nurbsData Documentation

NURBS WIREFRAME AND COMPONENTS RENDERER
PLUG-IN FOR MAYA 6.5/7.0
VERSION 1.5

Overview

To install the nurbsData Plug-In follow the instructions available in the 'README.TXT' file. Don't forget to test all the sample scenes.

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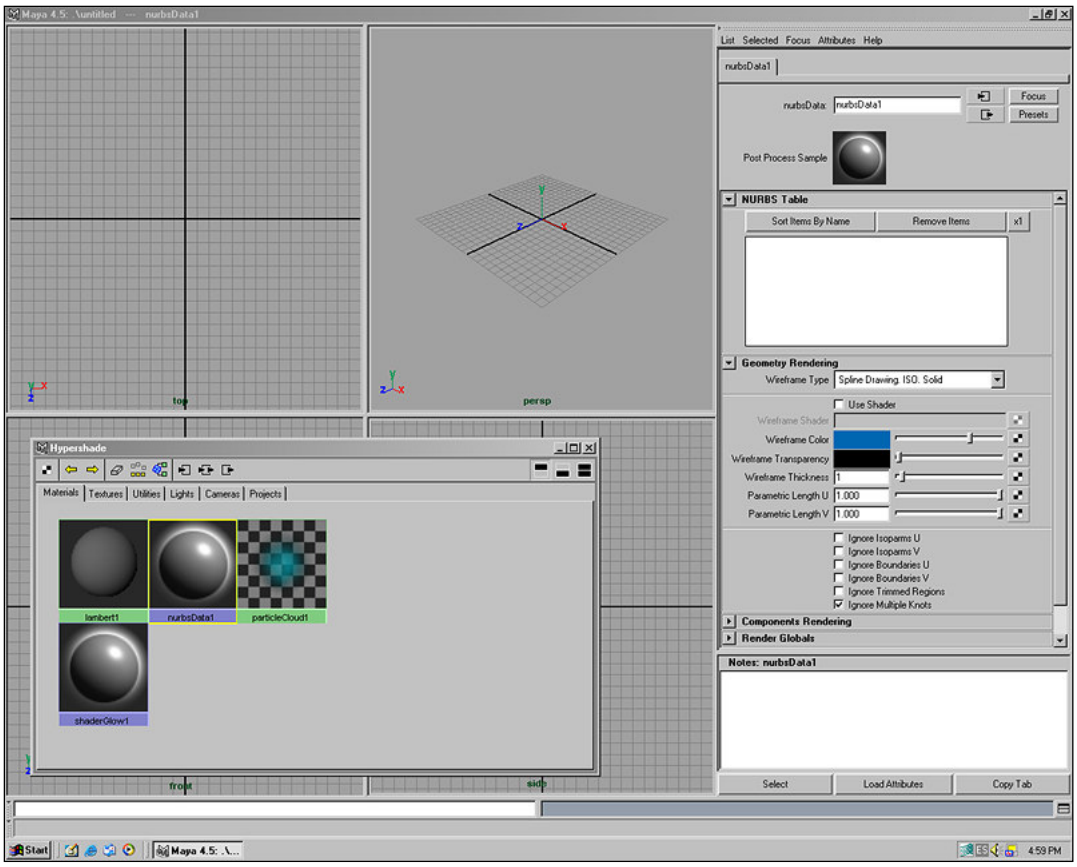
nurbsData post-process rendering node Plug-In allows Maya users to render both NURBS wireframe and components in software rendering.

nurbsData supports full NURBS curves and surfaces wireframe as well as full NURBS curves and surfaces components. Its unique and state-of-the-art engine renders high-quality splines as well as is capable of sampling every Maya shader/shading network in order to shade the wireframes. Since nurbsData works as a post-process node it accesses to the rendering frame buffer, this feature allow users to mix backgrounds, solids, wireframe and components directly in Maya avoiding the compositing on another package. Its renderer also supports Hidden-Line computation so that wireframe and solids can be mixed properly. nurbsData provides a wide range of attributes to control the colors, transparencies, patterns, shapes and thicknesses per NURBS object.



SCREENSHOT: nurbsData in the Hypershade.
nurbsData node is available next to the 'lambert1' shader within the 'Materials' tab.
NOTE: nurbsData's post-processing functionality is similar to the Maya's 'shaderGlow' one.

To see rendering examples go to nurbsData's gallery area:
products.provide3d.com/nurbsData/gallery

nurbsData is capable of rendering both, NURBS curves and surface objects.
In order to render a NURBS object, it must be assigned to the nurbsData's NURBS Table.

