



RIEGL VMX-250 Mobile Laser Scanning System am Beispiel der Paläste am Canal Grande, Venedig *Hamburger Anwenderforum, Juni 2011*



Nikolaus STUDNICKA, Gerald ZACH, Phillipp AMON, Martin PFENNIGBAUER
RIEGL Laser Measurement Systems GmbH / Austria



Terrestrial Scanning



Airborne Scanning



Mobile Scanning



Industrial Scanning





V-Line of 2D- and 3D laser scanners

Airborne Scanning

RIEGL VQ-480



- Scan Range:** • 60 deg
Laser Clock: • 200 kHz
Max. Range: • 600 m (60%)

Mobile Scanning

RIEGL VQ-180



- 100 deg
• 200 kHz
• 500 m (20%)

RIEGL VQ-250



- 360 deg
• 50/300 kHz
• 500/200 m (80%)

Terrestrial Scanning

RIEGL VZ-400



- 100 x 360 deg
• 100/300 kHz
• 500 m (80%)



Mobile Laser Scanning
System *RIEGL* VMX-250

Effektive Messrate	2 x 300 kHz
Scanrate	2 x 100 Linien / sec
Max Messentfernung	500 m @ $\rho \geq 80\%$ und 100 kHz 75 m @ $\rho \geq 10\%$ und 300 kHz
Genauigkeit	10 mm
Präzision	5 mm
Position (absolut)	typ. 20-50 mm
Position (relativ)	typ. 10 mm
Roll- & Nickwinkel	0.005
Kurswinkel	0.015
Gewicht "Measuring Head"	ca. 38 kg
Gewicht "Control Unit"	ca. 18 kg
Laser Klasse	1 (augensicher)

Spezifikation des *RIEGL* VMX-250

Terrestrial Scanning

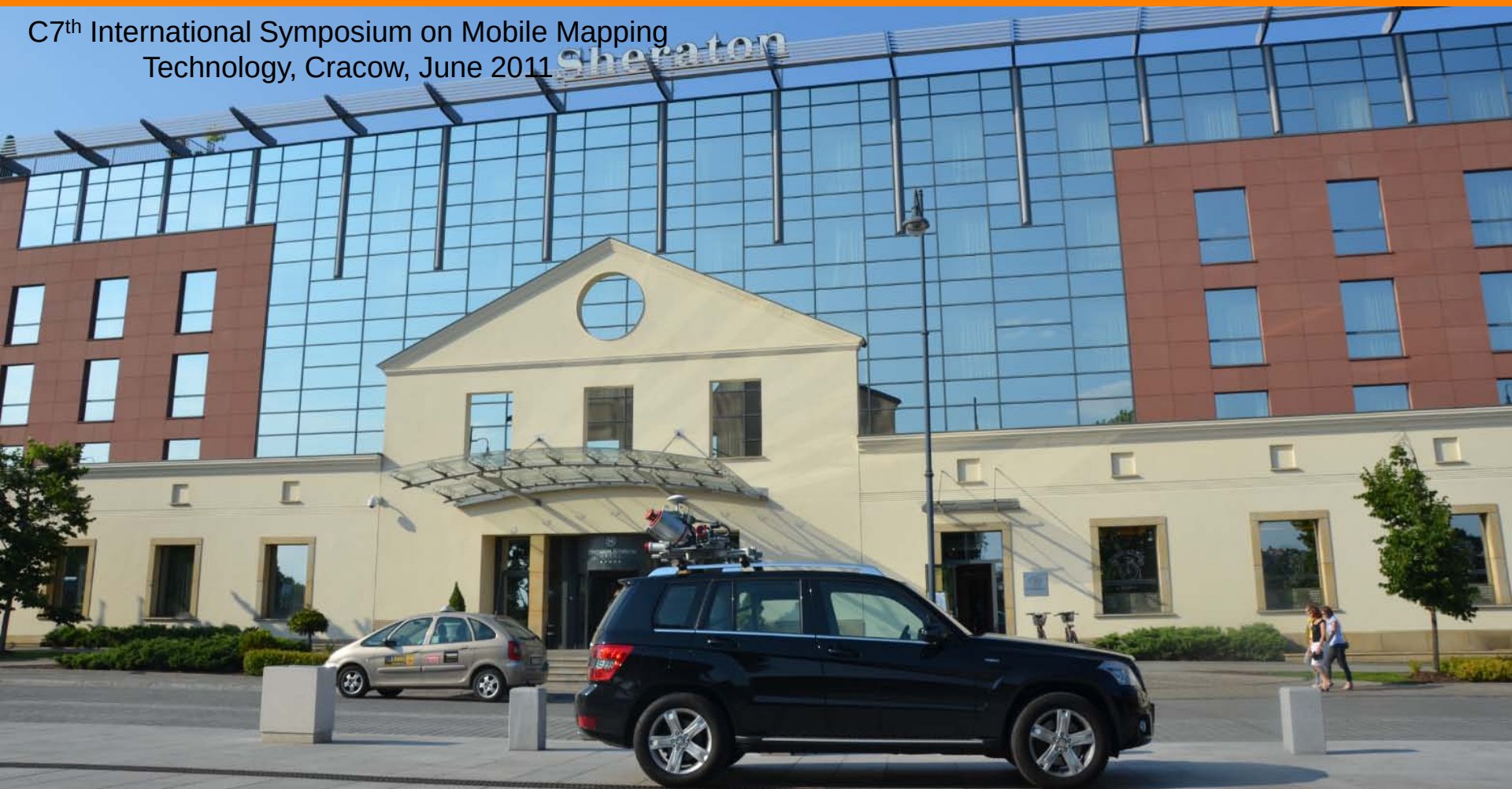
Mobile Scanning

Airborne Scanning

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C7th International Symposium on Mobile Mapping
Technology, Cracow, June 2011



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Empfohlene Kamera Typen	1.4 MPx	2.0 MPx	5.0MPx
Auflösung ⁽¹⁾	1360x1024	1920x1080	2448x2050
Max. Bildrate	20 B/sec	32 B/sec	15 B/sec
Sensor	2/3" Farb CCD		
Verschluss	Global / Progressiv Scan		
Pixel Größe	6.45µm	5.50µm	3.45µm
Objektiv	5 mm, C-Montage		
Gesichtsfeld	ca. 80° x 65° ⁽²⁾		

Spezifikation des *RIEGL* VMX-250-CS6 Kamera Systems

(1) höhere Auflösungen auf Anfrage. Externe Kameras (z.B. DSLR oder IR-Kameras) anderer Hersteller integrierbar.

(2) Für das Canal Grande Projekt wurden 12 mm Objektive mit einem Blickfeld von ca. 40 x 30 verwendet.

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Edit Camera 1...

Device | General | Mounting | Processing | White Balance

INTRINSIC PARAMETERS

dx [m]: 3.45E-6 dy [m]: 3.45E-6

Nx [pix]: 2448 Ny [pix]: 2050

INTERNAL CALIBRATION PARAMETERS

fx [pix]: 1448.953917257 fy [pix]: 1449.656127401

Cx [pix]: 1255.604573437 Cy [pix]: 1023.485755151

k1 [1]: 0.0693142420918853 k2 [1]: -0.317066863421277

k3 [1]: 0.644543873073102 k4 [1]: -0.431294515021756

p1 [1]: 0.0022985177340416 p2 [1]: 0.003337088117868

Import...

OK Cancel Help

Edit Camera 1...

