
The Mutatron v1.0b1

Created by [Dale M. Greer](#),

using Robert Dierkes' Trigrid Sample as a starting point, and with some help from Tumbler by Nick Thompson and Pablo Fernicola.

- [What is The Mutatron\(tm\)?](#)
 - [How should one speak the name "The Mutatron"?](#)
 - [System Requirements](#)
 - [User Guide](#)
 - [The Mutatron Window](#)
 - [Spike Editor](#)
 - [Bananoid Editor](#)
 - [Menu Commands](#)
 - [File Menu](#)
 - [Edit Menu](#)
 - [Display Menu](#)
 - [Geometry Menu](#)
 - [Texture Menu](#)
 - [Spikes! Menu](#)
 - [Other Stuff](#)
 - [A Cool Effect](#)
 - [Problems](#)
 - [Disclaimer](#)
 - [Distribution](#)
 - [Contacting the Author](#)
-

What is The Mutatron(tm)?

The Mutatron adds spikes to 3DMF meshes. It also displays 3DMF objects in various QuickDraw 3D styles, lets you add vertex normals and can map pictures over an object with uv-parameters. Also, it can create several basic shapes, so you don't need to have a 3DMF object on hand to see what it can do.

How should one speak the name "The Mutatron"?

The name "The Mutatron" is pronounced "The Myutahtrohn," and should be spoken in a low, guttural voice, like that of Arnold Schwarzenegger, or, for an older generation, Henry Kissinger. Select the "Play" item under the "Sound" menu to hear a selection if you are using SimpleText to read this document. If you have the Speech Manager installed, select this text - The Myutahtrohn - then select "Speak Selection" under the "Sound" menu. The Speech Manager incorrectly pronounces the correct spelling as "Myutaytren."

The definite article "The" should always precede the noun "Mutatron," i.e., one should not call The Mutatron by the appellation "Mutatron" alone. This rule does not apply to those whose languages have no definite article. In Japanese, the romaji for "Mutatron" should be "Myutaturonu." In German The Mutatron is neuter, Das Mutatron, but in Italian and Spanish it should be masculine, Il Mutatron and El

Mutatrón, respectively. However, in French it should be feminine - La Mutatron. In Arabic languages, Al Mutatron is correct.

System Requirements

The Mutatron cannot run without QuickDraw^a 3D 1.0.3. Previous version of QD3D have a bug that prevents The Mutatron from operating. QuickDraw 3D only runs on Power Macs with System 7.5.1 with at least 16MB of RAM. At this writing, The Mutatron has been tested on a Power Macintosh 6100/60.

User Guide

The Mutatron Window

Rotation - Hold the mouse button down in The Mutatron window and move it around to rotate the model. If you hold the mouse in the same place for more than a quarter of a second, rotation will cease.

Translation - Hold the shift key down with the mouse down in The Mutatron window and move it around to move the model around in the frame. The center of rotation moves with the model. Using the option key instead will move the model but leave the center of rotation in the center of the view. This feature is not yet perfected. To get back to model-centric rotation, hold down the command key with the mouse button down.

Zooming - Hold the control key down with the mouse down in The Mutatron window and move it toward you to zoom in on the model, away from you to zoom out.

Close Box - The Close Box quits The Mutatron. Not very Mac-like! Will be fixed in future.

Spike Editor

Per Cent Spikiness - This slider determines how many vertices should have spikes.

Base Length of Spikes - This slider varies the base length of all the spikes.

Length Randomizer - This slider varies the randomness of the length of each spike.

Random Distribution - Distribute spikes randomly over the object.

Regular Distribution - Distribute spikes regularly over the object. The distribution is determined by the indices of the vertices. QuickDraw 3D does not always assign vertex indices in the manner you might expect, so the distribution may appear to be random.

Bananoid Editor

A bananoid is an ellipsoid curved along its latitudinal axis. The suffix "-oid" is borrowed from the Greek meaning "resembling" or "like."

Bananoid Radius - Slider varies the radius of the bananoid.

Bananoid Angle - Slider varies the angle of the bananoid.

Longitude Step Angle - Slider varies the longitudinal angle between adjacent vertices.

Latitude Step Angle - Slider varies the latitudinal angle between adjacent vertices.

Menu Commands

File Menu

New... - Disabled

Open... - Open a 3DMF file.

Close - Disabled

Save As Text... - Save the model in 3DMF text format.

Save As Binary... - Save the model in 3DMF binary format.

Save Window As PICT... - Save the model window as a PICT file.

Quit - Terminate The Mutatron.

Edit Menu

All disabled

Display Menu

Renderer - The Renderer menu item has a submenu that allows you to select from the three main rendering styles - Wireframe, Interactive Software, Interactive Hardware. The default is Interactive Software.