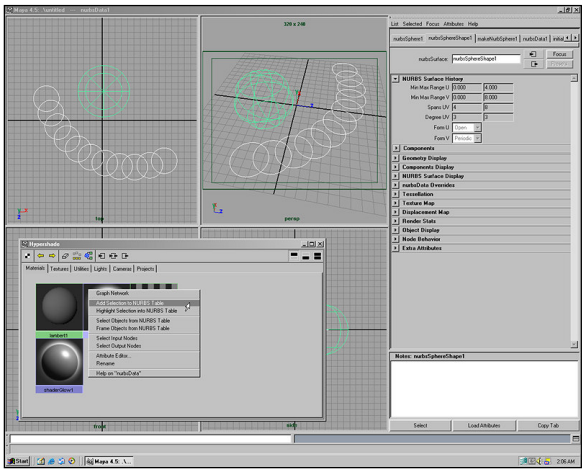


Figure #1.

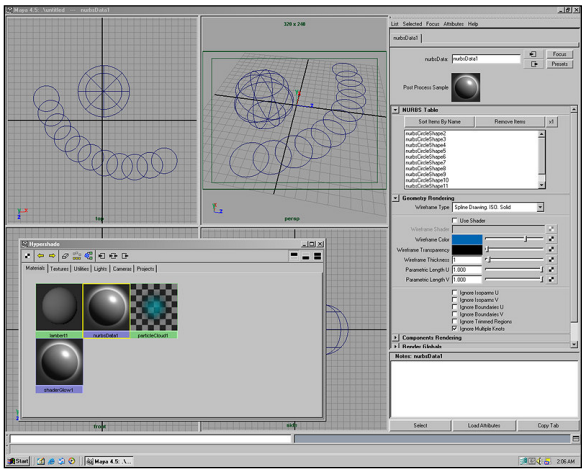


Figure #2.

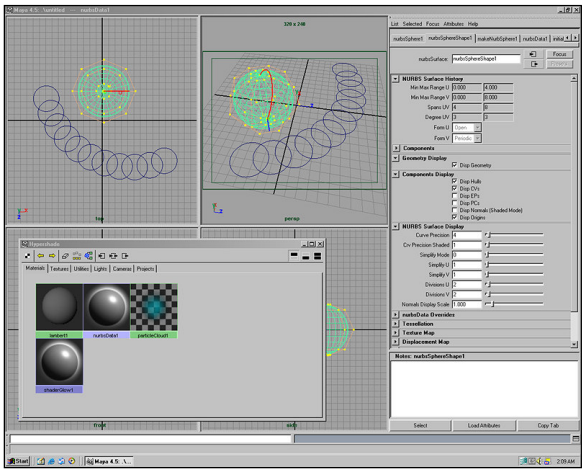


Figure #3.

You can make a selection from the Viewport/Hypegraph/Outliner panel and then use the 'Add Selection to NURBS Table' option of nurbsData's Pop-Up menu.

Every time that the 'Add Selection to NURBS Table' option is used the selection is transfered into the NURBS Table.
See the Screenshot (Figure #1) *.

There are available two buttons on the top of the NURBS Table to either, sort the items or remove them from it.
See the Screenshot (Figure #2).

Once a NURBS object is assigned to the NURBS Table its attributes can be queried by the nurbsData so that its wireframe and components display settings be rendered during post-process.
See the Screenshot (Figure #3).

For a complete description of the attributes supported by the nurbsData see the 'Technical Information' in this documentation, 'Attributes supported per object by nurbsData' (Page #9).

There are also available attributes to control the patterns, colors and thicknesses for the wireframe and components in the nurbsData node, see the 'Technical Information' in this documentation for a complete description of supported attributes (Page #5) **.

(*) Only the objects listed into the NURBS Table will be rendered by the nurbsData during post-process.

(**) By default all the NURBS objects are affected by the wireframe and components settings of the nurbsData node. To control wireframe and components settings per object see the 'Overriding' section in this documentation (Page #4).

Overriding

As previously mentioned, all the NURBS objects are affected by default by the settings of the nurbsData attributes such as colors, patterns and thicknesses.