Device | General | Mounting | Processing | White Balance

TRANSFORMATION PARAMETERS

Matrix CMCS -> IMU:

...891290944877	...306016137506	...791108626013	...636125058867
...031415239785	...922877563862	...517570304655	...280488925287
...938076020938	...597139107759	...799764688259	...495331399143
0	0	0	1

Navigation device:

 INS-GPS 1

OK Cancel Help

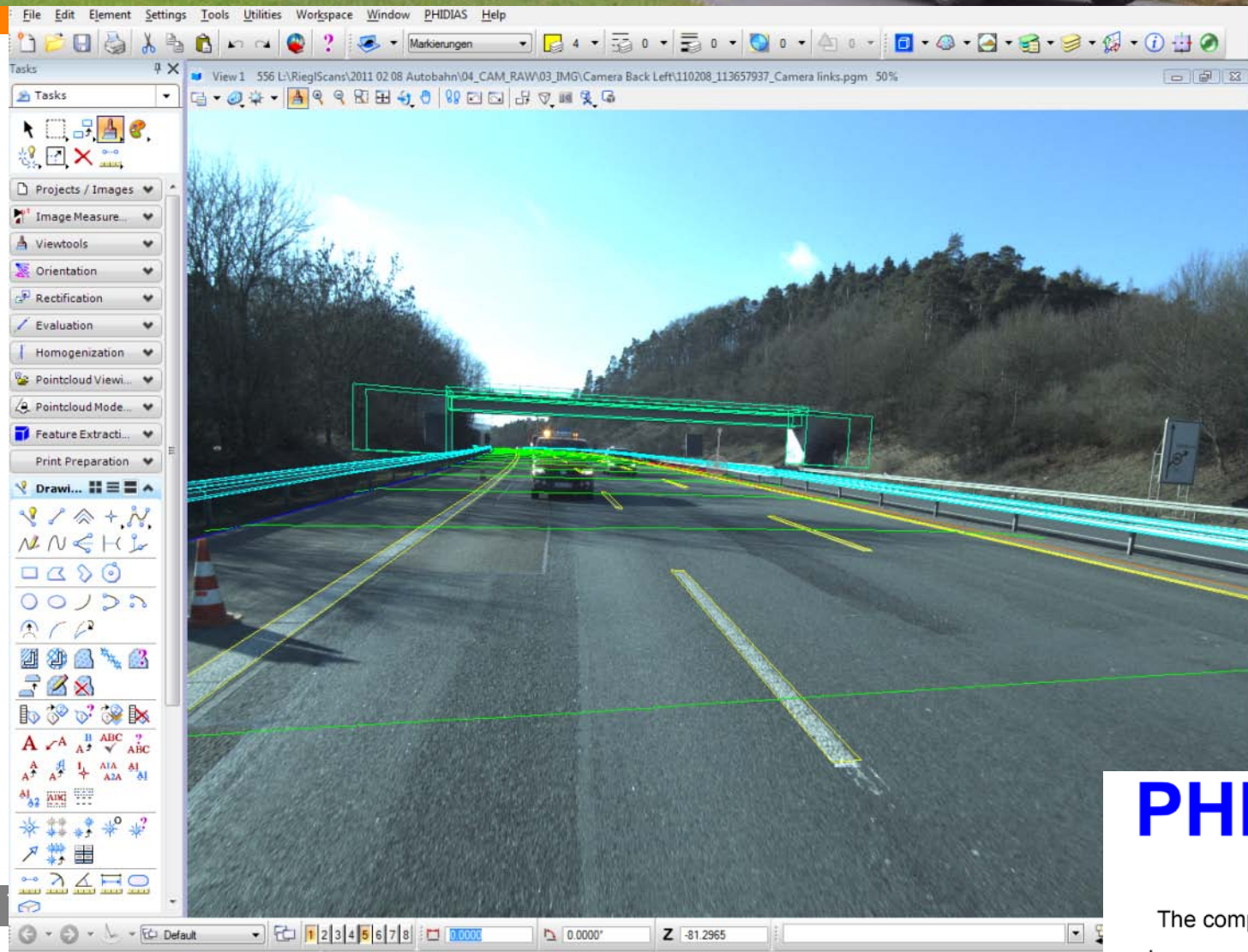


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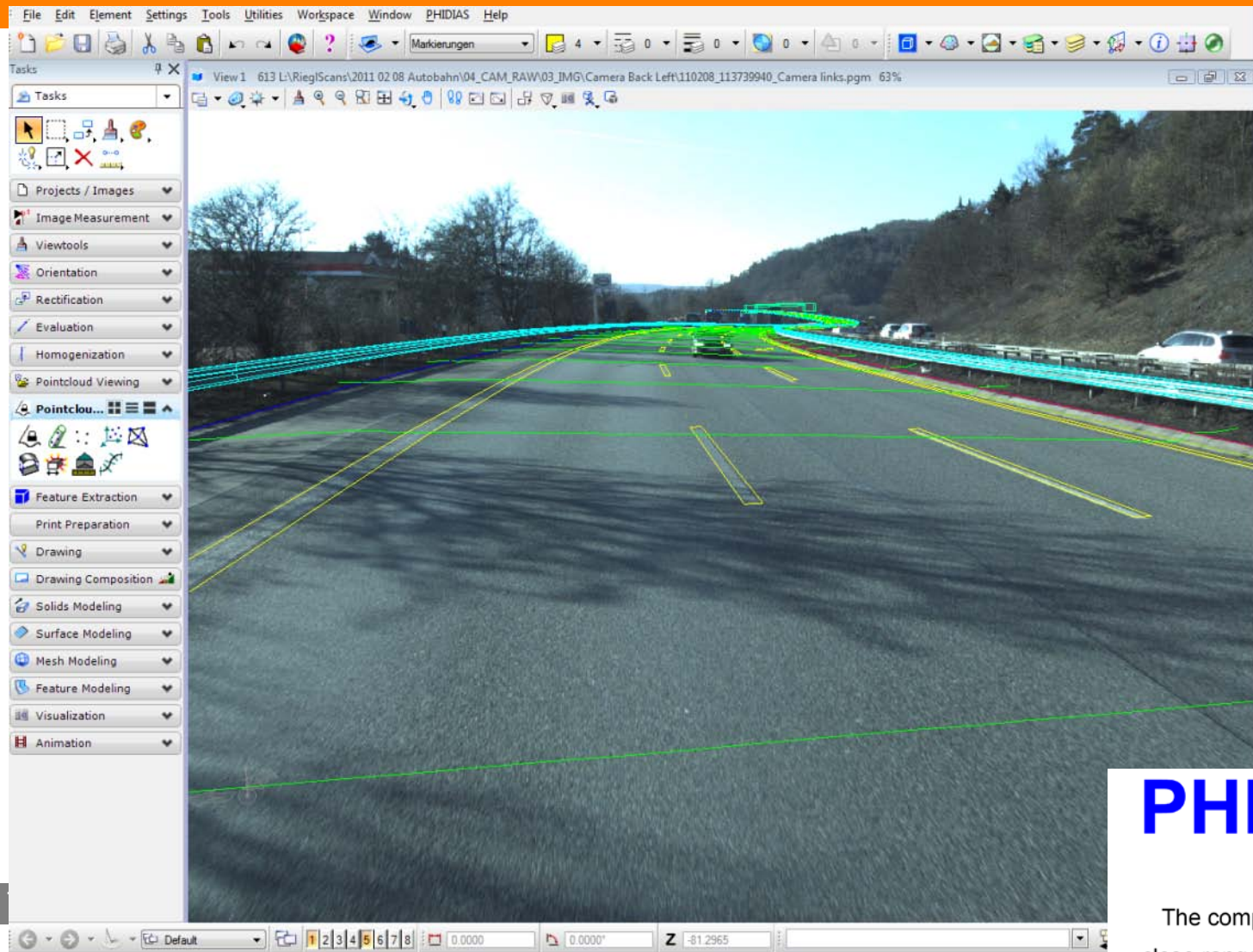
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Industrial Scanning



