
Mobile Web3D Standardization Updates

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X3D Interactive Profile (1)

Component support

Component	
Core	Texturing
Time	Interpolation
Networking	Pointing device sensor
Grouping	Key device sensor
Rendering	Environmental sensor
Shape	Navigation
Geometry3D	Environmental effects
Lighting	Event utilities

X3D Interactive Profile (2)

- 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



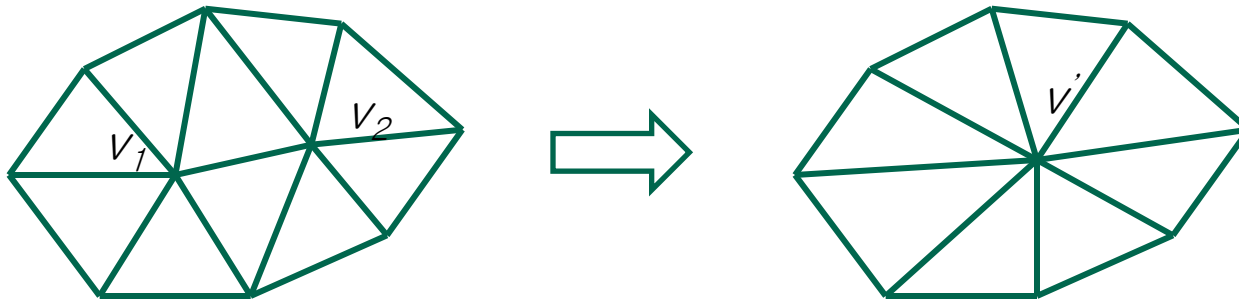
Polygon: 101432 → 17567



Polygon: 70000 → 50000 → 30000

Progressive Meshes

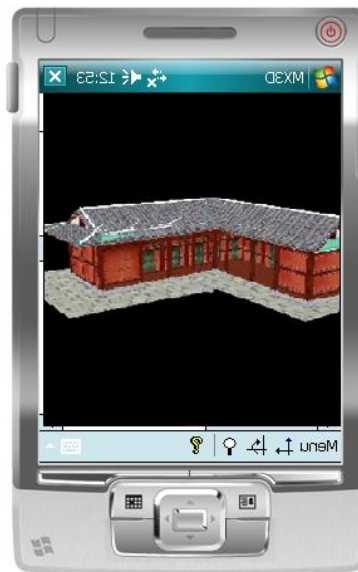
- Hugues Hoppe, SIGGRAPH 96
- Algorithm
 - Reduce the number of polygons and vertices
 - Transform and transfer the original data to a base mesh and refinements
 - Recover the original data from the base mesh and refinements



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

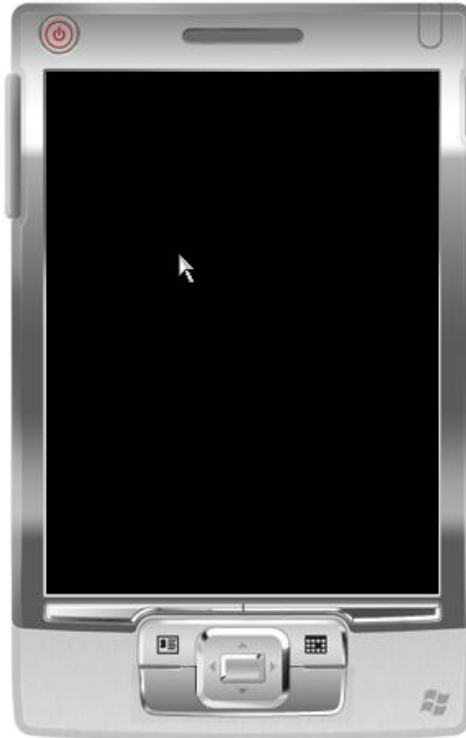


Polygon: 574
Vertex: 343

Progressive Meshes (Video)



