

## Panorama, 3D modeling, and Tourism

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## Today's Goal

We look at 3D data modeling of the real world and its application services, especially in tourism domain, which gradually become popular these days



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## Do you know this device?



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## An example photo taken by RICOH Theta



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## An example photo taken by OH Th



## Devices for Panorama Photos



GIGAPAN



Panono



RICOH THETA



Google Photo Sphere

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## World-famous panorama service:



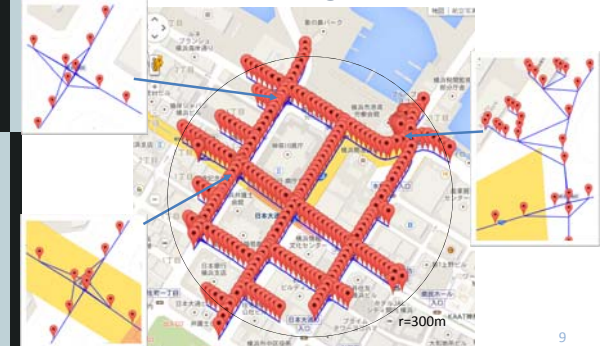
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<https://www.google.com/maps/zoom/streetview>

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## Distribution of Photo-Shooting Locations of Google Street View



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## How Street Views are Taken



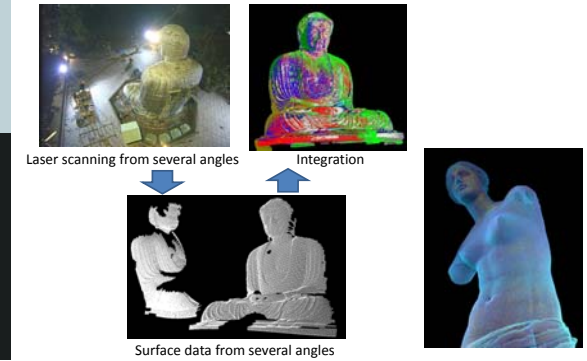
How different are they from ordinary panorama cameras?

## Proof that Street View camera measures distance to objects

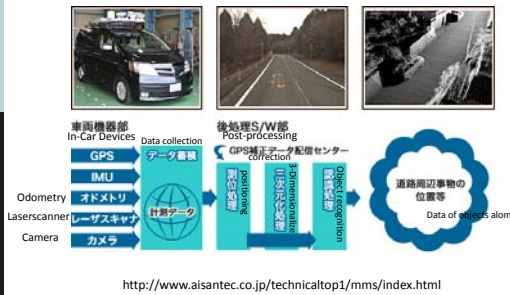


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## 3D Laser Scanning



## Mobile Mapping System (MMS)



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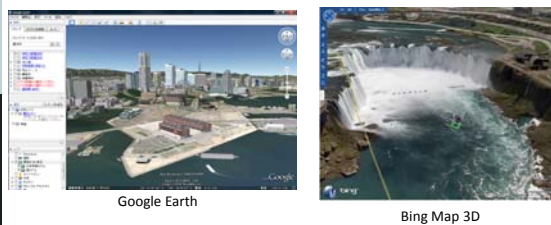


What kind of services we can make with panorama & 3D modeling technologies?



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## Virtual Globe Viewer

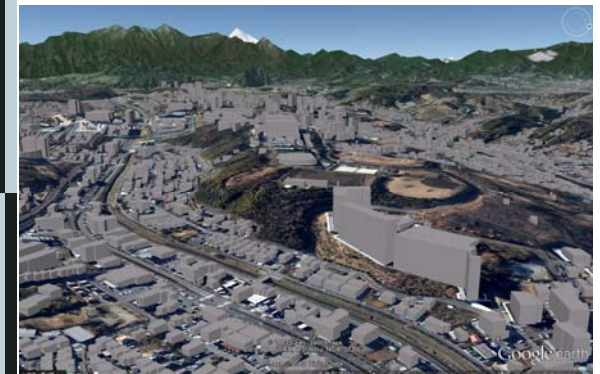


Bing Map 3D

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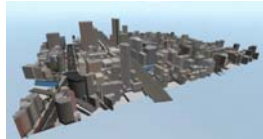
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## Computer Games



Flight Simulator  
in Google Earth



"Japanese Otaku City" by Zenrin

## Digital Archiving



<http://www.toppan-vr.jp/bunka/da/>



Where is this data used?