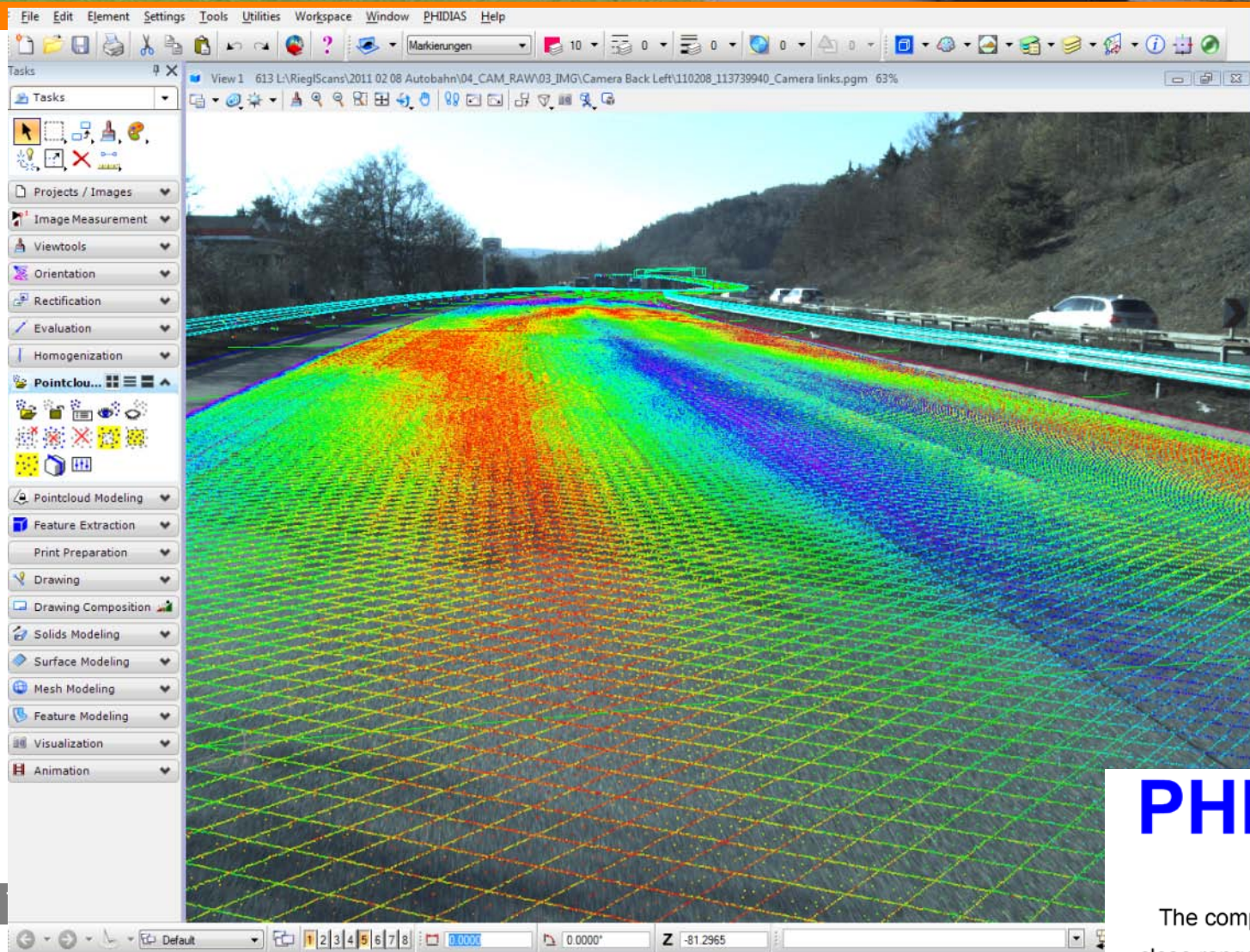
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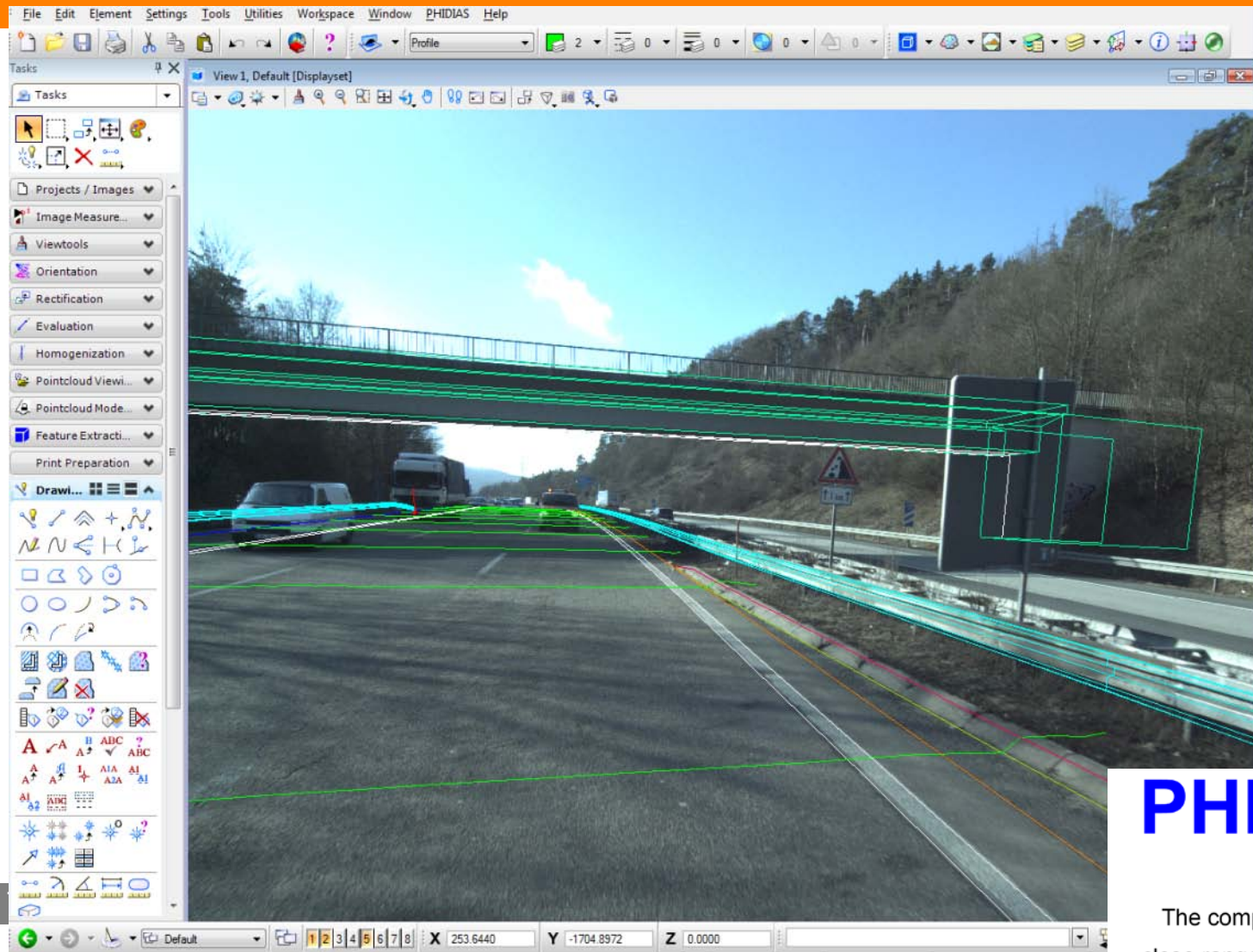
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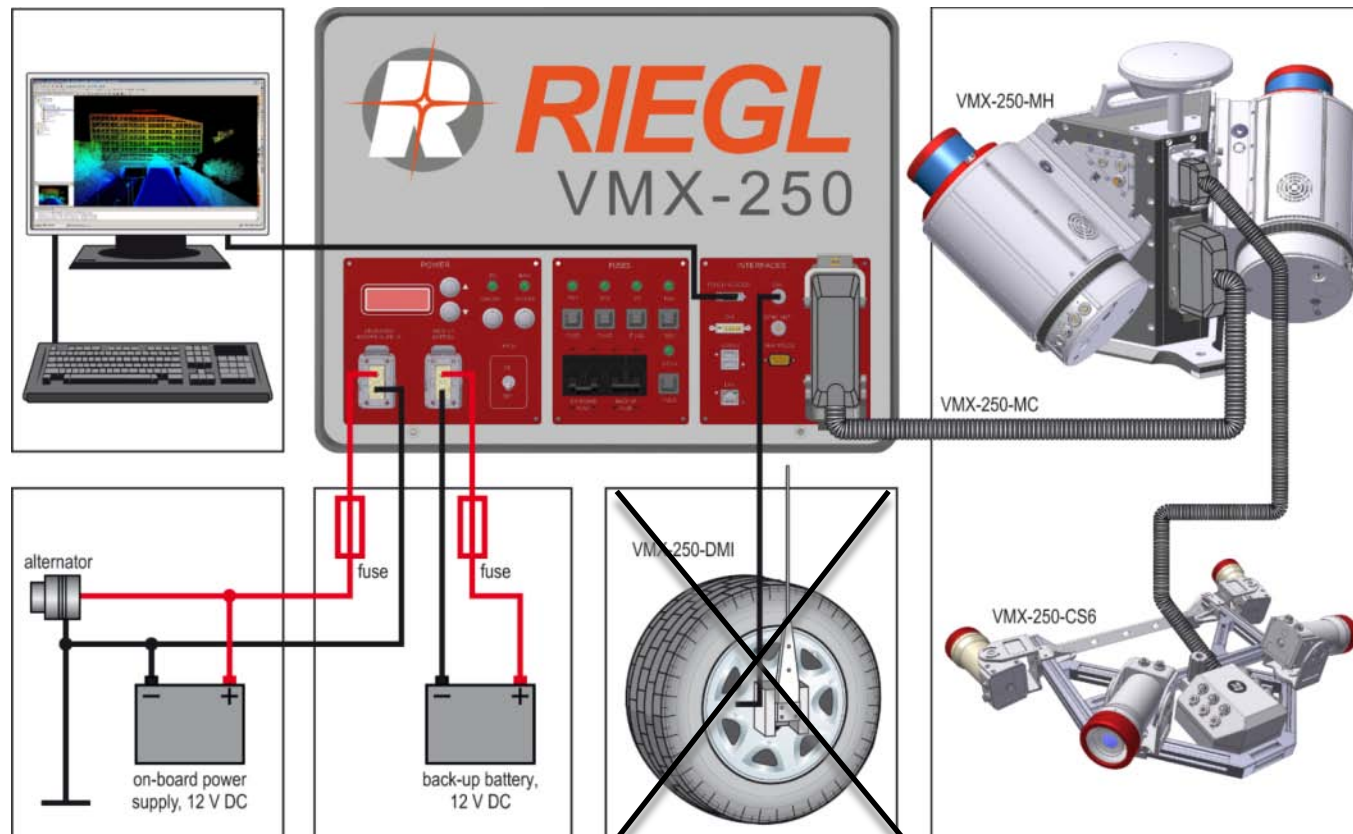


