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20:03 PDT

Project: X3D



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Issue #

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ID	Project	Category	View Status	Date Submitted	Last Update
0001194	X3D	19775-1 (Abstract)	public	2017-11-08 05:39	2020-06-12 20:03

Reporter walroy

Assigned To

Priority normal **Severity** minor **Reproducibility** N/A

Status acknowledged **Resolution** open

Summary 0001194: 23.4.4 NavigationInfo VIEWALL (or X3DViewpointNode viewAll) should be a required navigation behaviour

Description -- Submitter indicates that this comment may be public: *Yes* --

Comment on 19775-1: Abstract X3D Definitions - V3.3

23.4.4 NavigationInfo

<http://www.web3d.org/documents/specifications/19775-1/V3.3/Part01/components/navigation.html#NavigationInfo>

Subject: "VIEWALL" needs to be a required navigation behavior

A common failure mode for end users is to have no viewpoint, or incorrect viewpoints, inside a large X3D model. Such a situation means that there is no way to tell if the scene is empty, or the browser is broken, or what else might be going on.

This pathology is becoming more prevalent as CAD and 3D printing models are created more frequently, especially with varying units.

VIEWALL thus needs to be available as a navigation option (and also recovery mode) for users.

A number of X3D browsers have already implemented this functionality, which

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therefore appears to be well understood.

Suggest adding:

"VIEWALL" zooms back to show all geometry in a scene, either from the current location or from the default viewpoint location.

Additional Information Submitted on Thursday, 2017, November 2 - 9:52am
by brutzman (brutzman)
IP: 162.225.68.164

See: <http://www.web3d.org/node/1694/submission/1552>

Tags [V4.0](#) 

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- | | | | | |
|------------|-------------------------|------------------------------|--------------------------|--|
| related to | 0001305 | assigned | brutzman | add field to Viewpoint for dedicated NavigationInfo [Delete] |
| related to | 0001264 | acknowledged | | NavigationInfo type TURNTABLE HELICOPTER GAME FREEFLY [Delete] |
| related to | 0001301 | assigned | mmccann | check geospatial navigation to see if NavigationInfo modes are sufficient [Delete] |

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~0002193

walroy (manager)

2017-11-08 05:42

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Reply may be made public.

Isn't this more of a Viewpoint option than a NavigationInfo one? NavigationInfo specifies how a viewer moves in the scene (walk, examine, etc.), not where the viewer is looking from (camera position/orientation).

23.4.4 NavigationInfo: "The NavigationInfo node contains information describing the physical characteristics of the viewer's avatar and viewing model."

23.4.6 - Viewpoint: "The Viewpoint node defines a viewpoint that provides a perspective view of the scene."

Submitted by Leonard Daly on 2nd November 2017

http://web3d.org/mailman/private/x3d_web3d.org/2017-November/006496.html

~0002195

walroy (manager)

2017-11-16 05:34

Last edited: 2018-01-24

09:45

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Extract from minutes of X3D Mantis subgroup meeting held 13th November 2017

http://web3d.org/mailman/private/x3d_web3d.org/2017-November/006544.html

The discussion opened with a restatement of the intended behaviour. If a scene author allows NavigationInfo type "VIEWALL" or "ANY" then the X3D browser user is offered an option to "View All" on the X3D browser interface. On the other hand, If the scene author does not include "VIEWALL" or "ANY" then the "View All" option on the X3D browser interface would be inhibited. The scene author could desire this latter behaviour for privacy or user experience reasons.

When a user selects the "View All" option on the X3D browser, two candidate behaviours might be implemented: 1), The viewpoint moves along the vector from the current viewpoint to the centre of the scene, which might be in or out, in order to view the complete scene, or 2) the X3D browser somehow selects a new viewpoint. There might even be an option to do behaviour 1) on the first selection, and 2) on repeat selection. Both behaviours could be described in the prose. The action for behaviour 1) could be specified as a rotation of the viewpoint to the centre of the scene, followed by a zoom in or out as appropriate.

The use case of a scene author wanting to animate the "View All" behaviour was then considered. An X3D browser can always compute a centre, or a weighted centre of a scene. A scene author could include a separate NavigationInfo node with only the VIEWALL mode selected. On binding that node the "View All" animation would be animated.

It was noted that there would also be a need to consider timing issues with the "isBound" and "bindTime" output events, particularly when a change of viewpoint is being animated. However, it was also recognized that the "Jump" field of the Viewpoint node controls whether the change of viewpoint is instantaneous, or animated.

Remembering the comment submitted by Leonard that this might be considered to be a Viewpoint attribute rather than a NavigationInfo attribute, this alternative approach was considered next. For example, a

field could be added to the Viewpoint node called, "fit". This should still allow a scene author to permit, or disallow, the "View All" option as appropriate, by creating a separate Viewpoint with the "fit" field set to true. This Viewpoint, like all Viewpoint nodes, would be listed in the X3D browser interface, so selectable by the user.

