

*3D Scanning: Use Cases,
Workflow and Profile
Requirements for X3D*

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3D Scanning: Use Cases, Workflow and Profile Requirements for X3D

- 3D scanning is growing in importance!
- Typical workflows exist both for scan refinement and scan applications, but numerous variations create difficulties that might be well served by a common data format and shared metadata conventions using X3D.
- Common profile might serve X3D CAD, 3D Printing and 3D Scanning

Topics

- 3D Scanning exemplar : Hamming brick
- 3D Scanning exemplar: VR Hackathon Virtual Banana
- ISO STEP briefing, Christophe Mouton
- ISO JTC-1 Study Group Report: 3D Printing + Scanning

X3D Scanning examples archive



X3D Example Archives: X3D for Advanced Modeling, Scanning








This chapter explores the use of [3D scanners](#) to produce X3D models.

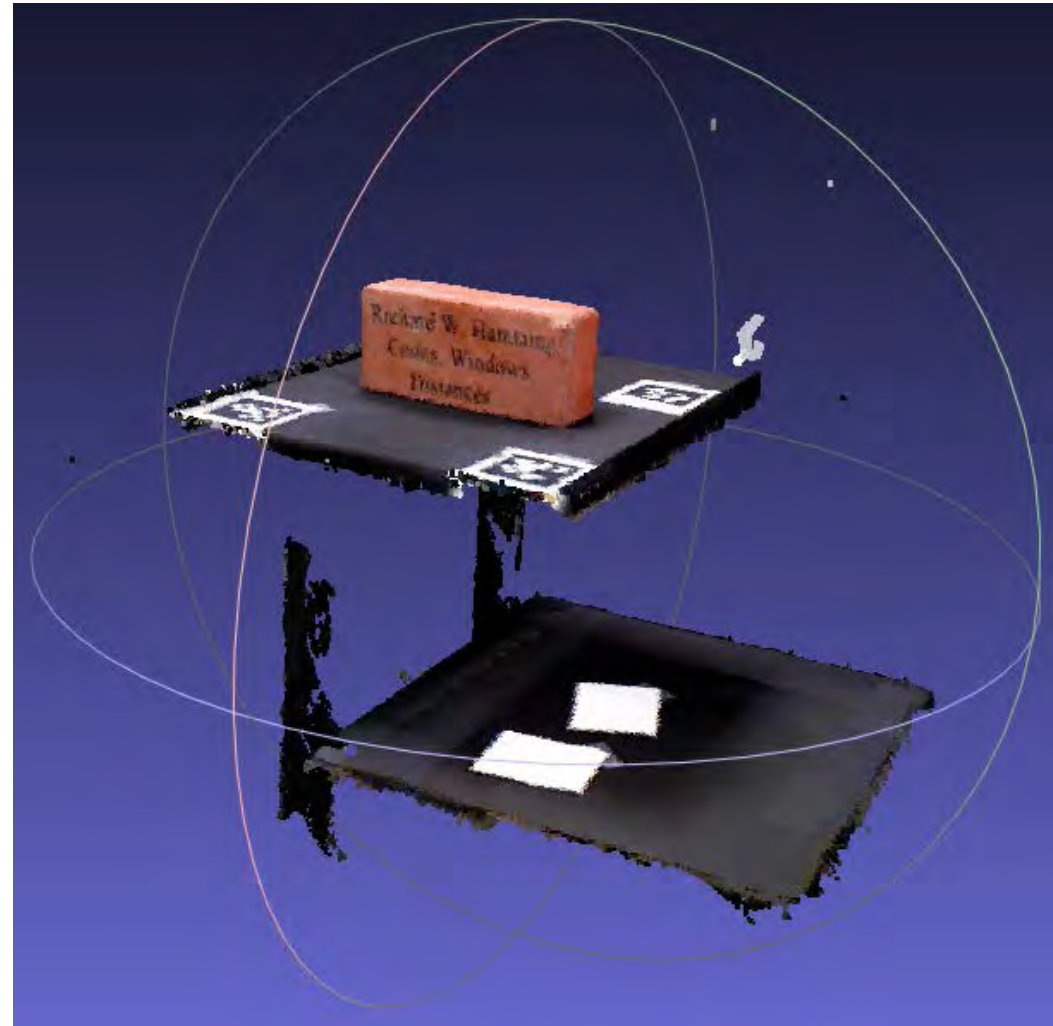
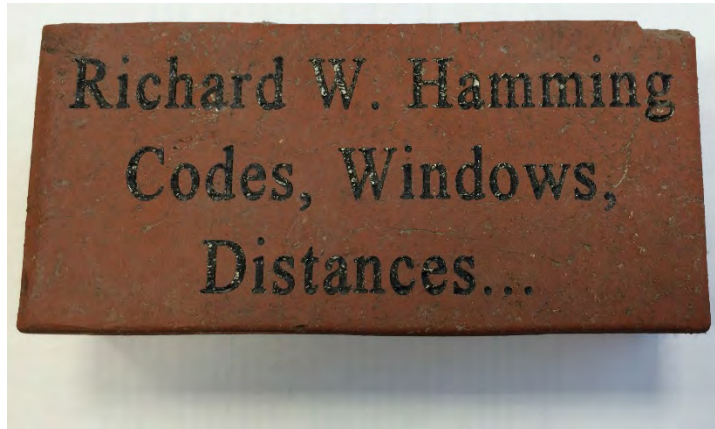
On 22 July 2016, the [Web3D Consortium CAD Working Group](#) held our initial workshop at the [Web3D 2016 Conference](#). Participants explored how to achieve a combined X3D Profile for CAD, 3D Printing and 3D Scanning. Much coordinated work has occurred since then.

