

Vermessung aus der Luft mit Unmanned Arial Vehicles (UAV's)

- ❖ Volumen- und Massenberechnung
- ❖ Erfassung von zeitlichen Veränderungen

Beispiel Volumenbestimmung der Schüttboxen auf der ehemaligen Zeche Ernestine in Essen

Orthofoto mit Paßpunkten - Auswertung mit AGISOFT-Photscan

Cameras	East est (m)	North est (m)	Alt. est (m)	Accuracy (m)	Error (m)	Yaw est (°)	Pitch est (°)	Roll est (°)
DH_0004...	32364365.343599	5704242.564551	127.396457	10.000000	0.001830	330.050	0.510	-0.736
DH_0005...	32364362.602386	5704246.152205	127.328398	10.000000	0.002267	328.969	0.719	-0.819
DH_0006...	32364359.877198	5704251.999092	127.375198	10.000000	0.001892	331.227	0.778	-0.890
DH_0007...	32364359.276440	5704224.821558	126.841704	10.000000	0.001725	330.050	0.510	-0.736
DH_0008...	32364352.963847	5704244.675582	127.274839	10.000000	0.002257	147.817	1.117	0.028
DH_0009...	32364356.657169	5704235.008897	127.676426	10.000000	0.002198	147.412	0.998	0.327
DH_0010...	32364362.163824	5704223.999925	127.296623	10.000000	0.002100	152.827	0.946	0.351
DH_0011...	32364361.669644	5704225.102041	127.869909	10.000000	0.001409	238.094	0.478	0.294
DH_0012...	32364354.238976	5704223.559231	127.700185	10.000000	0.001529	241.516	0.570	0.072
DH_0013...	32364353.985139	5704223.745572	126.831390	10.000000	0.001907	336.658	0.826	-0.450
DH_0014...	32364347.760702	5704234.928932	126.782344	10.000000	0.001969	333.213	0.702	-0.777
DH_0015...	32364341.307253	5704245.851052	126.899254	10.000000	0.002003	341.799	0.619	-0.918
DH_0016...	32364341.534548	5704245.711631	127.568048	10.000000	0.002072	240.376	0.075	-0.026
DH_0018...	32364336.091081	5704243.183571	127.853009	10.000000	0.001586	239.415	0.422	-0.178
DH_0019...	32364336.682238	5704242.998927	126.668778	10.000000	0.001535	153.116	1.111	-0.001
DH_0020...	32364340.507688	5704230.922645	127.022369	10.000000	0.001887	138.502	1.390	-0.064
DH_0021...	32364344.848359	5704225.448869	126.938893	10.000000	0.002161	127.002	1.234	-0.135
DH_0022...	32364350.132280	5704220.849523	126.768180	10.000000	0.001912	127.165	0.984	-0.215
DH_0023...	32364353.111655	5704217.011183	126.723803	10.000000	0.001722	126.981	0.936	0.000
DH_0024...	32364353.177510	5704217.470602	127.388563	10.000000	0.001742	194.674	0.747	0.292
DH_0025...	32364353.273998	5704217.267605	127.683662	10.000000	0.001984	228.285	0.722	-0.137
DH_0026...	32364348.422206	5704225.376065	126.686556	10.000000	0.001813	308.925	0.966	-1.161
DH_0027...	32364339.084440	5704236.236184	126.689178	10.000000	0.001851	305.459	0.651	-1.658
DH_0028...	32364329.444972	5704244.613439	126.793258	10.000000	0.001656	304.943	0.490	-1.522
DH_0029...	32364329.345729	5704244.798941	126.924977	10.000000	0.001875	231.543	-0.369	-0.528
DH_0030...				10.000000				
DH_0031...	32364323.557840	5704234.909348	126.662441	10.000000	0.001529	127.788	0.220	0.042
DH_0032...				10.000000				
DH_0033...				10.000000				
DH_0034...				10.000000				
DH_0035...				10.000000				