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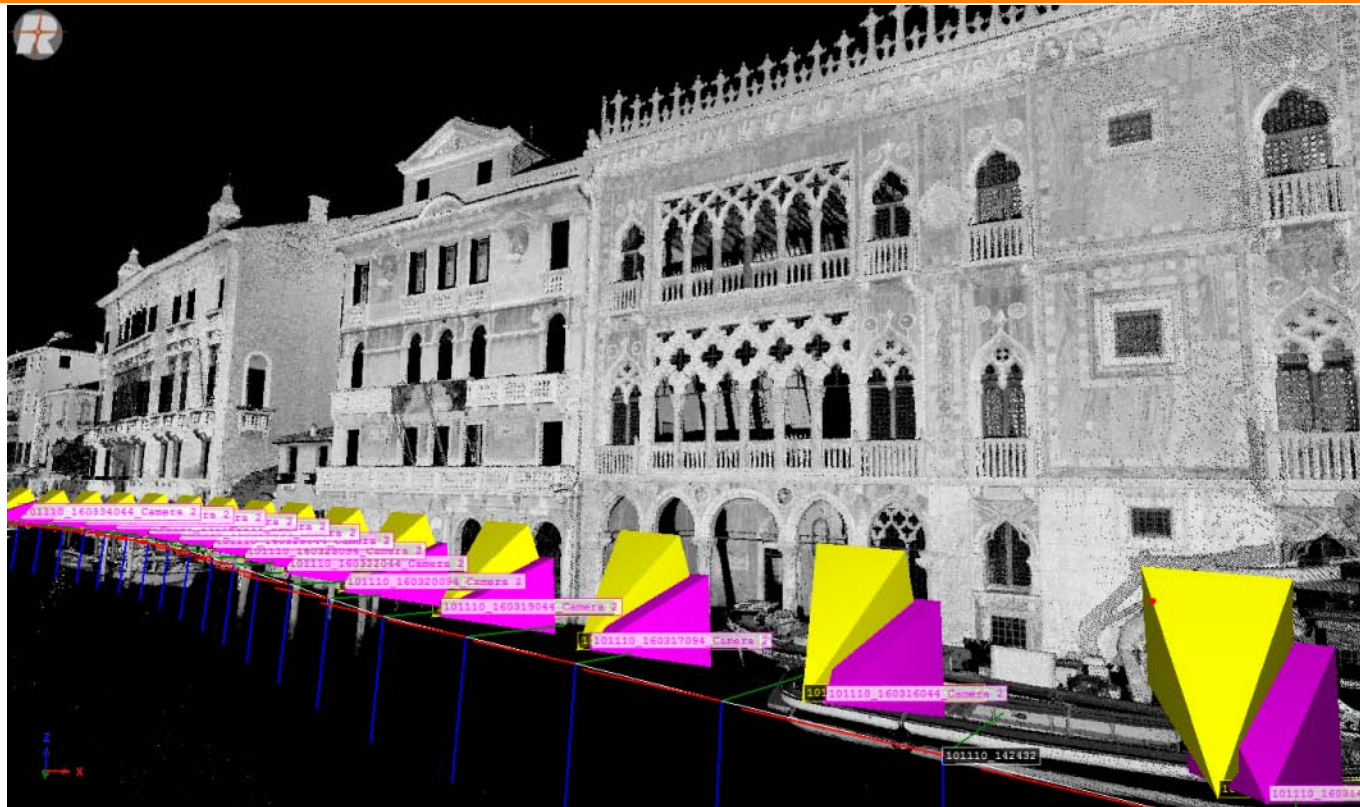


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Darstellung der Kamerapositionen zum Zeitpunkt deren synchroner Triggerung. Gelb und rosa symbolisieren Kamera 1 und 2. Die rote Linie beschreibt die Trajektorie. Die roten, grünen und blauen Achsen zeigen das bewegte Koordinatensystem der IMU. Die Scandaten der Fassaden sind in graucodierter Reflectance (Reflexionsgrad) eingefärbt.

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Comune di Venezia (VE) - CAP 30100

1 Casa 8 - Trovata a Venezia

Meteo Giornaliero Martedì 9 Mercoledì 10 Giovedì 11 Venerdì 12 Sabato 13 Domenica 14 Lunedì 15 Fino al 23 Novembre

Previsioni Triorarie Previsioni Orarie Sperimentali

Ora	Tempo	T (°C)	Vento (km/h)	Precipitazioni	W chill	Umidità	Visibilità	Quota 0°C
01.00	nubi sparse	9.8°	WSW 7 / max 8	0.2 mm deboli	9 °C	99 %	<10km discreta	1650m neve a 1350m
04.00	nebbia	9°	NW 3 deboli	0.1 mm deboli	8 °C	99 %	<1km foschia	1630m neve a 1330m
07.00	nebbia	8.5°	N 1.5 deboli	0.1 mm deboli	8 °C	100 %	<1km foschia	1630m neve a 1330m
10.00	nubi sparse	11.1°	N 5 / max 5 deboli	<0.1 mm deboli	11 °C	93 %	>10km buona	1600m neve a 1360m
13.00	poggia e schiarite	12.9°	calma	1.3 mm deboli	12.9 °C	81 %	>10km buona	1680m neve a 1340m
16.00	poggia	13°	S 6 / max 6 deboli	0.8 mm deboli	13 °C	85 %	>10km buona	1730m neve a 1420m
19.00	poggia	12.2°	SSW 9 deboli	1.6 mm deboli	11 °C	93 %	>10km buona	1760m neve a 1390m
22.00	poggia	11.6°	W 9 / max 10 deboli	1.8 mm deboli	11 °C	94 %	>10km buona	1770m neve a 1390m
01.00	poggia deboli	10.3°	W 7 / max 10 deboli	0.2 mm deboli	10 °C	97 %	<10km discreta	1770m neve a 1470m
Modeli climatiche mese di Novembre		min 4° max 12°	ENE 4 deboli	87 mm (cumulati)	min 4° max 12°	79 %	n/d	n/d
Mare mosso • altezza onda: 58 cm • Dettagli Mare e Vento								

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Ora	Tempo	T (°C)	Vento (km/h)	Precipitazioni	W chill	Umidità	Visibilità	Quota 0°C
01.00	poggia deboli	10.3°	W 7 / max 10 deboli	0.2 mm deboli	10 °C	97 %	<10km discreta	1770m neve a 1470m
04.00	poco nuvoloso	8.3°	W 6 / max 8 deboli	- assenti -	8 °C	99 %	<10km discreta	1780m
07.00	nebbia	7.1°	W 5 deboli	- assenti -	7 °C	100 %	<10km scarsa	1760m
10.00	nebbia	10.7°	NW 4 deboli	- assenti -	11 °C	94 %	<10km scarsa	1720m
13.00	sereno	13.8°	calma	- assenti -	13.8 °C	79 %	>10km buona	1710m
16.00	sereno	13.5°	SSW 4 deboli	- assenti -	14 °C	78 %	>10km buona	1770m
19.00	sereno	9.9°	SW 7 / max 7 deboli	- assenti -	9 °C	93 %	<10km discreta	1770m
22.00	sereno	7.9°	WSW 9 / max 10 deboli	- assenti -	7 °C	97 %	>10km buona	1820m
01.00	nebbia	6.9°	WSW 10 / max 14 deboli	- assenti -	5 °C	99 %	<1km foschia	1920m
Modeli climatiche mese di Novembre		min 4° max 12°	ENE 4 deboli	87 mm (cumulati)	min 4° max 12°	79 %	n/d	n/d
Mare poco mosso / mosso • altezza onda: 38 - 59 cm • Dettagli Mare e Vento								

