VRML to X3D

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TUT

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Introduction

- Why this topic ?

VRML

- VMRL – Virtual Reality Markup/Modeling Language
- For describing multi-participant interactive simulations (virtual worlds)

History of VRML

- Conceived 1994, WWW-conference Geneva
- 'attendees described projects already underway to build three dimensional graphical visualization tools which inter-operate with the Web. Attendees agreed on the need for these tools to have a common language for specifying 3D world description and WWW hyper-links -- an analog of HTML for virtual reality. '
- VRML 1.0, 1995
- VRML 2.0, 1996
  - With support for animations and interaction
- VRML 97, 1997, iso standardized

History of VRML

- Users disappointed on lack of compatibility on VRML 1.0
  - Browsers and viewers
  - Due to slowness of developing VRML 2.0 and lack of documentation
- Developers made their own add-ons and features on VRML 1.0
  - > increased incompatibility issues

VRML-file

- Textual representation of virtual environment

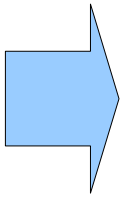
```
#VRML V2.0 utf8
Shape {
appearance Appearance {
material Material {
diffuseColor 1.0 0.0 0.0
ambientIntensity 0.2
shininess 0.2
}
}
geometry Box{}
}
```

VRML to X3D

- Differences between VRML and X3D
- X3D has replaced VRML
  - X3D ≈ VRML 3.0
- Tools for converting VRML to X3D
  - http://doc.instantreality.org/tools/x3d_encoding_converter/

Example

```
#VRML V2.0 utf8
Shape {
appearance Appearance {
material Material {
diffuseColor 1.0 0.0 0.0
ambientIntensity 0.2
shininess 0.2
}
}
geometry Box{}
}
```



```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE X3D PUBLIC "ISO//Web3D//DTD X3D 3.0//EN" "http:
<X3D xmlns:xsd='http://www.w3.org/2001/XMLSchema-instance
  <Scene DEF='scene'>
    <Shape>
      <Appearance>
        <Material diffuseColor='1 0 0'/>
      </Appearance>
      <Box/>
    </Shape>
  </Scene>
</X3D>
```

Advanced example

Benefits of X3D over VRML

- Advanced texture handling
- Structured representation

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE X3D PUBLIC "ISO//Web3D//DTD X3D 3.0//EN" "http://www.web3d.org/specifications/x3d-3.0.dtd">
<X3D xmlns:xsd='http://www.w3.org/2001/XMLSchema-instance' profile='Full' version='3.0' xsd:noNamespaceS
  <Scene DEF='scene'>
    <Shape>
      <Appearance>
        <Material diffuseColor='1 0 0'/>
      </Appearance>
      <Box/>
    </Shape>
  </Scene>
</X3D>
```

Benefits of X3D over VRML

- VRML compatible
  - X3D has 'classic VRML' encoding, can play most VRML 2.0 non-scripted worlds with minor changes
- XML encoding to integrate smoothly with other applications
- X3D scenes and environments operate predictably between different players/browsers
- X3D is more feature rich
  - Has a lot of features requested in VRML 2.0
- X3D is continually being enhanced and updated
- http://argency.eu/subdomains/blog/blog_html_code/?p=325

Summary

- Conversion works from VRML 2.0 / 97 to X3D
  - And the results usually too
- VRML 1.0 out dated and shouldn't be used
- Use X3D if possible

References and additional info

- http://www.web3d.org/x3d/specifications/vrml/VRML1.0/index
- http://www.wiley.com/legacy/compbooks/vrml2sbk/toc/toc.htm
- https://publications.theseus.fi/bitstream/handle/10024/11868/
- http://www.web3d.org/x3d/specifications/vrml/ISO-IEC-14772
- http://cic.nist.gov/vrml/vbdetect.html