We are now preparing for the next workshop as part of the [Web3D 2017 Conference](#) on 2-7 June 2017 in Brisbane Australia.



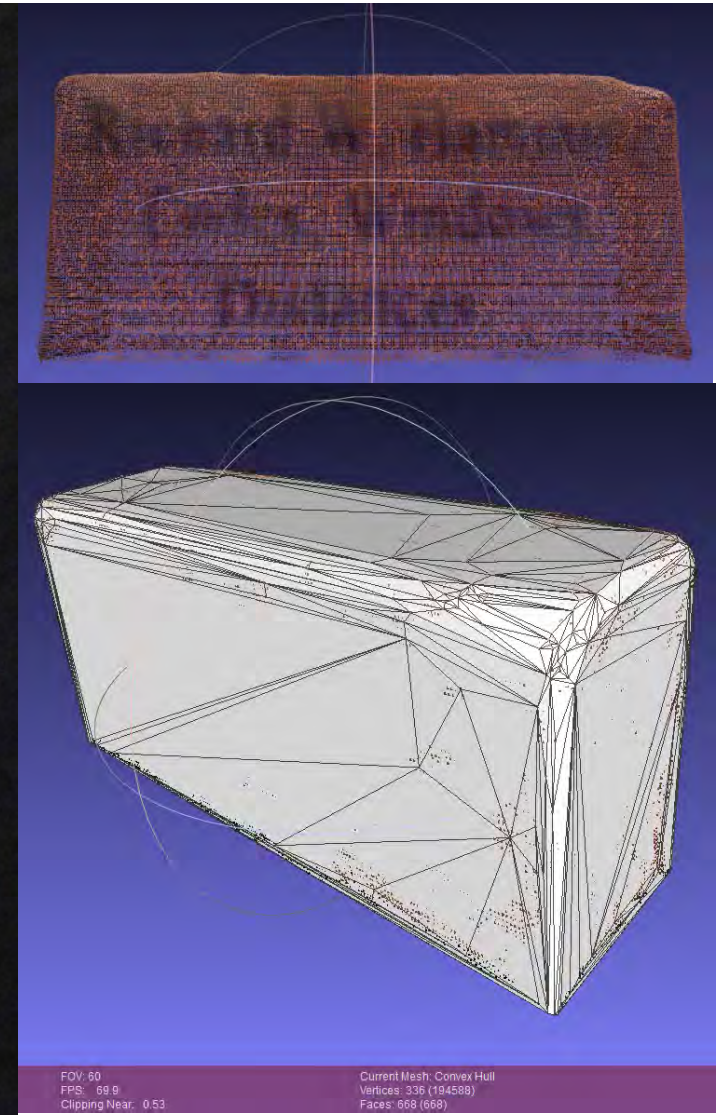
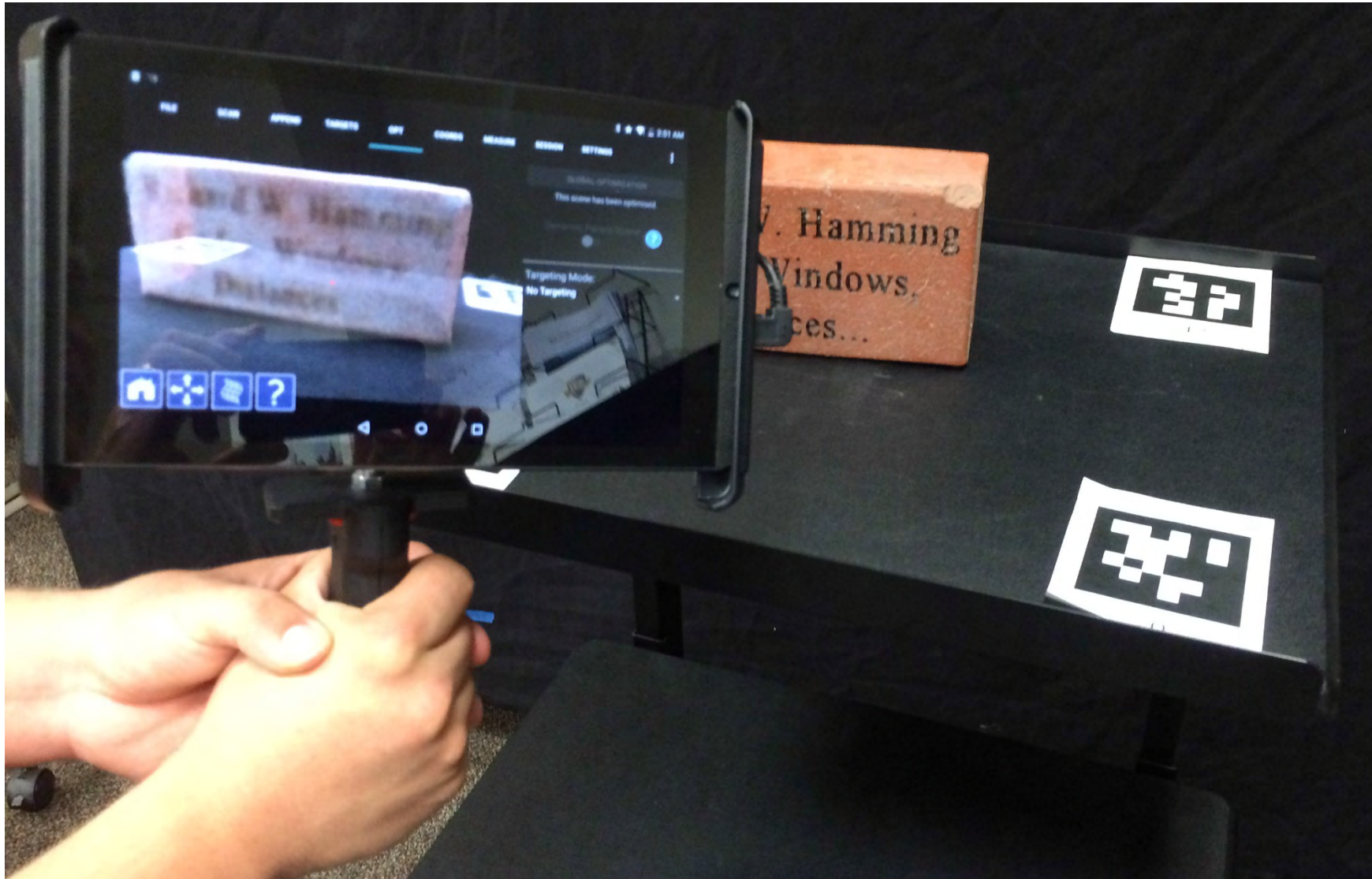
5 X3D Scenes		Scene Descriptions
	Hamming Brick Poisson Mesh	3D scan of Hamming brick: mesh produced by DotProduct scanner, converted to X3D using Meshlab, and tuned for publication using X3D-Edit.
	Virtual Banana Original	Original Cyber Banana model by Mark Pesce and Tony Parisi, SIGGRAPH 1994, used for proposing the Virtual Reality Markup Language (VRML).
	Virtual Banana Reduced	Banana scanned at VR Hackathon, Web3D 2017, Brisbane Australia with point cloud reduced by Meshlab using Filters, PointSet, Point Cloud Simplification.
	Virtual Banana Scanned	Banana scanned at VR Hackathon, Web3D 2017, Brisbane Australia with point cloud reduced by Meshlab using Filters, PointSet, Point Cloud Simplification.
	X3D Mesh Design Pattern	Candidate design pattern for 3D scanner outputs to consistently define the elements of an X3D mesh.