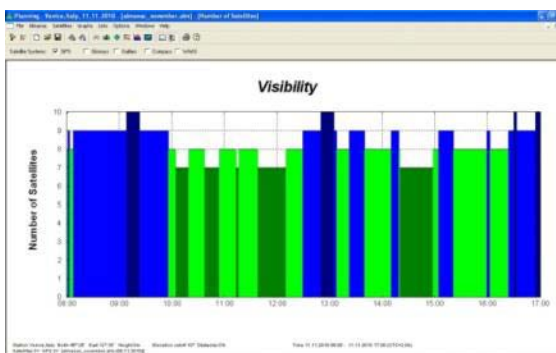
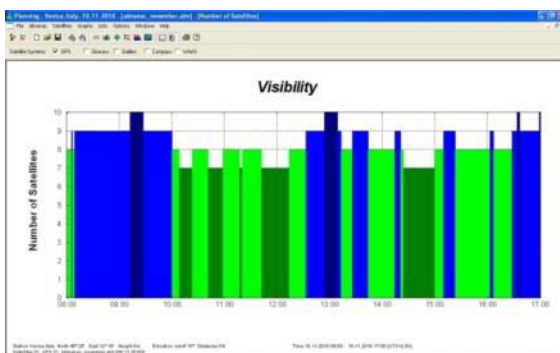
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Previsioni Triorarie Previsioni Orarie Sperimentali

Ora	Tempo	T (°C)	Vento (km/h)	Precipitazioni	W chill	Umidità	Visibilità	Quota 0°C
01.00	nebbia	6.9°	WSW 10 / max 14 deboli	- assenti -	5 °C	99 %	<1km foschia	1920m
04.00	nebbia	6.8°	WSW 9 / max 15 deboli	- assenti -	6 °C	99 %	<100m scarsa	2290m
07.00	nebbia	6.3°	WSW 8 / max 13 deboli	- assenti -	6 °C	100 %	<50m pessima	2750m
10.00	nebbia	9.8°	SW 6 / max 9 deboli	- assenti -	9 °C	94 %	<100m scarsa	2760m
13.00	nubi sparse	13.3°	SW 7 deboli	- assenti -	13 °C	75 %	>10km buona	2760m
16.00	nubi sparse	13.5°	SW 6 deboli	- assenti -	13 °C	74 %	>10km buona	2780m
19.00	coperto	11.3°	WSW 2 deboli	- assenti -	12 °C	89 %	>10km buona	2760m
22.00	poco nuvoloso	9.9°	NNE 5 / max 6 deboli	- assenti -	10 °C	94 %	>10km buona	2790m
01.00	nubi sparse	8.7°	NNE 8 / max 10 deboli	- assenti -	8 °C	98 %	>10km discreta	2860m
Modeli climatiche mese di Novembre		min 4° max 12°	ENE 4 deboli	87 mm (cumulati)	min 4° max 12°	79 %	n/d	n/d
Mare poco mosso • altezza onda: 25 cm • Dettagli Mare e Vento								



Planung der Mission: Wetter und Verfügbarkeit von GPS Satelliten an den Messtagen in Venedig

Terrestrial Scanning

Mobile Scanning

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Industrial Scanning



20.00m 5.00kmh 300 kHz

Configuration Parameter

Name: 20.00m 5.00kmh 300 kHz

Scanner Type: VQ-250 (Scanner 1, Scanner 2) ☐ Show all

Scanner: Scanner 1 (S9997363)

Mission Parameter

Target Distance: 20.00m

Ground Speed: 5.00km/h

Scanner Parameter

Scan Mode: Line

Measurement Program: 300 kHz

Monitor Step Multiplier: 26

Line Start: 0.000deg

Line Stop: 360.000deg

Line Increment: 0.0663deg

Information

Scanner Parameter:

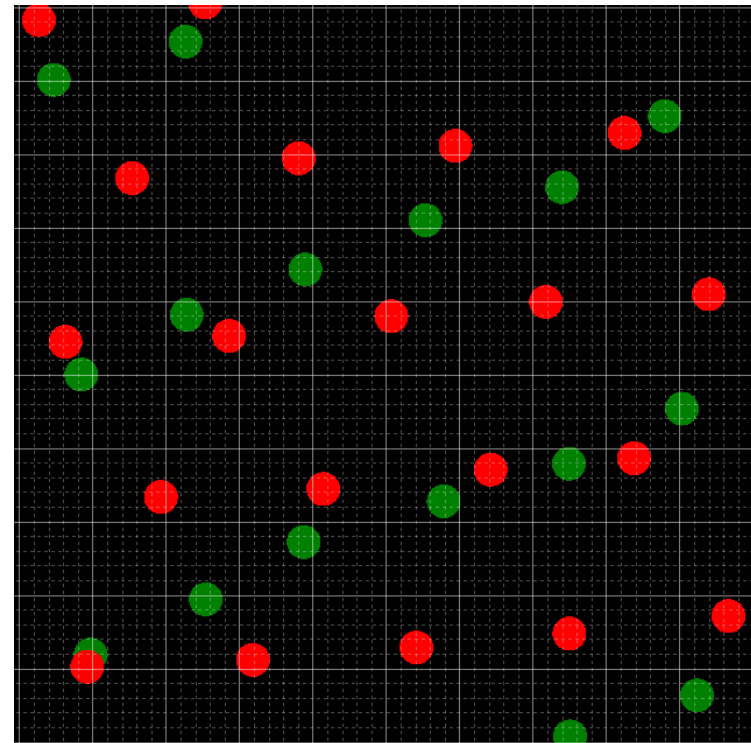
Scan Speed: 58.0lines/s

Scan Pattern:

Line Distance: 0.0239m

Point Distance: 0.0231m

Point Density: 1804.59pt/m²



links: Angewendete Scannerparameter für einen RIEGL VQ-250 Laser Scanner: 58 Scanlinien/sec mit einer Winkelauflösung von 0,0663 zwischen zwei Laserschüssen -> resultiert in einer Punktauflösung auf der Fassade von ca. 2,3 cm pro Scanner und Scan

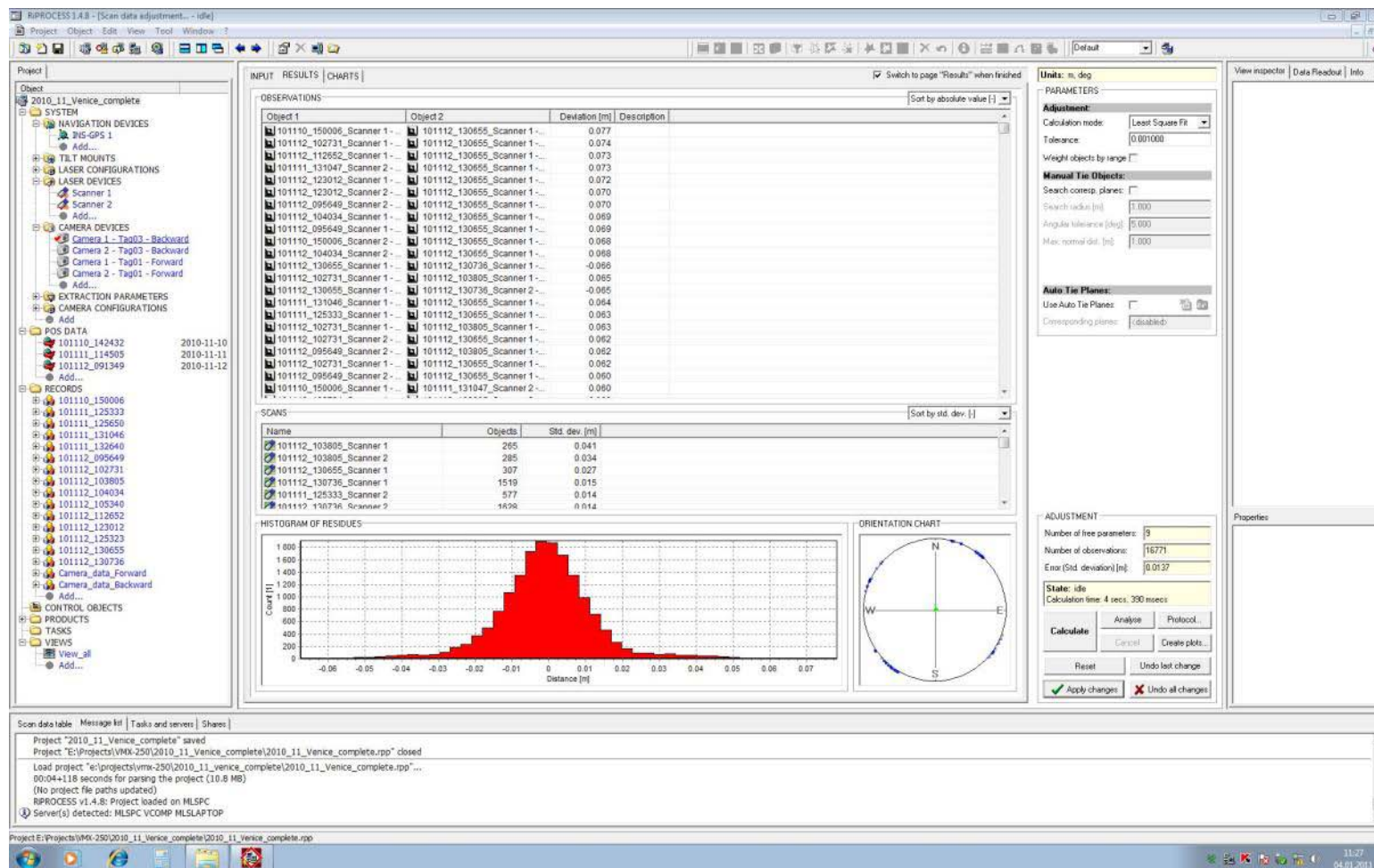
rechts Punktmuster auf der Fassade (rot = linker Scanner 1, grün = rechter Scanner 2), ergibt für diesen Fassadenausschnitt 3.500 Punkte pro Quadratmeter von beiden Scannern (Rasterlinienabstand = 1cm)