Polygon: 2624
Vertex: 1374



Polygon: 1250
Vertex: 687

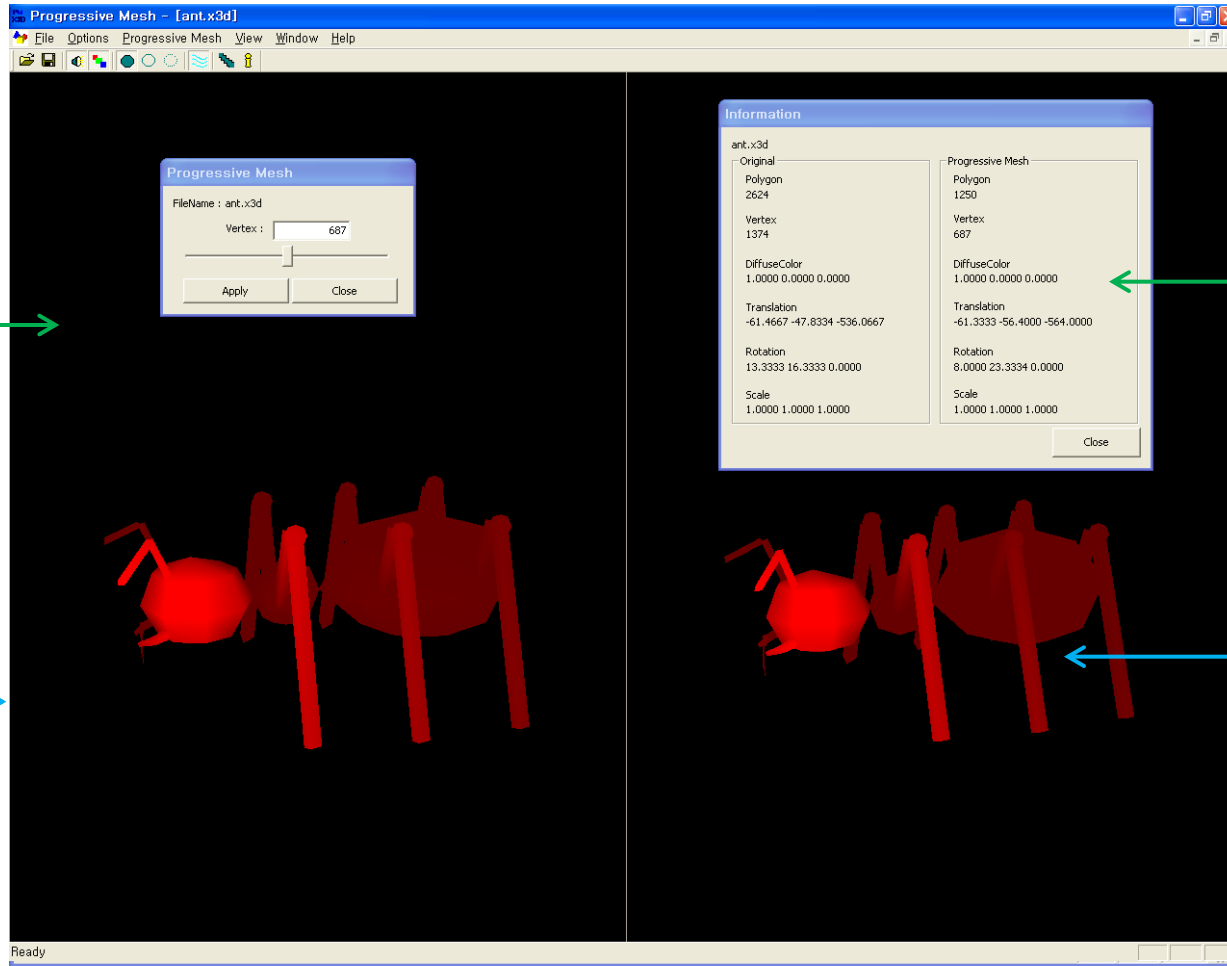


Polygon: 574
Vertex: 343

Progressive Mesh Generator

Progressive Mesh
