Mobile Web3D Standardization Updates

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### Component support

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• Comments on the X3D interactive profile
  • It is necessary to check support levels and minimum browser support
details included in the X3D interactive profile
  • Some restrictions may not be necessary
    • Color (15,000 colors), ImageTexture (JPEG and PNG), etc.
• Recommendation
  • The interactive profile and the described restrictions may not be
necessary as performance of mobile devices improves and approaches
that of desktop computers
  • Instead of the interactive profile, describing recommendations for
lightweight devices inside the X3D specification would be enough
Mobile Web3D Standardization

• Mobile 3D Functions
  – A progressive mesh supporting functions for mobile 3D
  – GPS functions for mobile 3D
Progressive Meshes

• Hugues Hoppe, SIGGRAPH 96

• Algorithm
  • Reduce the number of polygons and vertices
  • Transform and transfer the original data to a base mesh and refinements
  • Recover the original data from the base mesh and refinements
Progressive Meshes

Ant.x3d
Polygon : 2624
Vertex : 1374

Bong-Su-Dang.x3d
Polygon: 1080
Vertex: 1414

Face.x3d
Polygon : 9651
Vertex : 5000
Progressive Meshes

- Polygon: 2624
  Vertex: 1374

- Polygon: 1250
  Vertex: 687

- Polygon: 574
  Vertex: 343
Progressive Meshes (Video)

Polygon: 2624  
Vertex: 1374

Polygon: 1250  
Vertex: 687

Polygon: 574  
Vertex: 343
Progressive Mesh Generator

Before Progressive Mesh Algorithm

Progressive Mesh Input Window

Progressive Mesh Information Window

After Progressive Mesh Algorithm

2011-8-11 Web3D Korea
Progressive Mesh Generator (Video)
Progressive Mesh Mobile X3D Viewer

- **Objective**
  - Represent 3D objects reduced variably by the progressive mesh algorithm based on the resolution of the mobile device

- **Implementation procedure**
  1. X3D file open
  2. Determine the use of progressive meshes according to the model’s vertices
  3. The mobile viewer recognizes the type and resolution of the device
  4. Apply progressive mesh algorithm and convert the vertices
  5. Display the converted progressive mesh model
Progressive Mesh Mobile
GPS Functions

• Spatial Synchronization
  – 3D scene
  – GPS

• Implementation of GPS
Mobile X3D Viewer (Android)
Mobile X3D and GPS (Android)

Miller’s Map Projection
Conclusions

• Comments on the X3D Interactive Profile
  – Restrictions may not be necessary
• Mobile Web3D standardization
  – Progressive mesh data
  – GPS function
    • NMEA protocol
    • Miller’s map projection
  – Scalable 3D streaming
• Implementation of mobile X3D viewers