

38 v archeologii aneb teorie tam

a

praxe zpátky



3D Я ПТРДНЛАЛПШ ПУНН РНАТН РНБ П РТНКН ЛРНМН



3D Я ПТРДНЛАЛПШ ПУНН РНАТН РНБ П РТНКН ЛРНМН

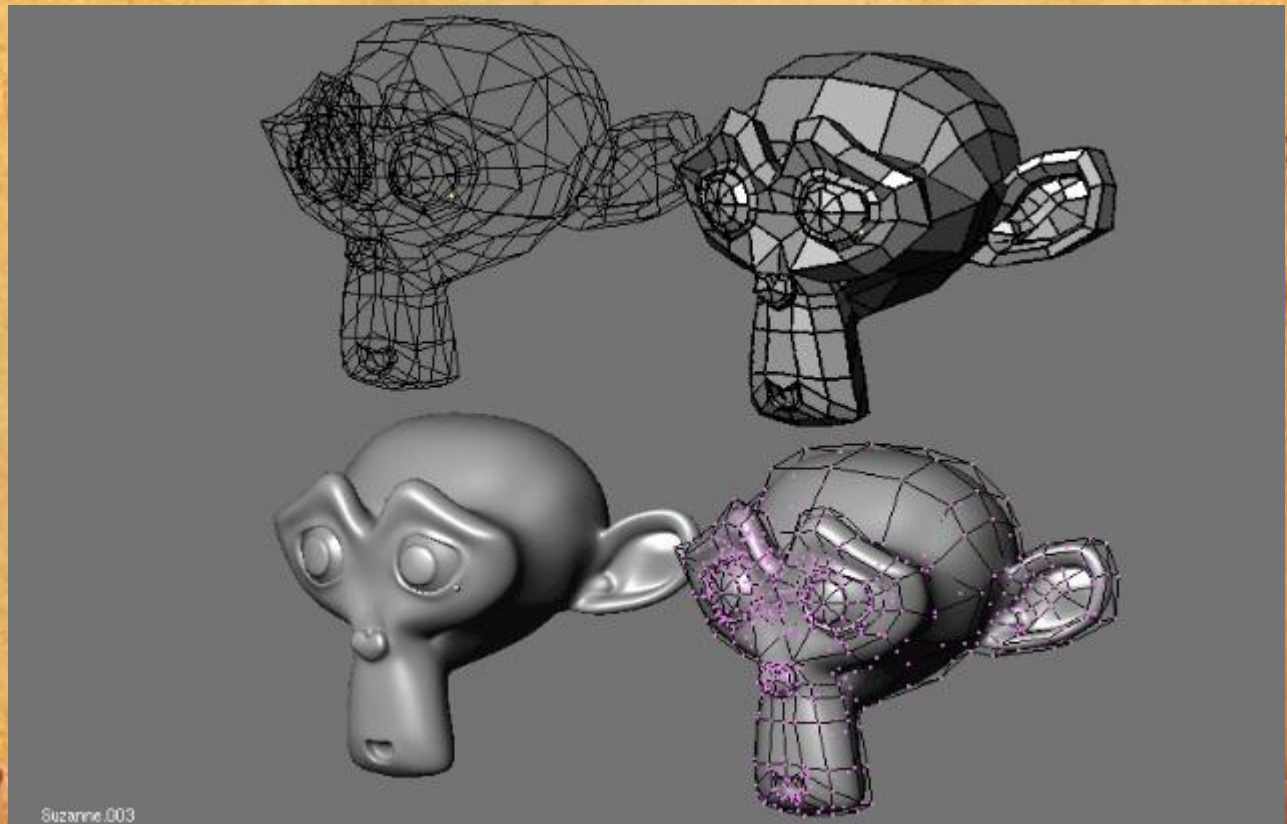
Osnova prezentace

- Něco málo o 3D modelech
- 3D fotogrammetrie a 3D skenery
- Aplikace 3D záznamu reality v archeologii
- Diskuze

