Expanded View of the Earth
Augmented & Virtual Entities for Human Orientation

Matthias S. Moeller

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BEUTH HOCHSCHULE
FÜR TECHNIK
BERLIN
University of Applied Sciences

UNIVERSITY OF BAMBERG
OTTO-FRIEDRICH-UNIVERSITÄT BAMBERG

Augmented & Virtual Realities

Let's think about…

Historie

Presence

Future… and Beyond

Outline

1. Maps are always AR/VR
2. AR/VR mixed Reality
3. LUNS 3D Project
4. Next…?

1. Maps are always AR/VR

1. Maps are always AR/VR

Maps have been pretty rare/unique in the past…

…and thus some have been very valuable (not only) in ancient times!

https://previews.123rf.com/images/neyro2008/neyro20081511/neyro2008151100097/47419724-Piraten-Schatz-Insel-Vektor-Karte-Schiff-Abenteuer-Ozean-Sch-del-und-Papier-Navigationskunst-und-Kan-Lizenzfreie-Bilder.jpg

CARTOGRAPHIC TREASURES

AMERICI VESPVCI
ASIA
LYBONOTHS
EVROHOTVS
VNIVERSALIS COSMOGRAPHIA
SECVNDVM PTHOLOMEI TRA DITIONEM
ET AMERICI VESPVCII ALIORVM
LVSTRATIONES