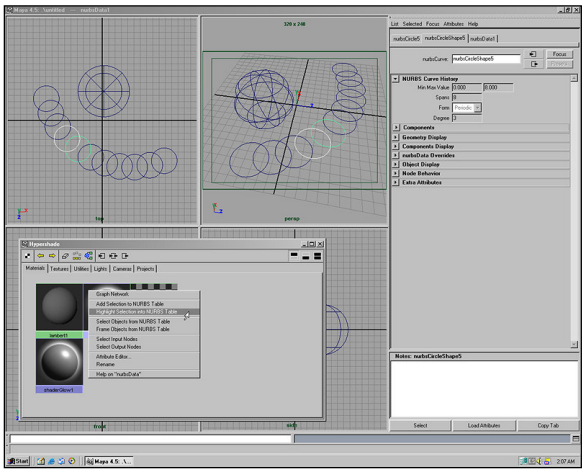


Figure #4.

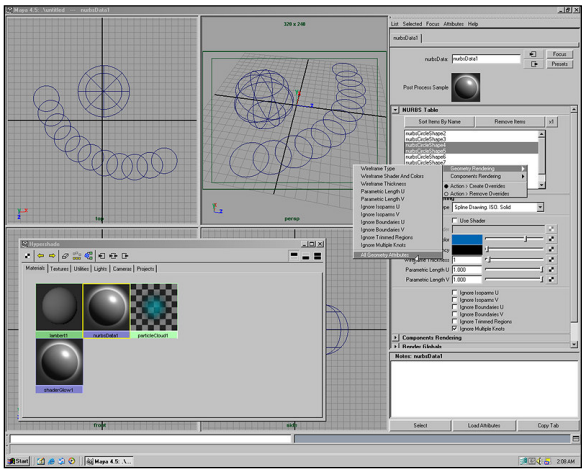


Figure #5.

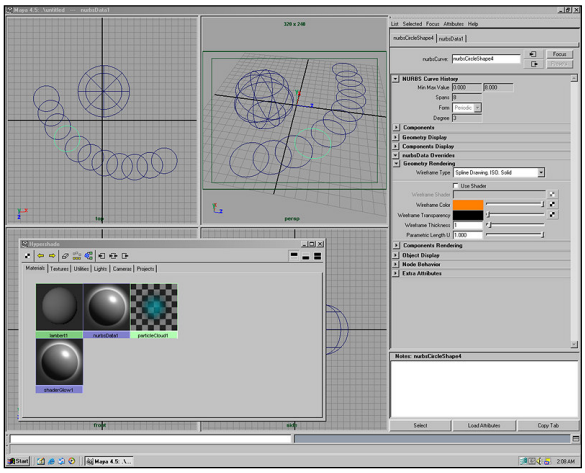


Figure #6.

To control rendering settings per object you have to create 'Overrides' by using the NURBS Table's Pop-Up menu.

To create 'Overrides' mark first the objects that you want to apply 'Overrides' by highlighting the items into the NURBS Table. There are two options to highlight the items:

1) By using the left mouse button and pointer directly into the NURBS Table (You can also use the Shift/Ctrl/Alt keys to select/deselect more than one item).

2) By using the 'Highlight Selection into NURBS Table' option of the nurbsData's Pop-Up menu to transfer the selected objects from the Viewport/Hypegraph/Outliner panel into the NURBS Table as highlighted items. See the Screenshot (Figure #4).

Once you have highlighted the items into the NURBS Table, use its Pop-Up menu to create the 'Overrides' *.
See the Screenshot (Figure #5).
You will be able to override any nurbsData attribute. See the 'Technical Information' in this documentation for more details) (Page #5).

Now you can find the created 'Overrides' within the 'nurbsData Overrides' section of the NURBS object.
See the Screenshot (Figure #6).

(*) The same process can be used to remove the 'Overrides' from the objects, by using the 'Action > Remove Overrides' option instead.

NODE NAME: nurbsData
NODE VERSION: 1.5
NODE TYPE: Dependency Graph Rendering node.
NODE CLASSIFICATION: Postprocess/Glow
NODE ID: 0x81198

FLAGS REFERENCES:
C=Connectable (The attribute can be connected to a compatible attribute of another node)
S=Stored (The value of the attribute is stored with the scene file)
K=Keyable (The attribute can be keyframed)
O=Overridable (The value of the attribute can be overrided).