3D Scanning exemplar: Hamming brick



3D Scanning exemplar: Hamming brick

2



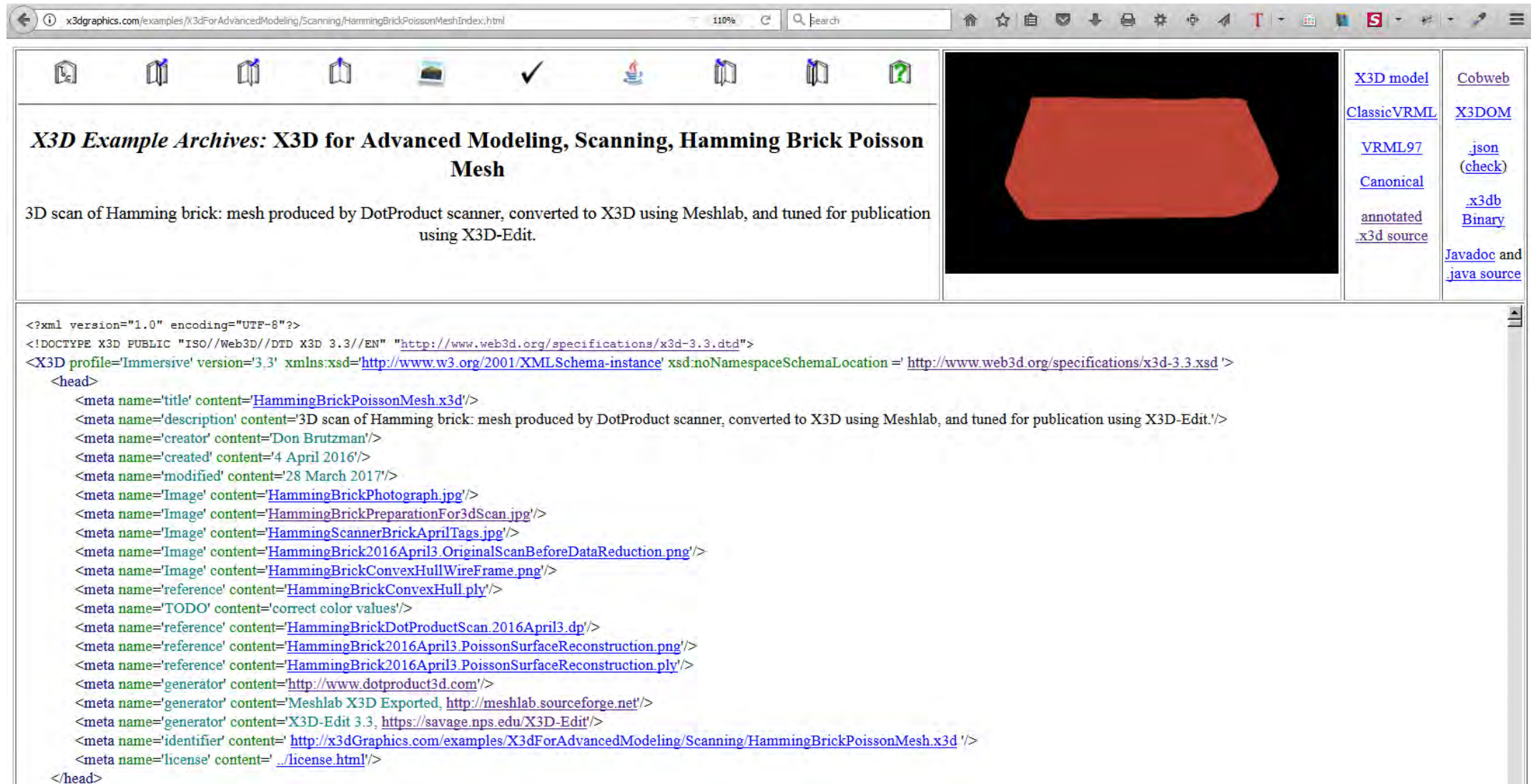
VR Hackathon Project: Virtual Banana



VirtualBananaScanning2017June3.mov