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 Kanal von RieglLMS 

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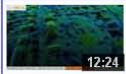
RIEGL VMX-250 in Venice
Von: RieglLMS | 14. Februar 2011 | 13 Aufrufe

The RIEGL VMX-250 mobile laser scanning system on duty in Venice, Italy. This joint project carried out by RIEGL, Università IUAV di Venezia, EKG Baukultur and Phocad results in impressive results, due to the first on site use of the new, complementary VMX-250-CS6 camera system.

[... \(Weitere Informationen\)](#)

Uploads (7)

 **RIEGL VMX-250 in Venice**
13 Aufrufe - vor 16 Stunden
6:00

 **RIEGL Overview**
19 Aufrufe - vor 1 Monat
12:24

 **RIEGL VMX-250 in Japan**
11 Aufrufe - vor 1 Monat
10:03

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You can find the movie in the Internet:

www.youtube.com/user/RieglLMS

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Foto

Terrestrial Scanning

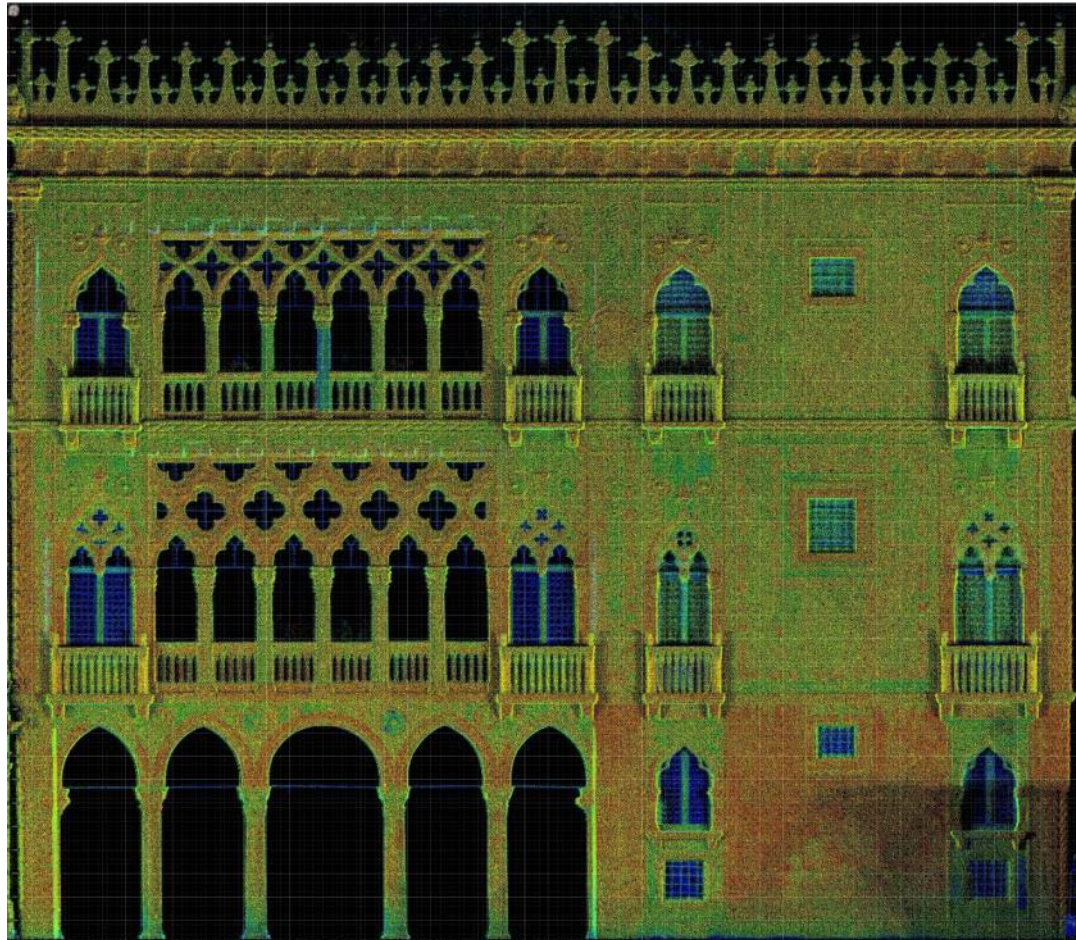
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Google Earth Screenshot 02/2011



Orthogonale Darstellung der Punktwolke

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Orthophoto

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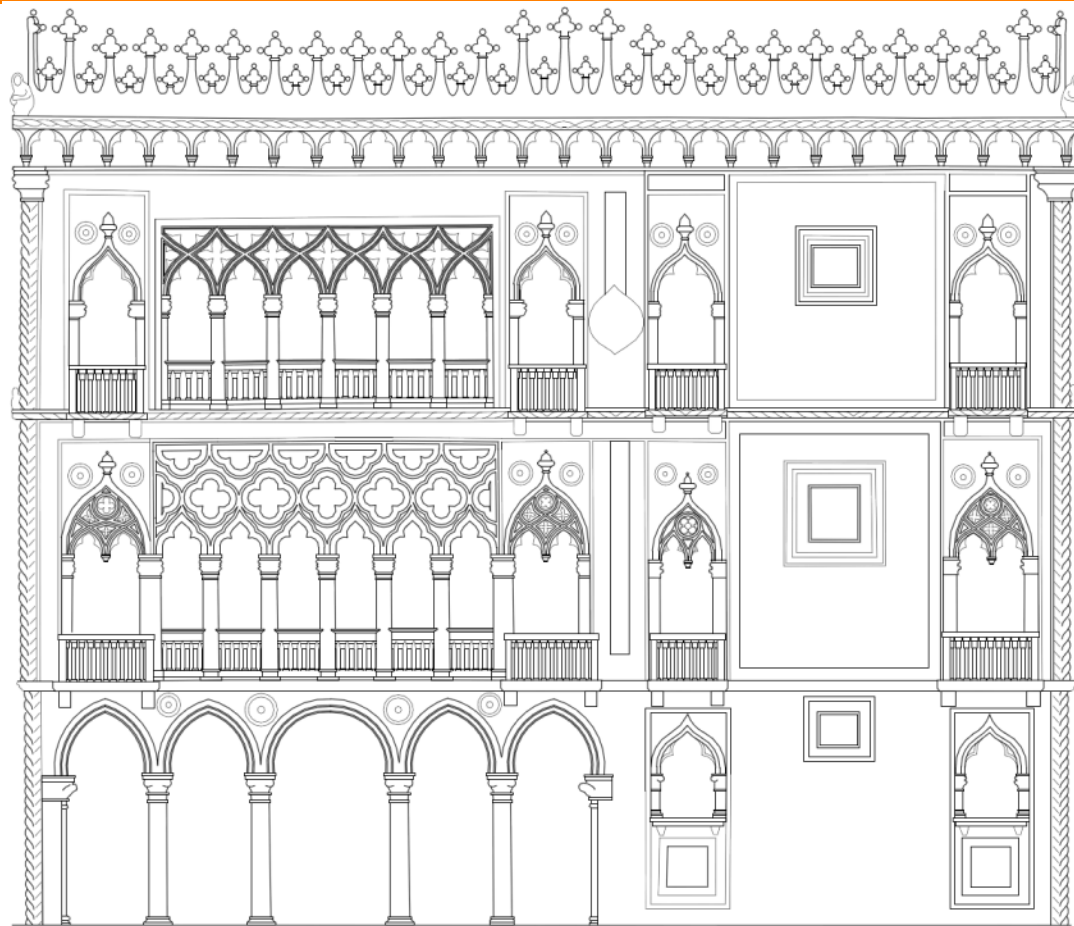