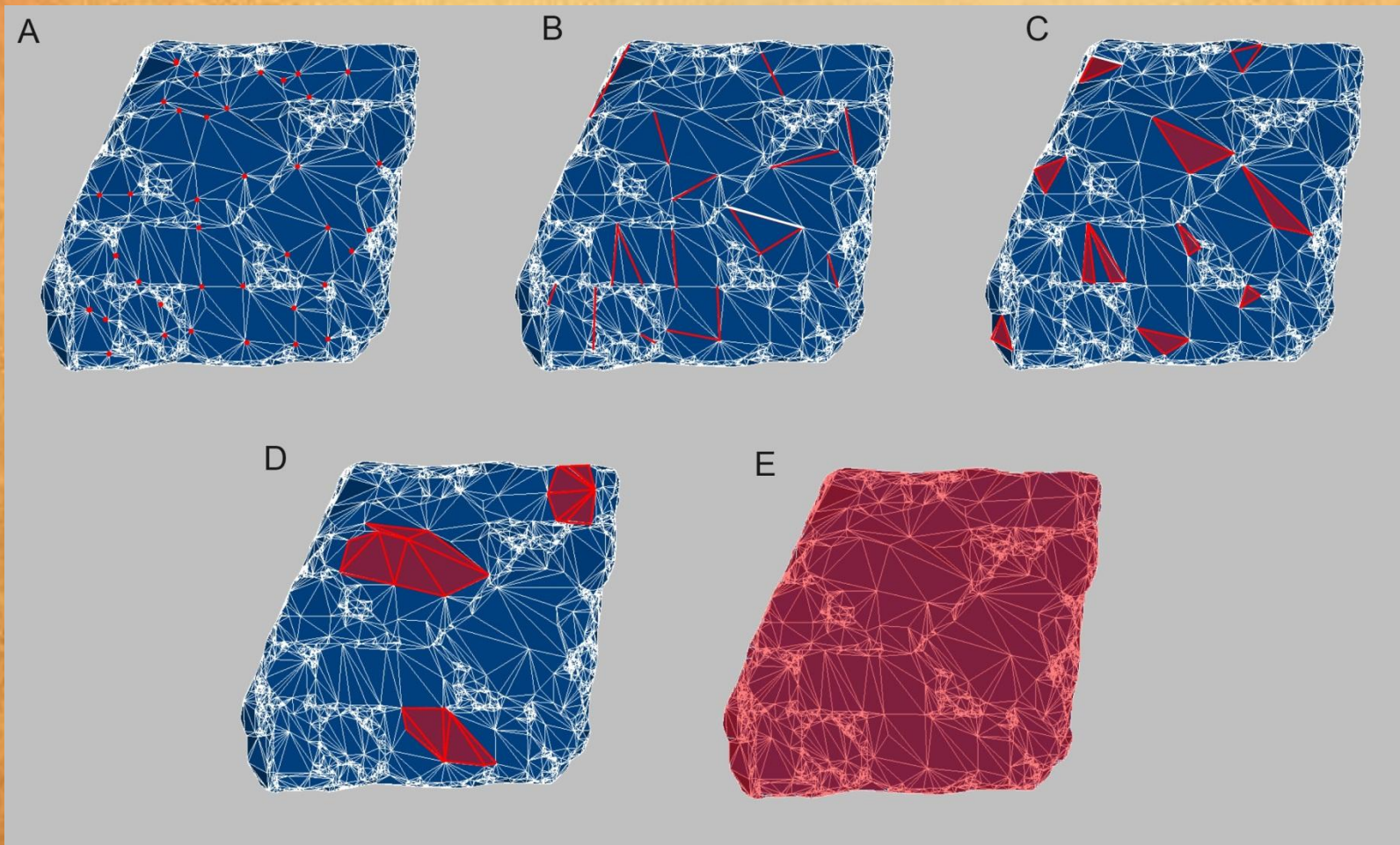
3D Model

- Virtuální trojrozměrný objekt nesoucí fyzickou i grafickou informaci o své reálné předloze.