Input Attribute Name [Description]	Type [Min value; Max value] [Flags]
Wireframe Type [Controls the Wireframe Pattern]	Enum [0=Spline Drawing. ISO. Solid; 1=Spline Drawing. ISO. Dashed. Type 1; 2=Spline Drawing. ISO. Dashed. Type 2; 3=Spline Drawing. ISO. Dashed. Type 3; 4=Spline Drawing. ISO. Dashed. Type 4] [SKO]
Use Shader [Enables the Wireframe Shading]	Bool [0; 1] [SKO]
Wireframe Shader [Displays the Shading Group node/name used to shade the Wireframe]	Message [] [CSO]
Wireframe Color [Controls the Wireframe Color]	Compound Float3 [0.0; 1.0] [SKO]
Wireframe Transparency [Controls the Wireframe Transparency]	Compound Float3 [0.0; 1.0] [SKO]
Wireframe Thickness [Controls the Wireframe Thickness; Pixel Units]	Int [0; 32] [SKO]
Parametric Length U [Controls the Parametric Percentage of the curves and surfaces drawing (flow/growth) along U direction]	Float [0.0; 1.0] [SKO]
Parametric Length V [Controls the Parametric Percentage of the surfaces drawing (flow/growth) along V direction]	Float [0.0; 1.0] [SKO]
Ignore Isoparms U [Ignores the drawing of the Intermediate Isoparms along U direction]	Bool [0; 1] [SKO]
Ignore Isoparms V [Ignores the drawing of the Intermediate Isoparms along V direction]	Bool [0; 1] [SKO]
Ignore Boundaries U [Ignores the drawing of the First and Last Isoparms along U direction]	Bool [0; 1] [SKO]
Ignore Boundaries V [Ignores the drawing of the First and Last Isoparms along V direction]	Bool [0; 1] [SKO]

Input Attribute Name [Description]	Type [Min value; Max value] [Flags]
Ignore Trimmed Regions [Draws the surfaces in their Untrimmed forms]	Bool [0; 1] [SKO]
Ignore Multiple Knots [Avoids overlapped Isoparms drawing]	Bool [0; 1] [SKO]

Input Attribute Name [Description]	Type [Min value; Max value] [Flags]
Trim Edge Type [Controls the Trim Edges Pattern]	Enum [0=Spline Drawing. ISO. Solid; 1=Spline Drawing. ISO. Dashed. Type 1; 2=Spline Drawing. ISO. Dashed. Type 2; 3=Spline Drawing. ISO. Dashed. Type 3; 4=Spline Drawing. ISO. Dashed. Type 4] [SKO]
Trim Edge Color [Controls the Trim Edges Color]	Compound Float3 [0.0; 1.0] [SKO]
Trim Edge Transparency [Controls the Trim Edges Transparency]	Compound Float3 [0.0; 1.0] [SKO]
Trim Edges Thickness [Controls the Trim Edges Thickness; Pixel Units]	Int [0; 32] [SKO]
Hull Type [Controls the Hulls Pattern]	Enum [0=Line Drawing. ISO. Solid; 1=Line Drawing. ISO. Dashed. Type 1; 2=Line Drawing. ISO. Dashed. Type 2; 3=Line Drawing. ISO. Dashed. Type 3; 4=Line Drawing. ISO. Dashed. Type 4] [SKO]
Hull Color [Controls the Hulls Color]	Compound Float3 [0.0; 1.0] [SKO]
Hulls Transparency [Controls the Hulls Transparency]	Compound Float3 [0.0; 1.0] [SKO]
Hull Thickness [Controls the Hulls Thickness; Pixel Units]	Int [0; 32] [SKO]
Cv Type [Controls the CVs (Control Vertices) Shape Type]	Enum [0=Box Drawing. Non Filled; 1=Box Drawing. Filled; 2=Circle Drawing. Non Filled; 3=Circle Drawing. Filled; 4=Cross Drawing. Filled; 5=Plus Drawing. Filled] [SKO]
Cv Color [Controls the CVs (Control Vertices) Color]	Compound Float3 [0.0; 1.0] [SKO]
Cv Transparency [Controls the CVs (Control Vertices) Transparency]	Compound Float3 [0.0; 1.0] [SKO]
Cv Thickness [Controls the CVs (Control Vertices) Thickness; Pixel Units]	Int [0; 32] [SKO]