Input
Window

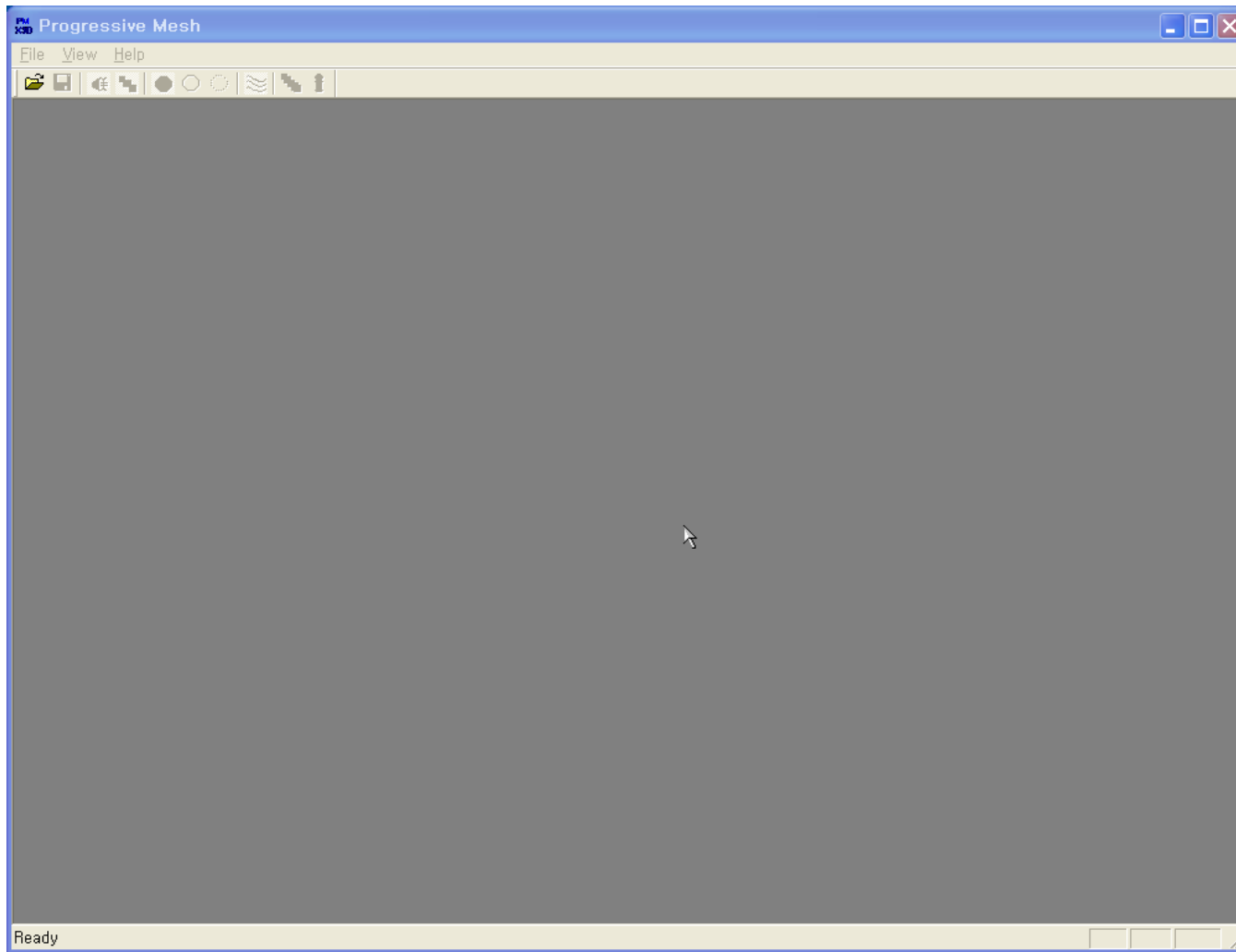
Before
Progressive Mesh
Algorithm



Progressive Mesh
Information
Window

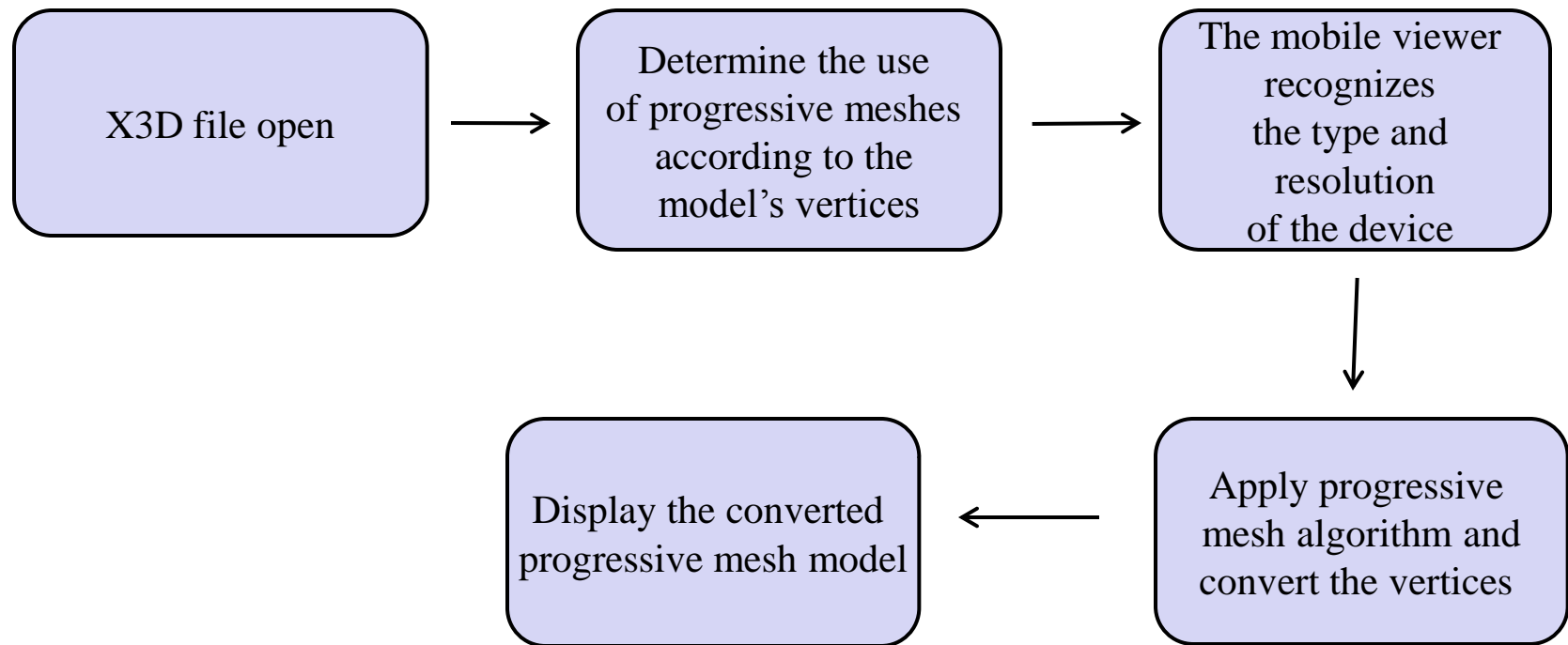