Saxonia
GERMANIA
Flandria
Brabantia
Schlesia
Bohemia
Austria
Polonia
Hungaria
Dania
Suecia
Turingia
Moravia
Stiria
Alpes
Schleswig
Lubeck
Hamburg
Bremen
Magdeburg
Colonia
Schlesia
Oppelen
Ostrau
Troppau
Olmütz
Brünn
Znaim
Wien
Prag
Pilsen
Budweis
Leitmeritz
Saatz
Leitomischl
Iglau
Neuhaus
Tabor
Pisek
Krumau
Linz
Passau
Salzburg
Ingolstadt
Regensburg
Nürnberg
Bamberg
Würzburg
Fulda
Hessia
Frankfurt
Mainz
Trier
Aachen
Cleve
Münster
Osnabrück
Bremen
Hamburg
Lübeck
Rostock
Stettin
Danzig
Pomerania
Preussia
Ermeland
Memel
Königsberg
Insterburg
Gumbinnen
Tilsit
Ragnit
Samland
Curland
Livonia
Riga
Dünaburg
Pleskau
Wilna
Grodno
Brest
Pinsk
Kiew
Tschernigow
Smolensk
Mohilew
Orsza
Witebsk
Polotzk
Nowgorod
Ladoga
Wiborg
Abo
Stockholm
Upsala
Calmar
Wisby
Gothland
Oland
Bornholm
Seeland
Fünen
Jütland
Ripen
Aalborg
Wiborg
Viborg
Aarhus
Randers
Veile
Odense
Kopenhagen
Helsingör
Malmö
Lund
Kristianstad
Karlskrona
Kalmar
Westeras
Örebro
Karlstad
Göteborg
Halmstad
Helsingborg
Trondheim
Bergen
Stavanger
Christiansand
Drontheim
Hammerfest
Tornea
Lappland
Finnland
Nyslott
Kexholm
Viborg
Petersburg
Narwa
Reval
Pernau
Arensburg
Memel
Tilsit
Insterburg
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Drontheim
Hammerfest
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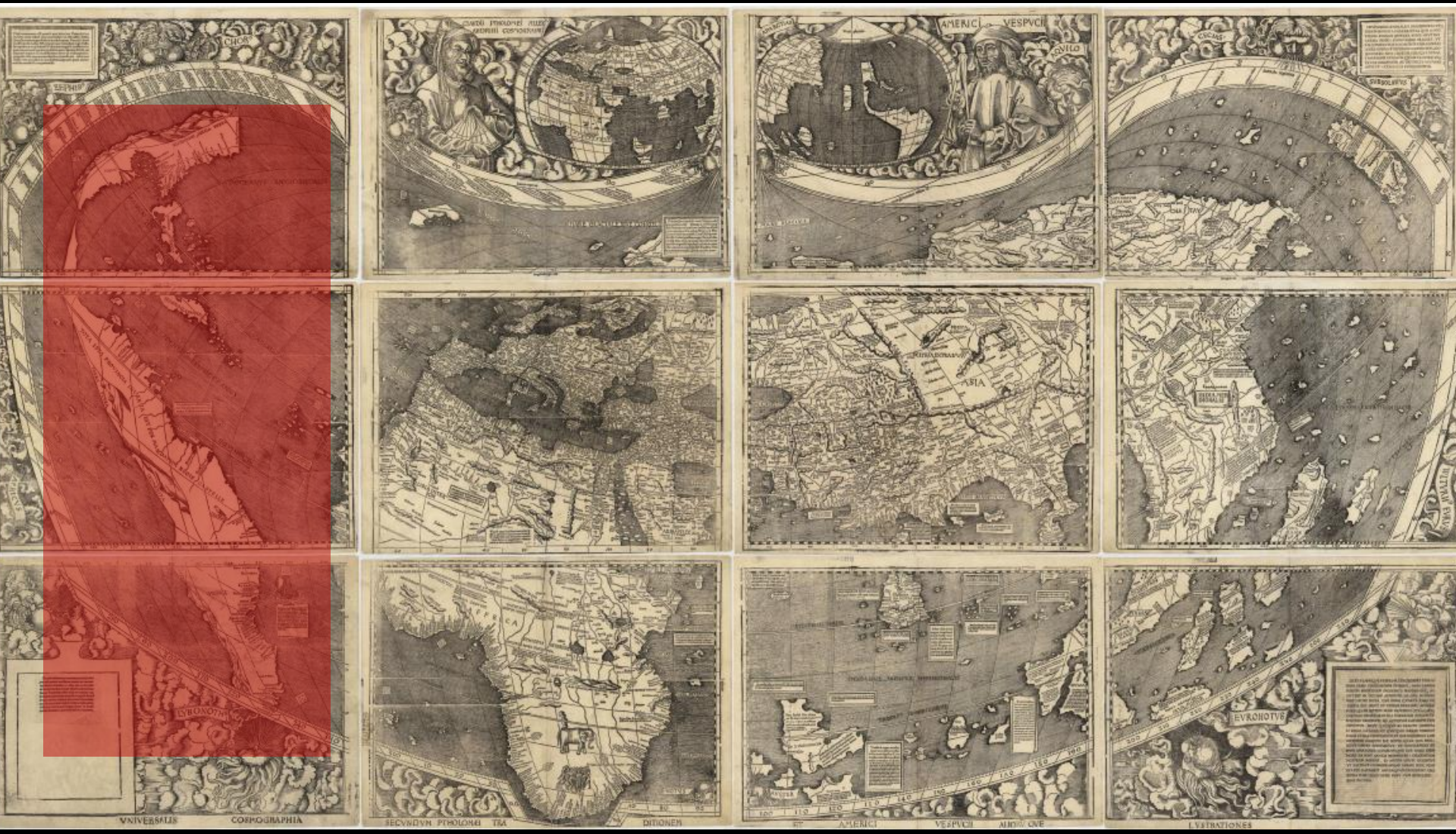
Lappland
Finnland
Nyslott
Kexholm
Viborg
Petersburg
Narwa
Reval
Pernau
Arensburg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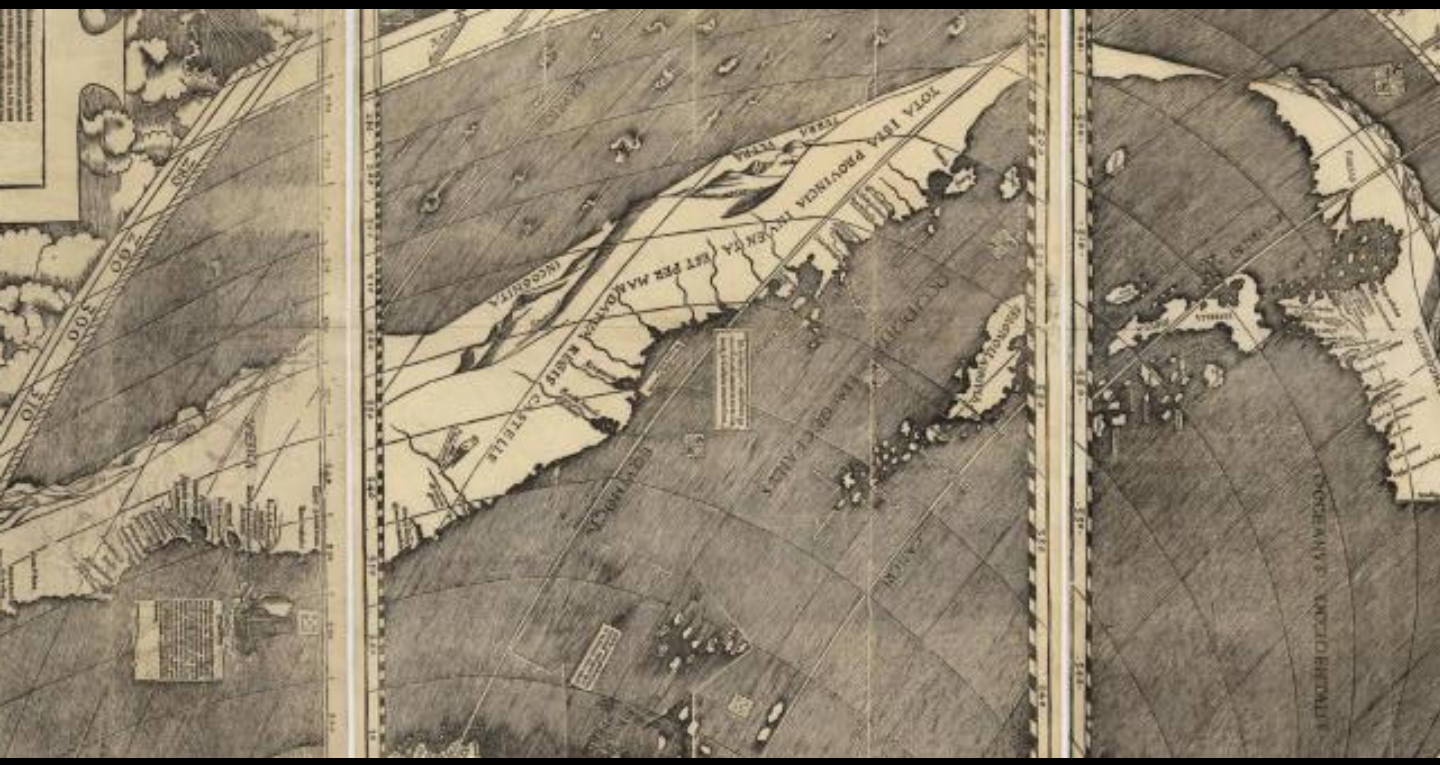
AUGMENTED REALITY