3D Scanning exemplar: Hamming brick

3



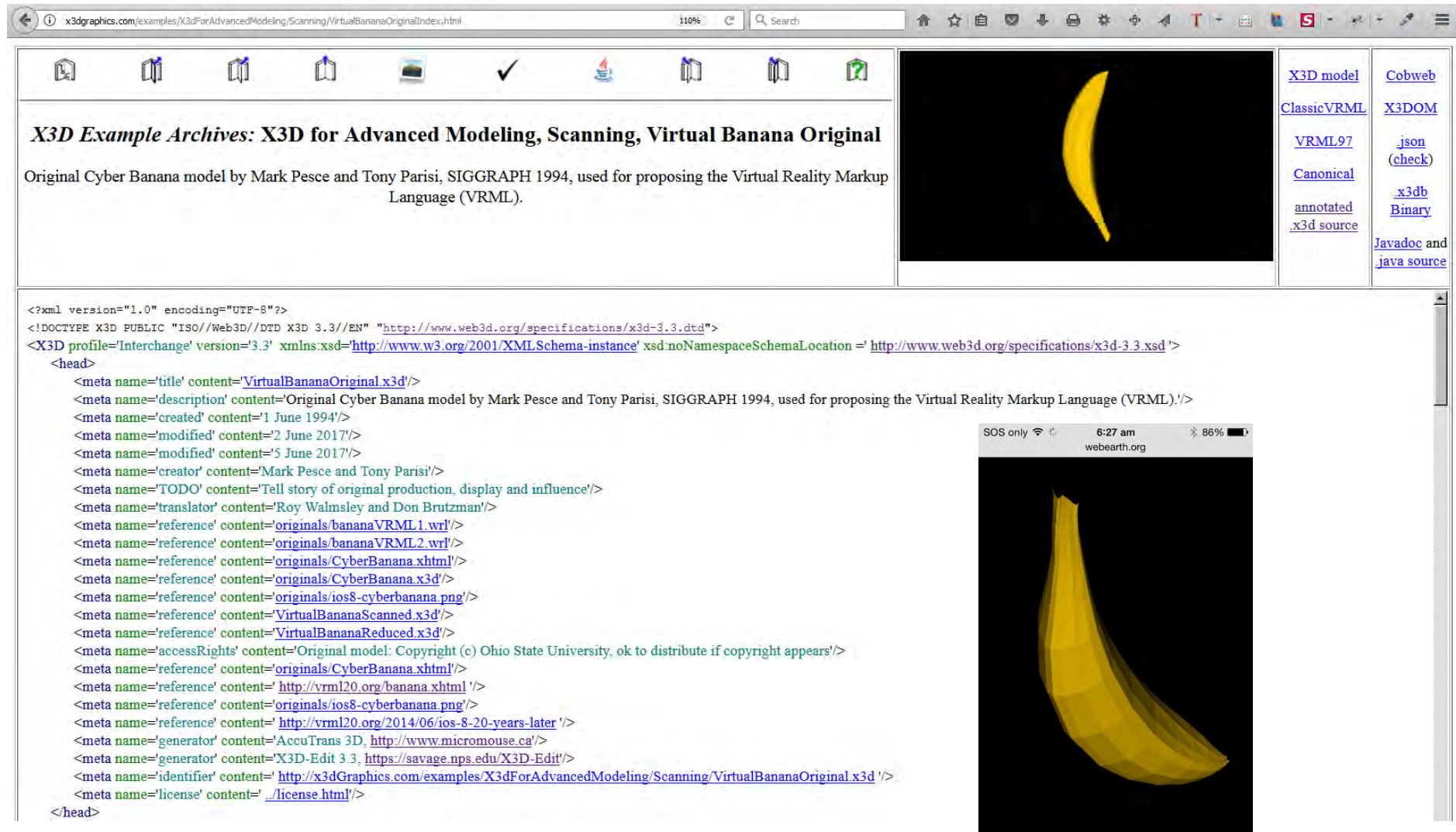
X3D Example Archives: X3D for Advanced Modeling, Scanning, Hamming Brick Poisson Mesh