Interpolation - The Interpolation menu item has a submenu that allows you to select from the three interpolation styles - Flat, Per Vertex, Per Pixel. Interpolation doesn't work unless the object has surface normals. Without surface normals, interpolations other than Flat still appear flat, that is, you can see all the faces that make up the object. With surface normals and interpolation set to Per Vertex or Per Pixel, the surface appears smoothed. The default is Per Vertex.

Shader - The Shader menu item has a submenu that allows you to select from the three shader styles - NULL, Lambert, Phong. The default is Phong.

Backfacing Style - The Backfacing Style menu item has a submenu that allows you to select from the three Backfacing styles - Draw Both, Remove Backfacing, Flip Normals. The default is Draw Both.

Fill Style - The Fill Style menu item has a submenu that allows you to select from the three Fill styles - Filled, Edges, Points. The default is Filled.

Animation - The Animation menu item has a submenu that allows you to select from the three animation options - Don't Animate, Animate Freely, Animate With Friction. When Animate Freely is selected, the model will continue rotating after you have stopped rotating it with the mouse. Animate With Friction

does the same, except that the model slows down after a short while. The default is Animate Freely.

Background Color... - Brings up a standard color picker to set the background color.

Geometry Menu

Mesh Grade - The Mesh Grade menu item has a submenu that allows you to select from the three mesh grades - Coarse, Medium, Fine. The default is Medium.

Bananoid Editor - This item brings up the Bananoid Editor dialog. See Below.

The other items on the Geometry menu create various mesh objects - Flat, Torus, Lumpy Torus, Sphere, Ellipsoid, Bananoid, Beanoid, Cone, Pipe, Steps, Spring, Bananoid 2, Bananoid 3, Pancake. I added a few to Robert Dierkes' original list. I will may develop this into a generalized mathematical object creator.

Texture Menu

None - Removes texture from object. This is the default.

Geometry - Maps texture over entire geometry of object. Objects not created by The Mutatron must have uv-parameters for this to work.

Face - Maps texture over each face of object. Objects not created by The Mutatron must have uv-parameters for this to work.

Color... - Brings up a standard color picker to set the object color. Disabled if Geometry or Face texture is selected.

Picture... - Brings up a standard file selection dialog box to open PICT file to map onto model. Disabled if texture is set to None.

Add Vertex Normals - Add normal vectors to all vertices of object. This enables smoothing via Interpolation, q.v.. Normals are calculated by adding up the face normals of the faces connected to each vertex. Executing Add Vertex Normals a second time will recalculate all normals.

Remove Vertex Normals - Remove vertex normals from object.

The rest of the items are PICTs in The Mutatron's resources that you may map onto surfaces. Most are inherited from Robert Dierkes original Trigrig Sample, but I added a couple.

Of note here is the Sundial image, which is a new kind of sundial I have invented. The vanes of the dial are determined mathematically from the motion of the Sun.

Spikes! Menu

Use Existing Vertices - This option causes the Spike Editor to distort the object by spikifying its existing vertices. The spikes created are not actually visible until the Spike Editor is invoked to change the size of the spikes and the percent of spikes visible.

Add Face Vertices - This option causes the Spike Editor to distort the object by spikifying vertices which have been added to the center of each face in the object. The spikes created are not actually visible until

the Spike Editor is invoked to change the size of the spikes and the percent of spikes visible.

Recalculate Distribution - Recalculate the distribution of spikes over the object.

Edit Spikes - Invoke the Spike Editor.

Other Stuff

A Cool Effect

Put some spikes on an object with "Use Existing Vertices" selected. Select "Add Normals" (assuming "Per Vertex" interpolation), then reduce the "Per Cent Spikiness" to zero.

Problems

The Mutatron won't be very forgiving if it runs out of memory. It has almost no provisions for preventing a crash in such cases. Some operations reset variables like camera zoom, model position, etc., or qualities like vertex normals that you'd rather not be reset. Camera position is not automatically calculated, so some models may appear very small or very large, depending on their scale. At present, the only remedy is to zoom in or out to get a better view.

The Mutatron has no preferences.

I'm sure there are more than this, but I'm itching to get this thing out. Please let me know of any bugs or things that annoy you about The Mutatron.

Disclaimer

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Distribution

This version (v1.0b1) of the Mutatron is freeware. Send a postcard if you like it. You may distribute it freely, provided you leave the software and the accompanying documentation unchanged, and send me a message about how you are distributing it. You can include The Mutatron in CD-ROMs and other software collections, as long as you notify me first.

Contacting the Author

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I welcome any questions, comments, bug reports, and feature requests you may have. I especially invite

criticism and input regarding the user interface, which I have not spent much time on.

Dale M. Greer

Friday, February 16, 1996

Change History

The Mutatron v1.0b2 - 29 February, 1996

1. 1. Added code to alert user and exit application if QuickDraw 3D is not installed.
2. 2. Eliminated crashing on view hints.
3. 3. Eliminated crashing on non-mesh objects.
4. 4. Eliminated some memory leaks.