## Virtual Restoration of Historical Views



©ikuchi Lab., Univ. of Tokyo and CAD center  
<http://www.iis.u-tokyo.ac.jp/topics/daibutu/daibutsu-press.htm>

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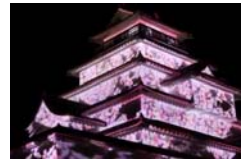
## Virtual Restoration of Historical Views



©Dept. of Geography, Ritsumeikan Univ.  
<http://www.geo.it.ritsumei.ac.jp/webgis/ritscoe.html>

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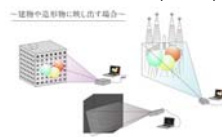
## Projection Mapping



Tsuruga-jo Castle, Fukushima



Tokyo Disneyland "Once Upon a Time"



<http://www.shipsmag.jp/2012winter/article.php?no=17>

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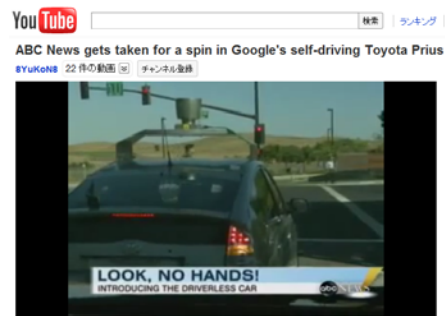
## Image Archives on Street View Service



<http://www.youtube.com/watch?v=VSQ9-6e2T28>

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## Self-Driving Car



<http://www.youtube.com/watch?v=Atmk07Otu9U>

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## Data Collecting in the Next Generation



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## We can post our panorama photos to Google Street View

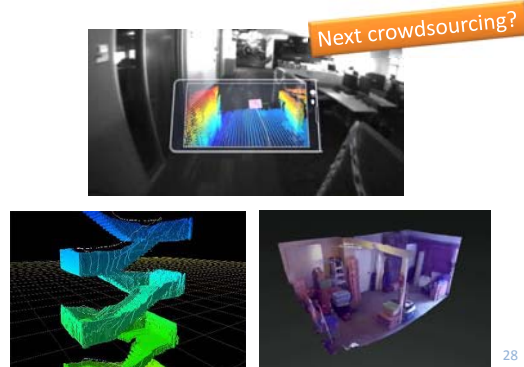


コンステレーション

Crowdsourcing

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## Google's Project Tango



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## Use of Drones



## Street View and Tourism



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## Street View for Tourism Promotion

- JTB (Japan Tourist Bureau) started a web site which introduces famous tourist destinations in Google Street View for promotion in 2012
- Japan Tourism Agency started to lease Google Street View Trekkers to six tourism destinations in 2014



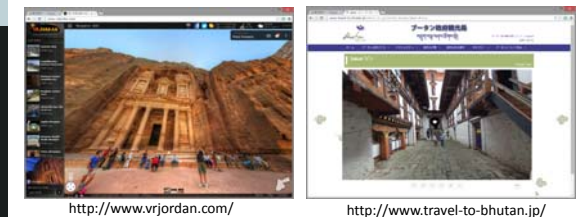
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## JTB's web page



## Virtual Tours

Nowadays many tourist destinations and hotels provide *virtual tours*



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## Tour Weaver: a software for making virtual tour



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## We developed a FREE tool for making virtual tours!



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<http://www.comp.tmu.ac.jp/kurata/SPSV/menu.html>

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## Merits of “Zen-Sekai Guide-San”

- Anyone can create story-based virtual tours easily at home
- Tour targets can be anywhere in the world, as long as they are supported by Google Street View
- Created tours can be released online
- It can be used for education



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## Today's Keywords

- Panorama
- Street view
- 3D laser scanning
- MMS
- Digital Archiving
- Self-driving car
- Crowd-sourcing
- Drone
- Virtual tour



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