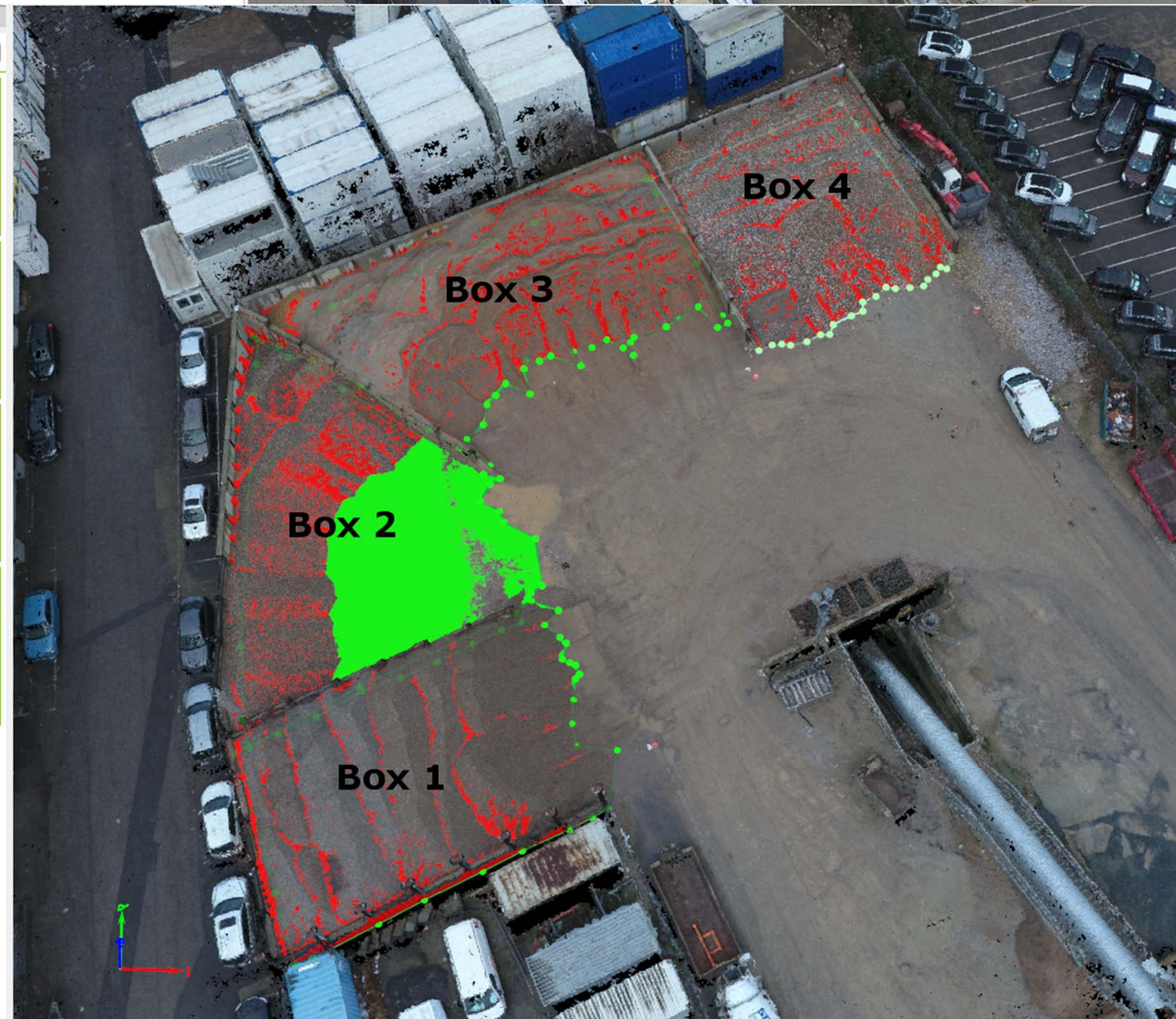
Markers	East est (m)	North est (m)	Alt. est (m)	Accuracy (m)	Error (m)	Projections	Error (pix)
412	32364324.668289	5704228.772844	81.265102	0.005000	0.020289	21	0.268
516	32364361.447678	5704249.505227	81.356258	0.005000	0.006994	26	0.319
518	32364351.270006	5704203.111181	78.042449	0.005000	0.019115	19	0.387
519	32364348.557556	5704242.459048	81.318766	0.005000	0.011624	27	0.395
521	32364334.831735	5704215.234447	77.860246	0.005000	0.007303	18	0.434
523	32364355.869763	5704227.389038	78.094125	0.005000	0.008173	19	0.321
524	32364370.325625	5704232.533750	78.079509	0.005000	0.013465	25	0.361

Total Error
Scale Bars: Distance est (m) Accuracy (m) Error (m)
Total Error
Control scale ...
Check scale b...

Koordinaten der Paßpunkte

Objekte

Objekt	3D Geländefläche	Volumen des Schnitts	Volumen der Füllung	Gesamtvolumen
Box 1	351.33 m ²	482.78 ± 5.74 m ³	-0.03 ± 0.03 m ³	482.75 ± 5.77 m ³
Box 2	388.97 m ²	211.74 ± 3.83 m ³	-17.85 ± 3.29 m ³	193.89 ± 7.12 m ³
Box 3	457.01 m ²	620.29 ± 6.94 m ³	-0.05 ± 0.04 m ³	620.25 ± 6.98 m ³
Box 4	357.66 m ²	512.65 ± 5.97 m ³	-0.00 ± 0.01 m ³	512.65 ± 5.98 m ³



Berechnung der Volumen der Schüttboxen durch Schnitt mit einer Ebenen