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2D Strichauswertung der Punktwolke

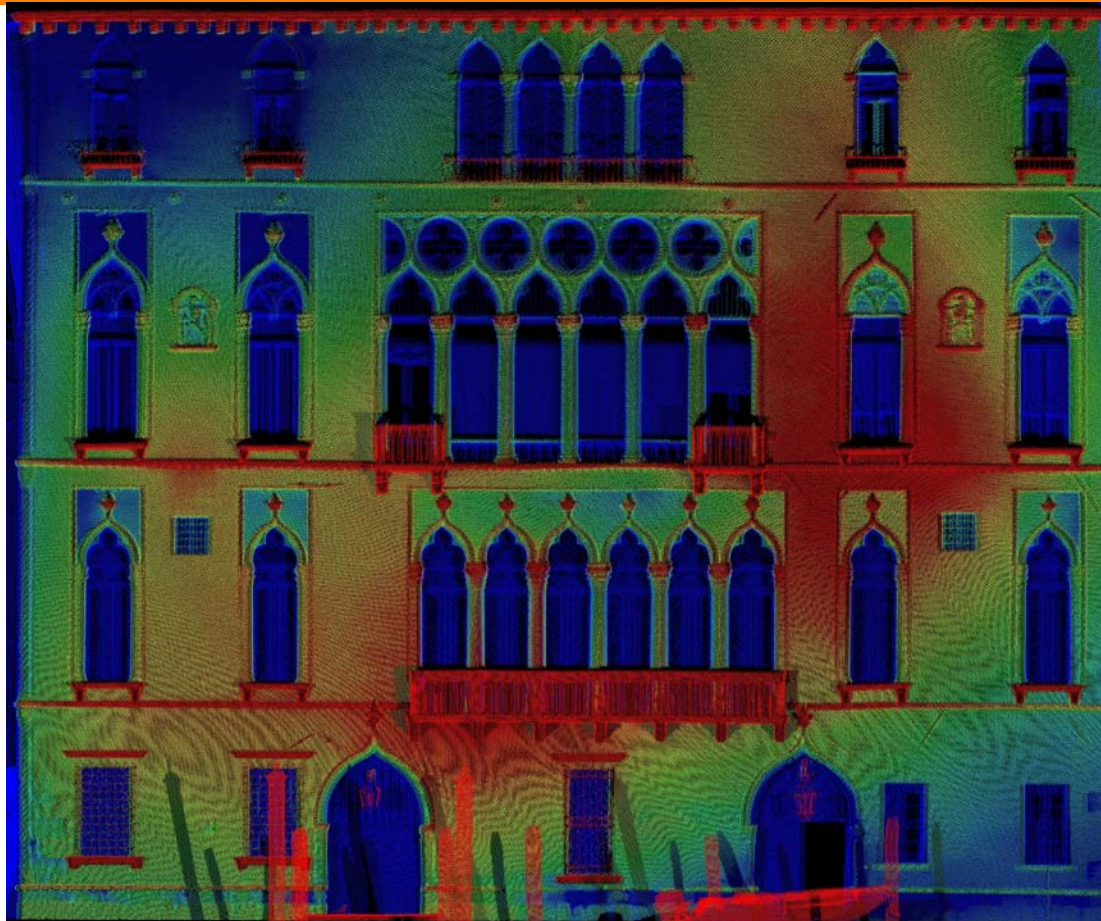
www.ekg-baukultur.com

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Orthogonale Darstellung der Punktwolke

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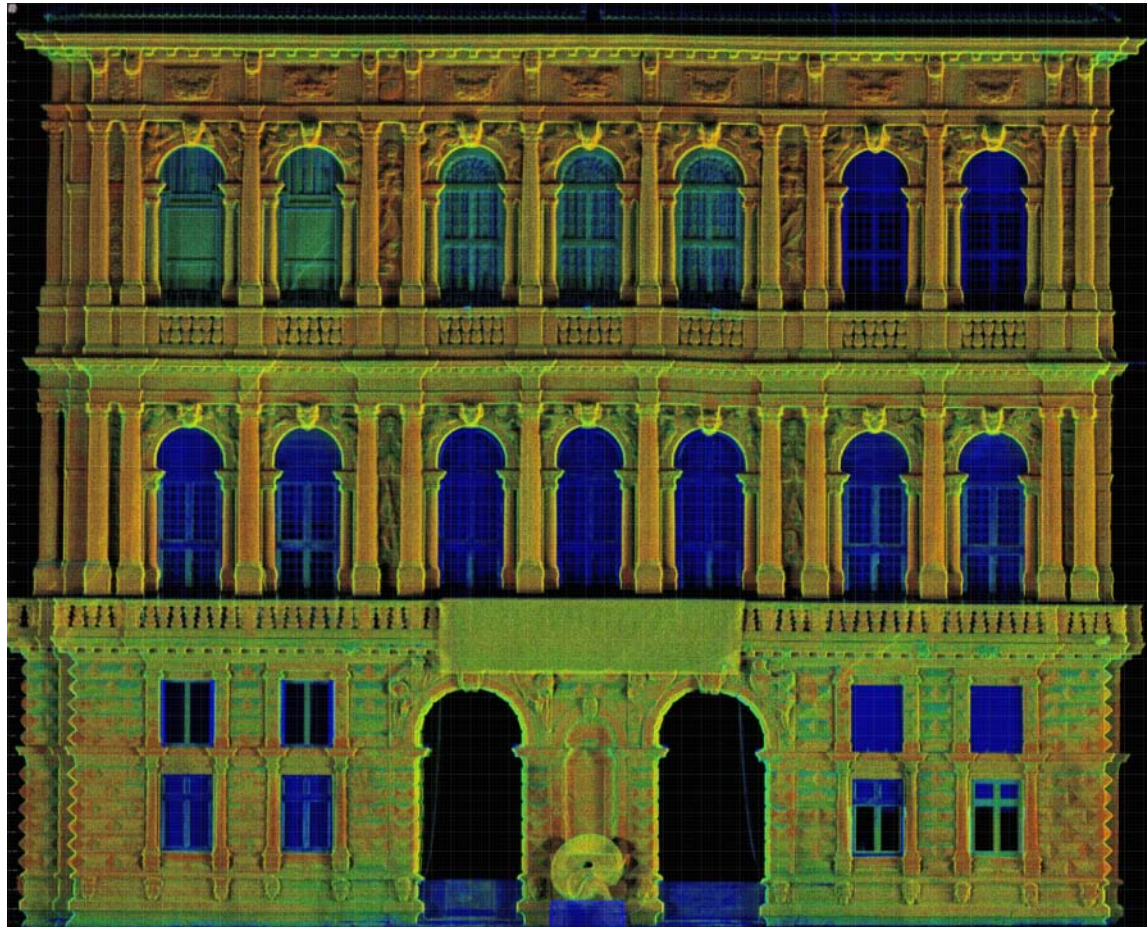
Foto

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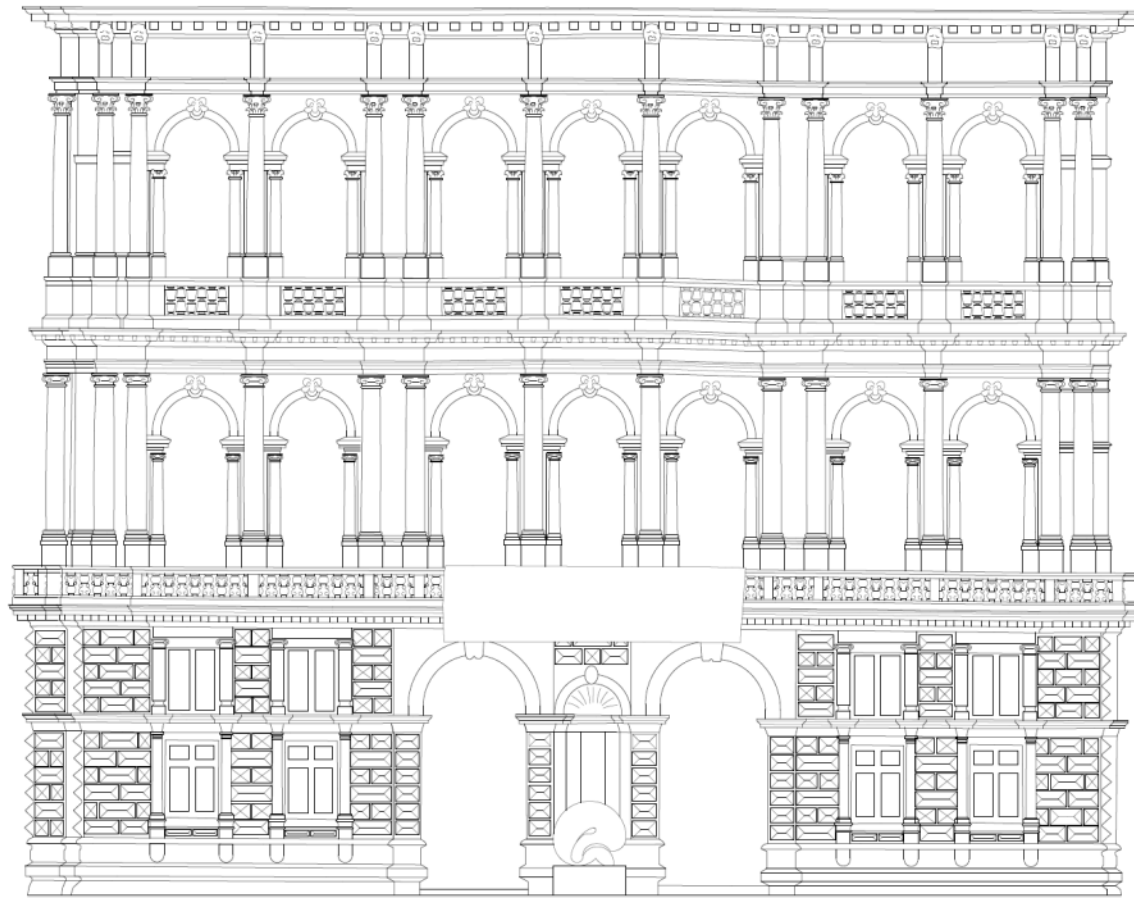
Orthogonale Darstellung der Punktwolke