3D scan of Hamming brick: mesh produced by DotProduct scanner, converted to X3D using Meshlab, and tuned for publication using X3D-Edit.

[X3D model](#) [Cobweb](#)
[ClassicVRML](#) [X3DOM](#)
[VRML97](#) [.json \(check\)](#)
[Canonical](#) [.x3db Binary](#)
[annotated .x3d source](#) [Javadoc and java source](#)


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    <meta name='license' content='../license.html'/>
  </head>
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Cyberbanana original




X3D Example Archives: X3D for Advanced Modeling, Scanning, Virtual Banana Original

Original Cyber Banana model by Mark Pesce and Tony Parisi, SIGGRAPH 1994, used for proposing the Virtual Reality Markup Language (VRML).



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- [.x3db](#)
- [annotated](#)
- [.x3d source](#)
- [Binary](#)
- [Javadoc and java source](#)


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<?xml version="1.0" encoding="UTF-8"?>
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    <meta name="license" content="..license.html"/>
  </head>
```



Virtual Banana scanned, not optimized

X3D Example Archives: X3D for Advanced Modeling, Scanning, Virtual Banana Scanned

Banana scanned at VR Hackathon, Web3D 2017, Brisbane Australia with point cloud reduced by Meshlab using Filters, PointSet, Point Cloud Simplification.



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[Canonical](#) [.x3db](#)