Input Attribute Name [Description]	Type [Min value; Max value] [Flags]
Ep Type [Controls the EPs (Edit Points) Shape Type]	Enum [0=Box Drawing. Non Filled; 1=Box Drawing. Filled; 2=Circle Drawing. Non Filled; 3=Circle Drawing. Filled; 4=Cross Drawing. Filled; 5=Plus Drawing. Filled] [SK]
Ep Color [Controls the EPs (Edit Points) Color]	Compound Float3 [0.0; 1.0] [SKO]
Ep Transparency [Controls the EPs (Edit Points) Transparency]	Compound Float3 [0.0; 1.0] [SKO]
Ep Thickness [Controls the EPs (Edit Points) Thickness; Pixel Units]	Int [0; 32] [SKO]
Pc Type [Controls the PCs (Patches Centers) Shape Type]	Enum [0=Box Drawing. Non Filled; 1=Box Drawing. Filled; 2=Circle Drawing. Non Filled; 3=Circle Drawing. Filled; 4=Cross Drawing. Filled; 5=Plus Drawing. Filled] [SKO]
Pc Color [Controls the PCs (Patches Centers) Color]	Compound Float3 [0.0; 1.0] [SKO]
Pc Transparency [Controls the PCs (Patches Centers) Transparency]	Compound Float3 [0.0; 1.0] [SKO]
Pc Thickness [Controls the PCs (Patches Centers) Thickness; Pixel Units]	Int [0; 32] [SKO]
Normal Type [Controls the Normals Pattern]	Enum [0=Line Drawing. ISO. Solid; 1=Line Drawing. ISO. Dashed. Type 1; 2=Line Drawing. ISO. Dashed. Type 2; 3=Line Drawing. ISO. Dashed. Type 3; 4=Line Drawing. ISO. Dashed. Type 4] [SKO]
Normal Color [Controls the Normals Color]	Compound Float3 [0.0; 1.0] [SKO]
Normal Transparency [Controls the Normals Transparency]	Compound Float3 [0.0; 1.0] [SKO]
Normal Thickness [Controls the Normals Thickness; Pixel Units]	Int [0; 32] [SKO]
Origin Type [Controls the Origins Pattern]	Enum [0=Spline Drawing. ISO. Solid; 1=Spline Drawing. ISO. Dashed. Type 1; 2=Spline Drawing. ISO. Dashed. Type 2; 3=Spline Drawing. ISO. Dashed. Type 3; 4=Spline Drawing. ISO. Dashed. Type 4] [SKO]
Origin U Color [Controls the Origin U Color]	Compound Float3 [0.0; 1.0] [SKO]
Origin V Color [Controls the Origin V Color]	Compound Float3 [0.0; 1.0] [SKO]

Input Attribute Name [Description]	Type [Min value; Max value] [Flags]
Origin N Color [Controls the Origin N Color]	Compound Float3 [0.0; 1.0] [SKO]
Origin Transparency [Controls the Origins Transparency]	Compound Float3 [0.0; 1.0] [SKO]
Origin Thickness [Controls the Origins Thickness; Pixel Units]	Int [0; 32] [SKO]

Input Attribute Name [Description]	Type [Min value; Max value] [Flags]
Enable Rendering [Enables nurbsData's post-process rendering]	Bool [0; 1] [SK]
Spline Precision [Controls the Splines drawing Quality (Number of segments per span along U/V)]	Int [1; 128] [SK]
Dashes Scale [Controls the scale of the dashed Patterns]	
Antialiasing [Controls the Antialiasing Type]	Enum [0=None; 1=Geometry; 2=Components; 3=Geometry + Components] [SK]
Filtering Size [Controls the Antialiasing Filtering]	Float [0.2; 1.0] [SK]
Z-Buffer (Hidden-Line) [Controls the Hidden-Line Type (Splines/Lines visibility computation)]	Enum [0=None; 1=Geometry; 2=Components; 3=Geometry + Components] [SK]
Z-Buffer Offset [Controls the rendering Offset of the Z-Buffer channel (Splines/Lines visibility computation)]	Float [0.001; 0.01] [SK]
Ignore Geometry [Ignores Wireframe rendering]	Bool [0; 1] [SK]
Ignore Components [Ignores Components rendering]	Bool [0; 1] [SK]
Ignore Overrides [Ignores any Overrides]	Bool [0; 1] [SK]
Display Status [Prints rendering progress in Maya's status bar]	Bool [0; 1] [SK]

Attributes supported per object by the nurbsData Renderer.

NURBS curves - Attribute Name *	Attribute Editor Section
Disp Geometry (Display Geometry)	Geometry Display
Disp Hulls (Display Hulls)	Components Display
Disp CVs (Display Control Vertices)	Components Display
Disp EPs (Display Edit Points)	Components Display
Visibility	Object Display
LOD Visibility	Object Display
Template	Object Display
Enable Overrides	Drawing Overrides
Display Type	Drawing Overrides
Visible	Drawing Overrides

(*) Only for the objects assigned to the NURBS Table.