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2D Strichauswertung der Punktwolke

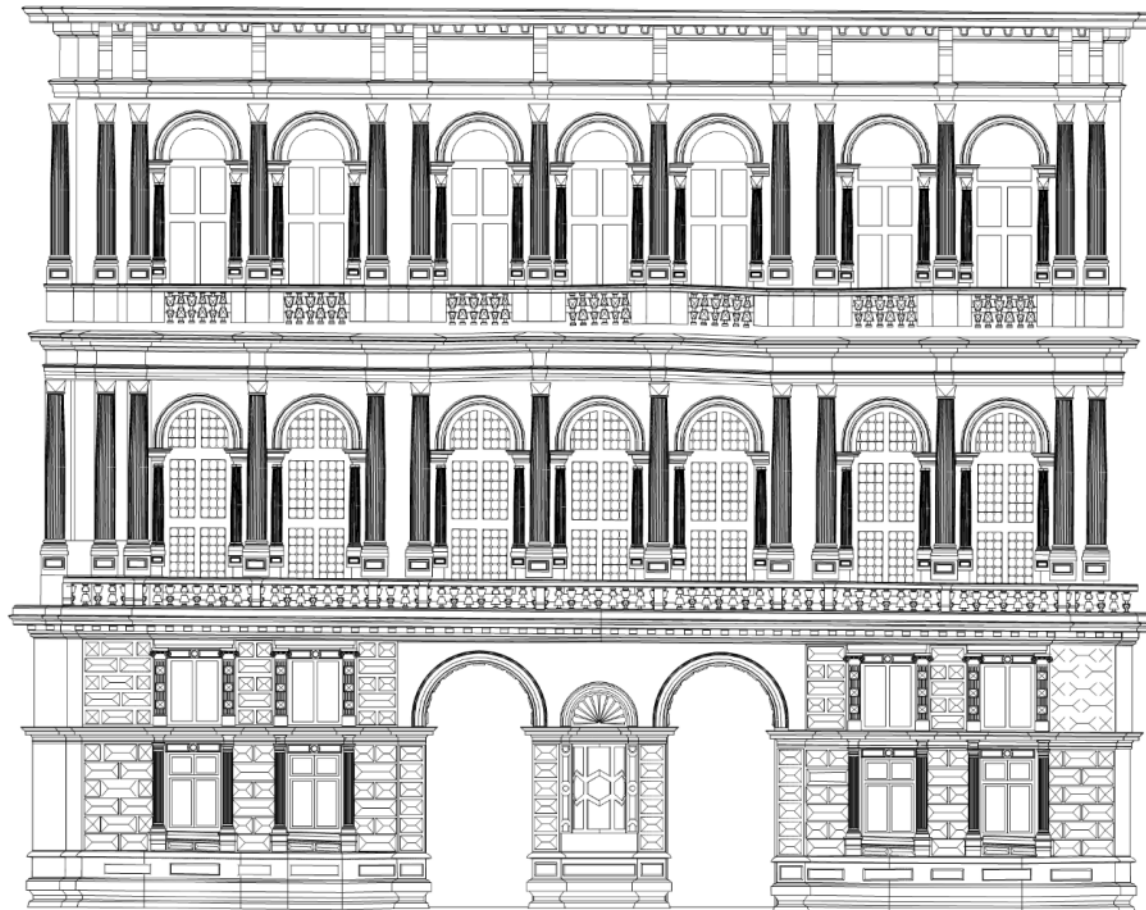
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2D Strichauswertung der Punktwolke

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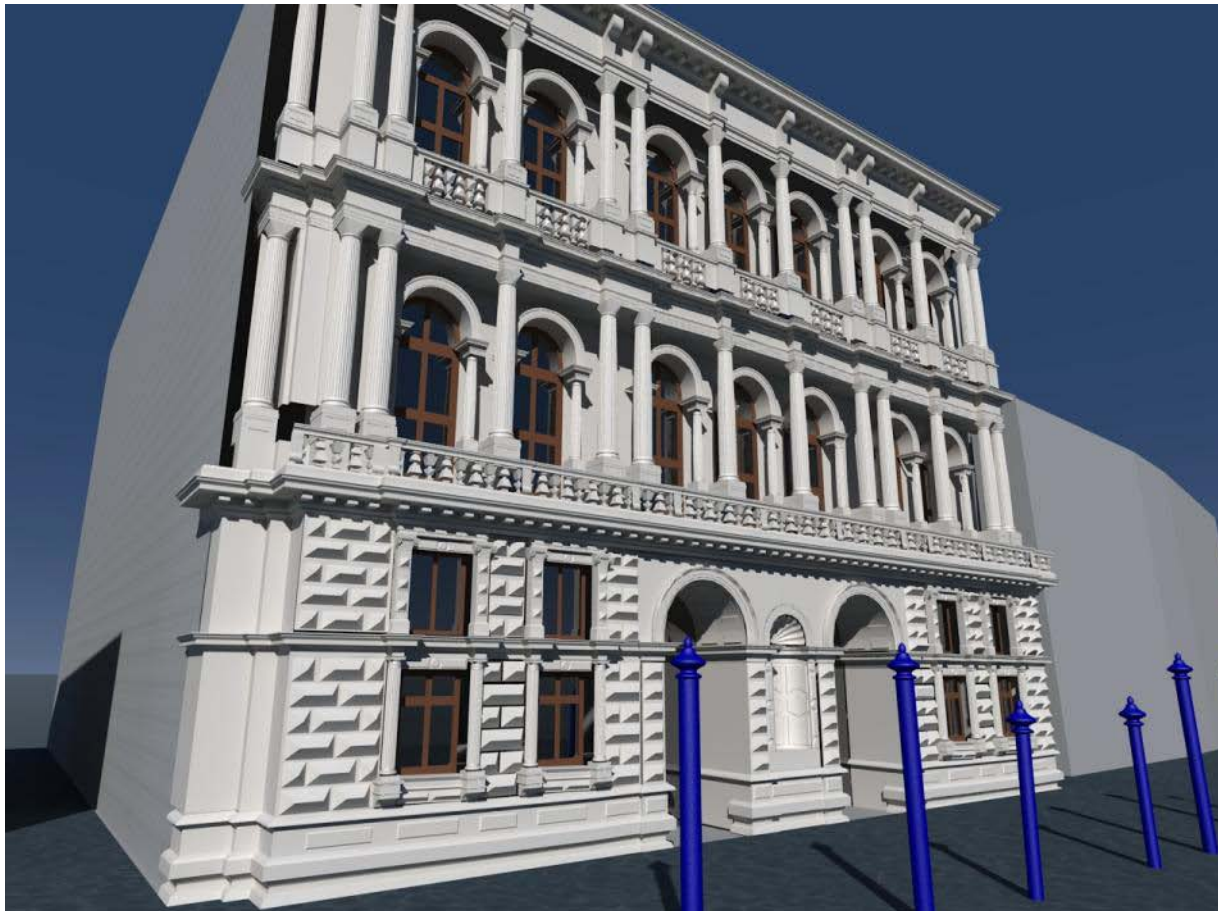
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Die Filme finden Sie auf
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