[annotated](#) [Binary](#)

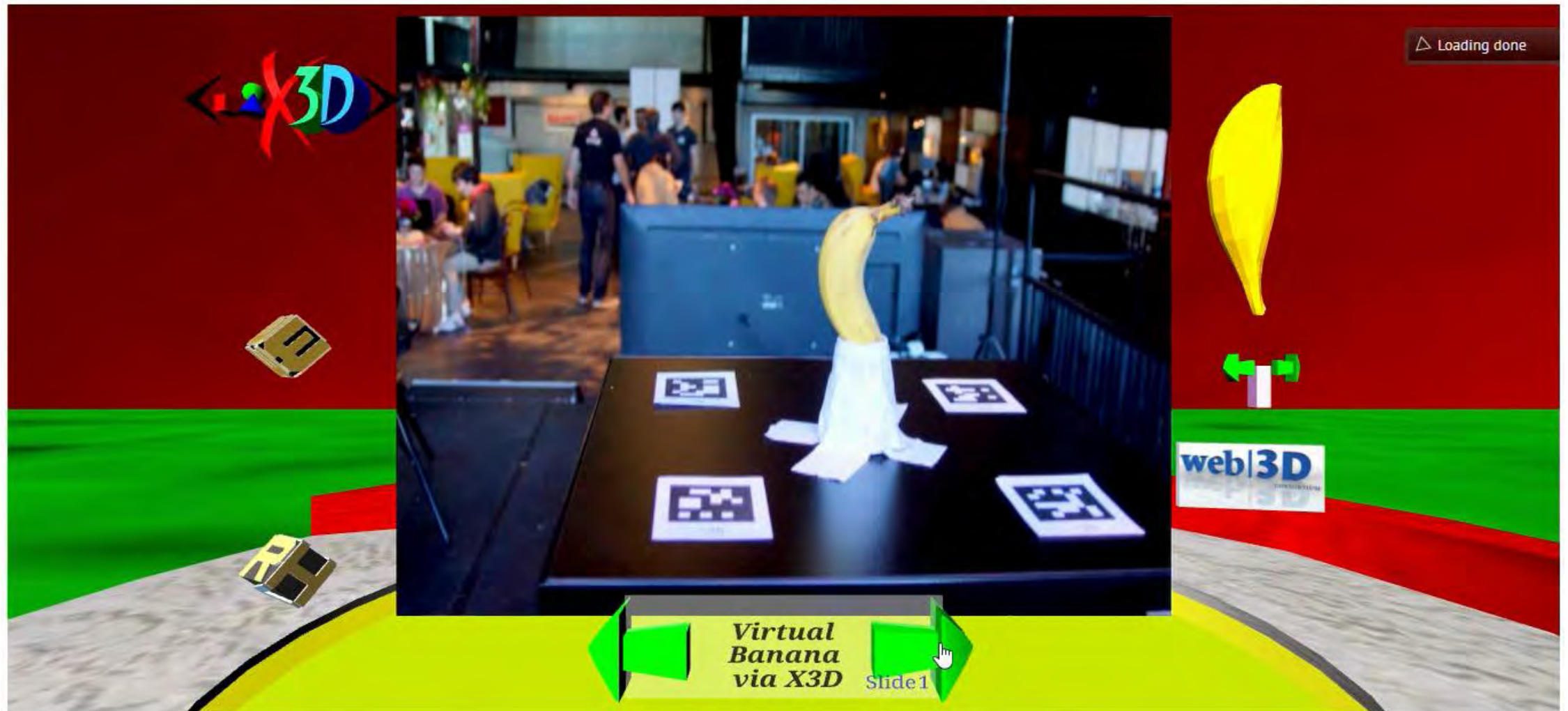
[.x3d source](#) [Javadoc and java source](#)

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<?xml version="1.0" encoding="UTF-8"?>
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<X3D profile="Immersive" version="3.3" xmlns:xsd="http://www.w3.org/2001/XMLSchema-instance" xsd:noNamespaceSchemaLocation="http://www.web3d.org/specifications/x3d-3.3.xsd">
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    <meta name="license" content="./license.html"/>
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        </Shape>
      </Transform>
    </Transform>
  </Scene>
</X3D>
```

Virtual Banana Scanned versus Reduced (still tuning Meshlab settings!)



VR Hackathon Presentation: Virtual Banana



Liaison efforts



JTC 1
Information
Technology

web|3D
CONSORTIUM

ISO/IEC JTC 1/SC 24 & Web3D Consortium liaison report

Christophe Mouton, EDF, ISO/IEC JTC 1/SC 24 liaison officer

Sandvika, 73d ISO/TC 184/SC 4 opening plenary, May 2016

ISO JTC-1 Study Group: 3D Printing + 3D Scanning

Technology Trend Report on 3D Printing and Scanning

September 30, 2016

ISO/IEC JTC 1 Plenary (November 2016, Lillehammer, Norway)

X3D 3D Printing and Scanning Requirements

Link to [X3D workflow diagrams](#)

Link to [X3D Specification features](#)

Contact

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- Vince Marchetti vmarchetti@ameritech.net