", and put all the class files of MASTtreedist into "*MAST*".

Run the Mesquite program using the following command line in Windows or Linux

Windows:

java -cp C:\hong\Mequite\_folder mesquite.Mesquite

Linux:

java -cp ~hong/Mequite\_folder mesquite.Mesquite

If want to compile MAST.java, run the following command line in Windows or Linux (the MAST.java shall reside in the proper folder with Mesquite and Tree Set Viz files):

Windows:

javac -cp C:\hong\Mesquite\_folder mesquite/treecomp/MAST/MAST.java

Linux:

javac -cp ~hong/Mesquite\_folder mesquite/treecomp/MAST/MAST.java

## How to run the program:

When Mesquite is reopened and a file is loaded, the Tree Set Visualization module should be accessible with the following steps:

1) Open a file (using the file "alltreesoneblocknodups.trees" from Hibbett data as an example) in Mesquite, then click on "Taxa: Untitled Block of Taxa".



2) Select "Window", and the pop-up window of the "Tree Set Visualization 2.0"

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		8	Panus rudis	2	Mesquite Log
		7	Antrodia carbonica	2	Mesquite Projects and Files
		8	Lentinus tigrinus	2	
		9	Trametes suaveolens	?	New Examples Navigator
		10	Polyporus squamosus	?	New Picture Window
		11	Fomes fomentarius	?	Tree Set Visualization 2.0
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		13	Heterobasidion annosum	?	
		14	Hericium ramosum	?	
		15	Echinodontium tinctorium	?	
		16	Lentinellus omphalodes	7	
		17	Lentinellus ursinus	?	
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3) Select "Stored Trees" then click "OK"

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	2	Tremella	?						
*	з	Auricularia auricula judae	?	Select poneblocknodups.trey					
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	5	Meripilus giganteus	?	m "altrees do you want to visualize?					
	6	Panus rudis	?	Stored Trees of Taxa					
	7	Antrodia carbonica	?	Default Trees Simulated Trees Modify Current Tree Filter Trees from Other Source Transform Trees from Other Source Randomly Modify Current Tree Trees Directly From File					
	8	Lentinus tigrinus	?						
	9	Trametes suaveolens	?						
	10	Polyporus squamosus	?						
	11	Fomes fomentarius	?						
	12	Bondarzewia berkleyi	?						
	13	Heterobasidion annosum	?						
	14	Hericium ramosum	?	Bhare/oroiects/Tree					
	15	Echinodontium tinctorium	?	Supplies trees stored, for instance in a file.					
	16	Lentinellus omphalodes	?	top/paper-p/MAST					
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4) Select the pop-up window for the "MAST(Maximum Agreement Subtree) tree Difference".



# **Case studies**

 Figure 1: using "alltreesoneblocknodups.trees" from Hibbett data as input file, "MAST" (left) metric differentiate the structure of three trees, highlighted as tree 19 (+), tree 22(x), and 37 (°), and tree 19 and 37 are close each other. However, Robinson-Fouds (right) could not differentiate their relationships.



2) Figure 2: using "example\_scissor.nexus" as input file, "MAST" (left), show distinct patterns(e.g., "cissor" "mushroom", "Key west archipelago" for the trees, where Robinson-Foulds (right) could not.



Figure 3: Selected trees cladograms for "Key west archipelago" shape cluster using "MAST" metric





Figure 4: selected trees cladograms in "Scissor" shape cluster using "MAST" metric

Figure 5. Selected trees for closest and farthest pair of trees cladograms in "Scissor" shape cluster using "MAST" metric