After
Progressive Mesh
Algorithm

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



Progressive Mesh Mobile

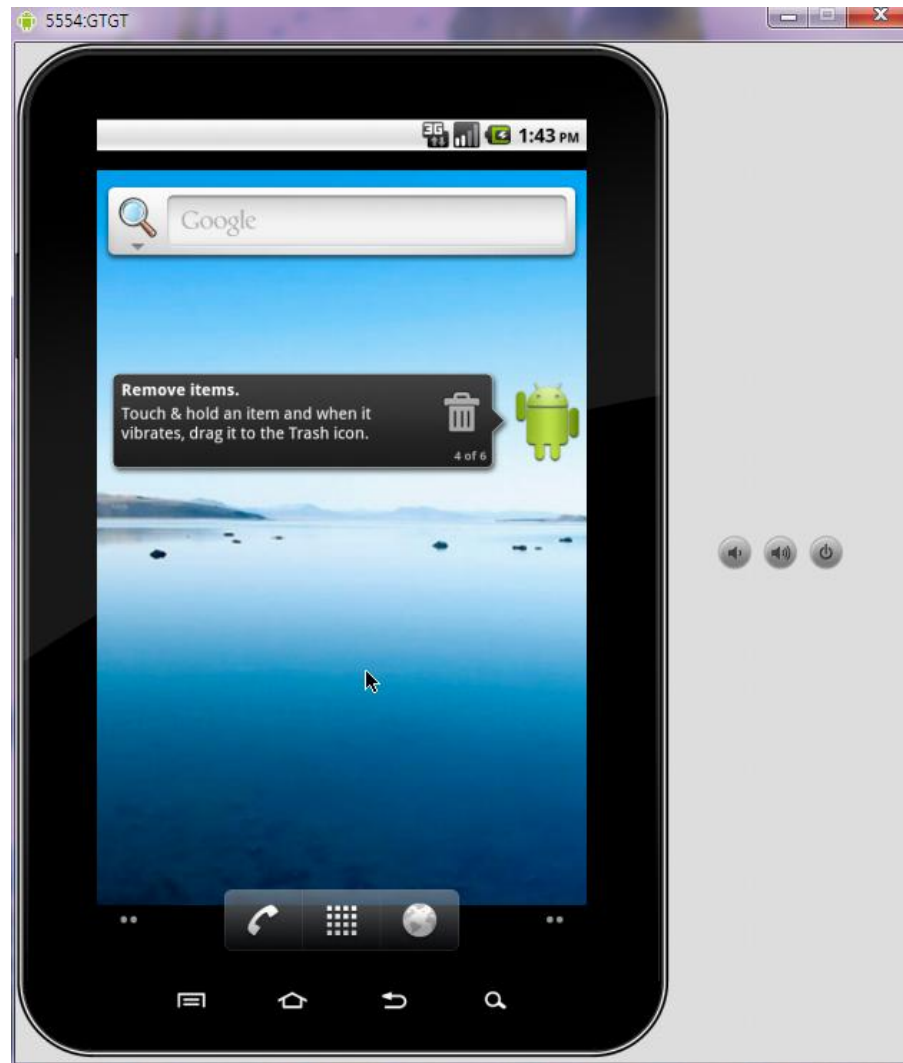


GPS Functions