A minor drawback of not having a "VIEWALL" type in the NavigationInfo node would mean that scene authors would always have to provide this option, rather than it being available by default provided that "ANY" type of navigation is permitted. Having VIEWALL available by default, unless the scene author chooses to inhibit it, automatically provides a recovery option for an X3D browser user having viewing difficulties.

~0002260

brutzman (developer)

2018-01-25 23:54

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Related:

X3D 19775 Abstract Spec, Annex G Recommended navigation behaviours (informative)

<http://www.web3d.org/documents/specifications/19775-1/V3.3/Part01/behaviours.html#SelectFromMultipleViewpoints>

"This annex describes basic X3D scene navigation recommended practice." and
"Features that imply interactivity are fundamental in X3D."

Of note: Annex G is not referred to by NavigationInfo section and likely should be.

Further discussion thread by X3D Working Group, needs to move to x3d-public forum:

[x3d] Thoughts on VIEWALL proposal - Mantis 1194 by Roy Walmsley
http://web3d.org/mailman/private/x3d_web3d.org/2018-January/006769.html

~0002261

brutzman (developer)

2018-01-28 17:49

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One example VIEWALL algorithm for X3D browser:

- compute bounding box and center for entire current scene.
- stay at current location, re-orient view to look at that center.
- move out (or in) along that vector until bounding box is within view frustum.
- (Dick's variation) if objects are very small, might need to move in further, or draw the bounding box, or something.

Not a goal: strictly specifying such an algorithm to allow compatible browser innovations, since different approaches might be appropriate depending on user/scene context.

Dialog moved to x3d-public mailing list for broader consideration and comment.

[x3d-public] supporting VIEWALL capabilities for users, authors, browsers - Mantis 1194

http://web3d.org/pipermail/x3d-public_web3d.org/2018-January/008215.html

~0002262

brutzman (developer)

2018-01-28 21:23

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[X3D working group teleconference 5 JUN 2020]

http://web3d.org/pipermail/x3d-public_web3d.org/2020-

~0002590

brutzman (developer)

2020-06-05 09:16

Last edited: 2020-06-12

19:45

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[June/012823.html](#)

VIEWALL is curious in comparison to other navigation modes in that it is a one-time action.

Perhaps this functionality is more appropriate as part of Viewpoint?

Perhaps this functionality is best implemented as a builtin Viewpoint, similar to default Viewpoint (at position 0 0 10). How might an author bind and unbind this?

Perhaps there might be a ViewAll node, which an author can bind via Browser object or similar mechanisms. Perhaps even multiple nodes, each zooming back from center of scene along orientation (or axis?) of interest:

```
<ViewAll description="North side of island" orientation="0 1 0 0"/>
<ViewAll description="South side of island" orientation="0 1 0 3.14159"/>
```

Note that we would need this capability in OrthoViewpoint as well.

From 3.3 spec:

<https://www.web3d.org/documents/specifications/19775-1/V3.3/Part01/components/navigation.html#Viewpoint>

23.4.6 Viewpoint

```
Viewpoint : X3DViewpointNode {
  SFBool [in] set_bind
  SFVec3f [in,out] centerOfRotation 0 0 0 (-?,?)
  SFString [in,out] description ""
  SFFloat [in,out] fieldOfView ?/4 (0,?)
  SFBool [in,out] jump TRUE
  SFNode [in,out] metadata NULL [X3DMetadataObject]
  SFRotation [in,out] orientation 0 0 1 0 [-1,1],(-?,?)
  SFVec3f [in,out] position 0 0 10 (-?,?)
  SFBool [in,out] retainUserOffsets FALSE
  SFTime [out] bindTime
  SFBool [out] isBound
}
```

Possible addition:

```
SFString [in,out] scope "" [as defined, or "VIEWALL"]
```

Functionality is to zoom position back/in towards center of world's bounding box until everything is within display bounds.

What about:

```
SFBool [in out] viewAll FALSE
```

Same functionality to zoom position back/in. For non-orthographic Viewpoint, orientation changes to point at center of scene; OrthoViewpoint orientation remains unchanged. Other fields remain the same.

Proposal:

```
SFBool [in out] viewAll FALSE
```

~0002595

brutzman (developer)

2020-06-06 15:57

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"When viewAll is set TRUE or a viewpoint is bound with viewAll TRUE, the current view is modified to change centerOfRotation to match center of bounding box for entire visible scene, change orientation to aim at that point, change type to EXAMINE, and then zooms position in or out until the scene is fully within the current viewing window. Changing navigation type resets viewAll to FALSE."

~0002598

brutzman (developer)

2020-06-09 09:26

Last edited: 2020-06-09

10:03

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Email threaded discussion on use of viewAll in a large autogenerated scene:

* [x3d-public] file converter based on pythonocc; Viewpoint viewAll
http://web3d.org/pipermail/x3d-public_web3d.org/2020-June/012891.html

Use-case example:

```
<Viewpoint viewAll="true" description="show me whatcha got"/>
```

Note that the response of each viewpoint node type is not exactly identical.