Caput Sancte crucis
Sancti michaelis
Rio de S. francisco
Rio de perera
Serra de S. maria de gracia
Rio de casa
porto real
Rio S. iheronimi
Rio de odio
Rio domezo
Monte fregoso
Abbatia omnium
Sanctorum
Rio S. iacobi
Rio S. augustini
Rio de S. lucia
Rio de virginia
Rio de S. iohani
porto seguro
Rio de brazil
Montpasqual
Rio de S. lucia
AMERICA

2. AR/VR Mixed Reality

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Augmented Reality (AR): extended Reality
Virtual Reality (VR): fictive & virtual Reality
Mixed Reality: AR & VR in a special combination

AR is used often to enhance digital maps & geovisualizations.

2. AR/VR Mixed Reality

AR Examples

Indoor Orientation: Museum, Exhibition, Tradefair;

Navigation: Routing, Head Up Display; developed for aircrafts (military fighters), now common in (almost all) cars.

https://upload.wikimedia.org/wikipedia/commons/f/f3/E60hud.JPG

2. AR/VR Mixed Reality

AR Examples

Gaming: Pokemon hunt digitally produced figures;

Business: Superimposed of a reality photo with additional information like text, images;
e.g. Immoscout24 App.

2. AR/VR Mixed Reality

3. LUNAS 3D HYBRID

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LUNAS 3D HYBRID
Mobile **L**aser **A**ccident **R**ecording & **An**alysis **S**ystem with hybrid 3D Augmented Reality support.

R&D in cooperation with RABO Bormann, Rabenau with ZIM funding.
PhD thesis entitled: “Usage of Geo-Sensors in a Virtual Reality Environment“

3. LUNAS 3D HYBRID

Combination of low-cost sensors, e.g.:
Camera, GPS, Compass, INS: Gyrosensor & Accelerometer, Laser-distance measurement.

Tablet PC for control of the systems, for on screen visualization & as a WLAN base station.

Camera
Laser distance unit
INS
Processing unit
Tablet PC

3. LUNAS 3D HYBRID

Recording of the accident with the camera (photos) from different positions & various view angles.

Highly precise, interactive measurement of distances in the live camera photo.
Superimposing of measured points/traces as **AR**.
Reconstruction of the entire scene at every time.