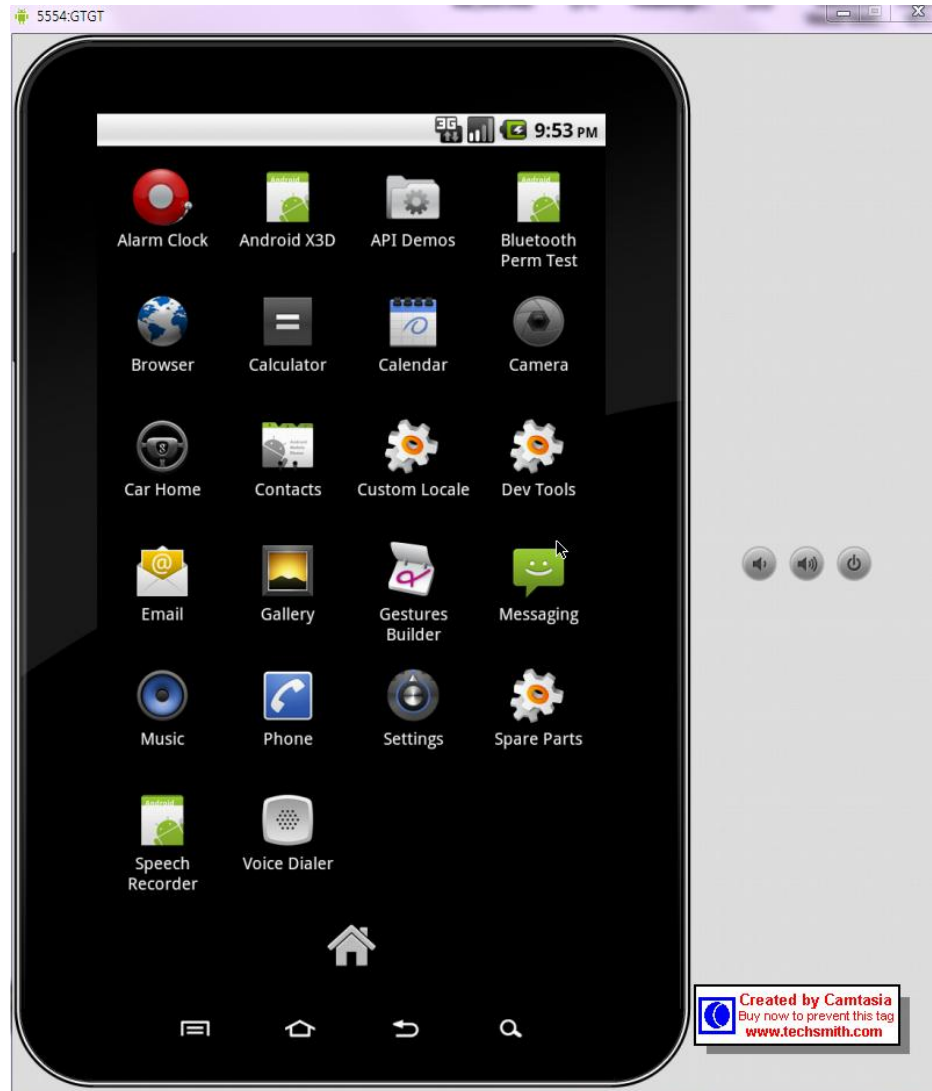
- Spatial Synchronization
 - 3D scene
 - GPS
- Implementation of GPS



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