X3DViewpointNode might list the field with a simple explanation, noting that each implementing viewpoint node must fully specify behavior.

Of note for OrthoViewpoint is that, while outside of the model, zooming position in towards center of rotation has no effect. Primarily the fieldOfView gets modified.

<https://www.web3d.org/documents/specifications/19775-1/V3.3/Part01/components/navigation.html#OrthoViewpoint>

a. X3DViewpointNode: "When viewAll is set TRUE or a viewpoint is bound with viewAll TRUE, the current view is modified to change centerOfRotation to match center of bounding box for entire visible scene, change orientation to aim at that point, change type to EXAMINE. Each type of viewpoint takes an additional action to place the entirety of the scene within the user's displayable view. If the current view is within any model, any intervening geometry does not block the change in position. No collision detection or proximity sensing occurs when zooming outwards. Changing navigation type resets viewAll to FALSE."

b. Viewpoint: copy the X3DViewpoint prose, and insert sentence "Then zoom position in or out until the entire scene is fully within the current viewing window."

c. OrthoViewpoint: first copy the X3DViewpoint prose, and insert sentences "If within the model, zoom out until outside the model. Then fieldOfView is modified to encompass the visibility of all geometry in the bounding box for the entire model."

~0002601

brutzman (developer)

2020-06-12 09:30

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Preliminary feedback: look closely at whether NavigationInfo type is modified to EXAMINE or not as part of this behavior.

From Michalis, preliminary:

"- viewAll=true should only affect position/orientation of the camera (and not navigation)
- navigationInfo should of course allow to affect any navigation parameter
So author can use both viewAll=true, and
navigationInfo=SomethingNonNull at the same time."

Need to be careful that we not interfering with the separate NavigationInfo binding stack in ways that cause unintended side effects.

Updated email sent to community, further consideration needed.

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Date Modified	Username	Field	Change
2017-11-08 05:39	walroy	New Issue	
2017-11-08 05:42	walroy	Note Added: 0002193	
2017-11-13 11:39	walroy	Status	new => acknowledged
2017-11-16 05:34	walroy	Note Added: 0002195	
2018-01-24 09:45	brutzman	Note Edited: 0002195	View Revisions
2018-01-25 23:54	brutzman	Note Added: 0002260	
2018-01-28 17:49	brutzman	Note Added: 0002261	
2018-01-28 17:51	brutzman	Description Updated	View Revisions
2018-01-28 21:23	brutzman	Note Added: 0002262	
2019-11-01 03:05	brutzman	Tag Attached: V4.0	
2020-05-27 10:52	brutzman	Relationship added	related to 0001264
2020-06-05 08:58	brutzman	Relationship added	related to 0001301

Issue History

Date Modified	Username	Field	Change
2020-06-05 09:16	brutzman	Note Added: 0002590	
2020-06-05 09:21	brutzman	Note Edited: 0002590	View Revisions
2020-06-05 09:23	brutzman	Note Edited: 0002590	View Revisions
2020-06-06 15:21	brutzman	Note Edited: 0002590	View Revisions
2020-06-06 15:57	brutzman	Note Added: 0002595	
2020-06-09 06:56	brutzman	Summary	23.4.4 NavigationInfo - VIEWALL should be a required navigation behaviour => 23.4.4 NavigationInfo VIEWALL (or Viewpoint viewAll) should be a required navigation behaviour
2020-06-09 09:26	brutzman	Note Added: 0002598	
2020-06-09 09:30	brutzman	Note Edited: 0002598	View Revisions
2020-06-09 09:31	brutzman	Note Edited: 0002590	View Revisions
2020-06-09 09:34	brutzman	Note Edited: 0002598	View Revisions
2020-06-09 09:39	brutzman	Note Edited: 0002598	View Revisions
2020-06-09 09:41	brutzman	Note Edited: 0002598	View Revisions
2020-06-09 09:44	brutzman	Note Edited: 0002598	View Revisions
2020-06-09 09:48	brutzman	Note Edited: 0002598	View Revisions
2020-06-09 09:49	brutzman	Note Edited: 0002598	View Revisions
2020-06-09 09:52	brutzman	Note Edited: 0002598	View Revisions
2020-06-09 10:03	brutzman	Note Edited: 0002598	View Revisions
2020-06-11 11:25	brutzman	Summary	23.4.4 NavigationInfo VIEWALL (or Viewpoint viewAll) should be a required navigation behaviour => 23.4.4 NavigationInfo VIEWALL (or X3DViewpointNode viewAll) should be a required navigation behaviour
2020-06-12 09:30	brutzman	Note Added: 0002601	
2020-06-12 19:45	brutzman	Note Edited: 0002590	View Revisions
2020-06-12 20:03	brutzman	Relationship added	related to 0001305