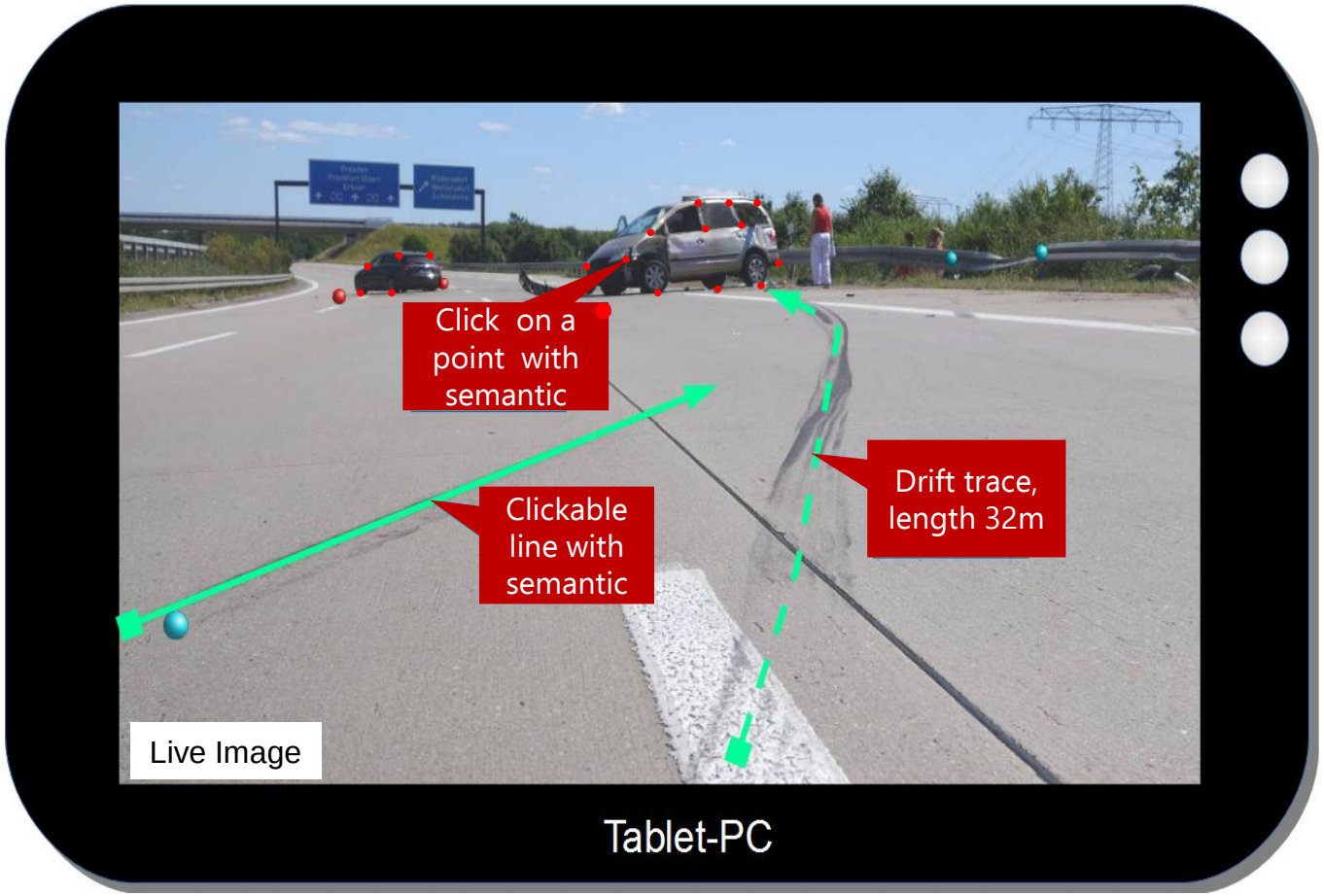
Objective Documentation

3. LUNAS 3D HYBRID

https://www.polizei.bayern.de/cgi-bp/bildergalerie/bg.pl?cmd=sc&rf=82475&fl=unfall.jpg&wi=0

http://www.unfallaufnahme.info/content/ausruestung/

3. LUNAS 3D HYBRID



Documentation of the accident scene: accepted by Police & Justice.

4. Next…?

4. Next…?

Extending LUNAS 3D HYBRID for indoor mapping/navigation towards digital office (competition for Google Tango/ARCore).

MA thesis Project „AR Mars landing sites“ for traing of future astronauts on Mars mission.

Development of the gaming industry; e.g. new VR/AR glasses with advanced capabilities.

THANKS

Matthias S. Moeller, Priv.-Doz., PhD
University of Bamberg – Geography
Beuth University for Applied Sciences Berlin
matthias.moeller@uni-bamberg.de