NURBS surfaces - Attribute Name *	Attribute Editor Section
Disp Geometry (Display Geometry)	Geometry Display
Disp Hulls (Display Hulls)	Components Display
Disp CVs (Display Control Vertices)	Components Display
Disp EPs (Display Edit Points)	Components Display
Disp PCs (Display Patches Centers)	Components Display
Disp Normals (Display Normals)	Components Display
Disp Origins (Display Origins UVN)	Components Display
Divisions U (Number of Divisions along U)	NURBS Surface Display
Divisions V (Number of Divisions along V)	NURBS Surface Display
Normals Display Scale (Normals Length)	NURBS Surface Display
Double Sided	Render Stats
Opposite	Render Stats
Visibility	Object Display
LOD Visibility	Object Display

NURBS surfaces - Attribute Name *	Attribute Editor Section
Template	Object Display
Enable Overrides	Drawing Overrides
Display Type	Drawing Overrides
Visible	Drawing Overrides

(*) Only for the objects assigned to the NURBS Table.

Tips and Tricks

Best Quality/Performance rendering settings (Maya Render Globals)

Edge Anti-aliasing = Highest Quality
Shading = 2
Max Shading = 3
Multi Pixel Filter = OFF

Best Quality/Performance rendering settings for Hidden-Line (Maya Render Globals)

Edge Anti-aliasing = Highest Quality *
Shading = 3 *
Max Shading = 8 *
Multi Pixel Filter = OFF

(*) The values marked with and asterisk are automatically set when nurbsData's Z-Buffer (Hidden-Line) attribute is turned on.

FAQs

01- Is there a way to quickly assign a texture to the 'wireframe shader' attribute ?
Yes. By creating a 2D/3D Texture directly from the Map Button or by draging and dropping the texture node from the Hypershade onto nurbsData's Wireframe Shader attribute.
A shading network of the following form will automatically be created and assigned:
'2D/3D Texture -> Surface Shader -> Shading Group'.

02- Is there a way to render a wireframe thickness < 1 pixel ?
Yes. By decreasing nurbsData's 'Filtering Size' value. (e.g.: Filtering Size=0.4)

03- Is there a way to improve the splines rendering quality ?
Yes. By increasing nurbsData's 'Spline Quality' value. (e.g.: Spline Quality=32)

04- Is there a way to improve the antialiasing quality ?
Yes. By increasing nurbsData's 'Filtering Size' value. (e.g.: Filtering Size=0.75)

05- Is there a way to improve the hidden-line quality ?
Yes.
1) By increasing the tessellation quality (number of triangles) of the NURBS surface.
2) By increasing nurbsData's 'Z-Buffer Offset' value (e.g.: Z-Buffer Offset=0.005).
3) By increasing nurbsData's 'Spline Quality' value (e.g.: Spline Quality=32).

06- Is there a way to assign a shader or to control colors/thicknesses per object ?
Yes. By creating 'Overrides' using the NURBS Table's Pop-Up menu.
Also, have a look at the 'Overriding' section in this documentation (Page #4).

07- Is there a way to control the splines quality per object ?
No. nurbsData's 'Spline Quality' attribute is a global control.

08- Is there a way to control the dashed scales per object ?
No. nurbsData's 'Dashes Scale' attribute is a global control.

09- Is there a way to shade trim edges as well as the wireframe ?
Yes. By setting 'Trim Edge Thickness'=0. So Trim Edges will take settings from the wireframe section.

10- Is there a way to shade any components ?
No. nurbsData does not support components shading.

11- Is there a way to render glow effects ?
No. nurbsData does not support glow effects.

12- Is there a way to render wireframe shadows ?
No. nurbsData does not support wireframe shadow casting.

13- Is there a way to render objects per layer ?
nurbsData only supports Display Layers. Does not support Render Layers.

14- Is there a way to render fields ?
No. nurbsData is a post-process renderer. Does not support fields rendering.

15- Is there a way to render polygons wireframe ?
No. nurbsData supports NURBS curves and surfaces objects only.
There is a Plug-In called polyData which allows Maya users to render polygons wireframe.
Have a look at PROVIDE3D website: www.provide3d.com

16- How can I purchase the nurbsData FULL version ?
Go to PROVIDE3D's purchasing area: purchase.provide3d.com/howTo
or Contact Us: purchase@provide3d.com

17- I need more info. Where can I find it ?
Have a look at PROVIDE3D website: www.provide3d.com
or Contact Us: products@provide3d.com

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