- Drátěný
- Bodový
- Stínovaný
- Kombinace



Struktura polygonální sítě



A – body (points) B – hrany (edges) C – plochy (faces) D – polygony E- povrch (surface)

3D ԿՈՒՐԾՈՒԹՅԱՆ ՈՒՄԻՆ ՄԱՆԻՆ ՄՈՅ ՈՐՈՒՄԻՆ ԱՐՈՒՄԻՆ

Textura

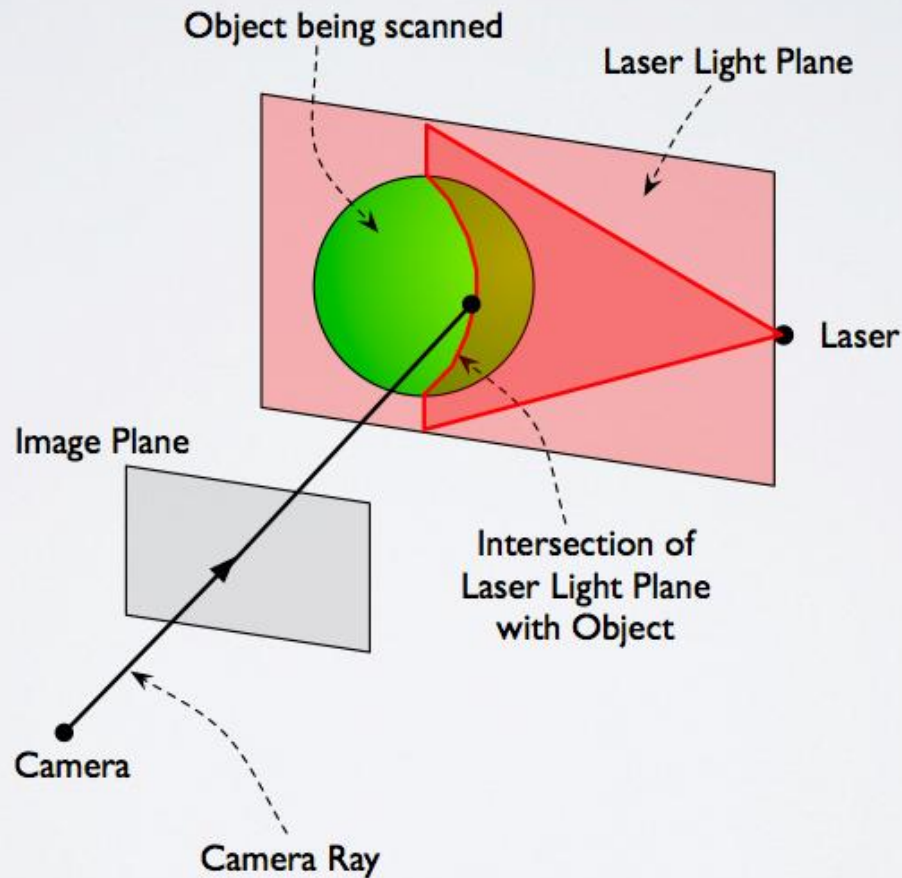


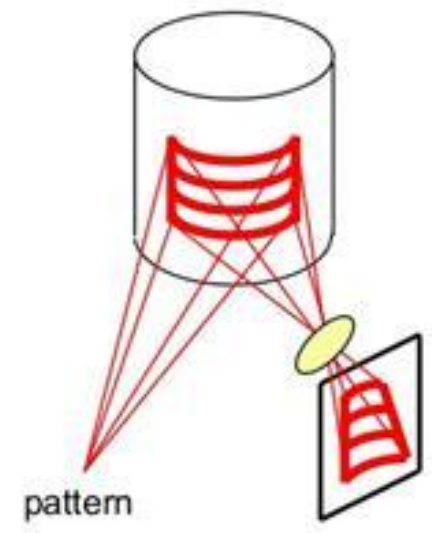
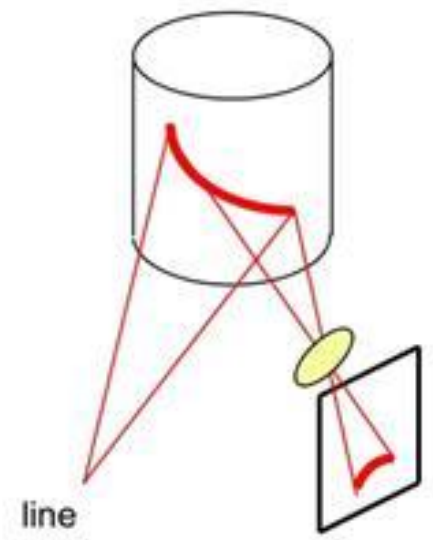
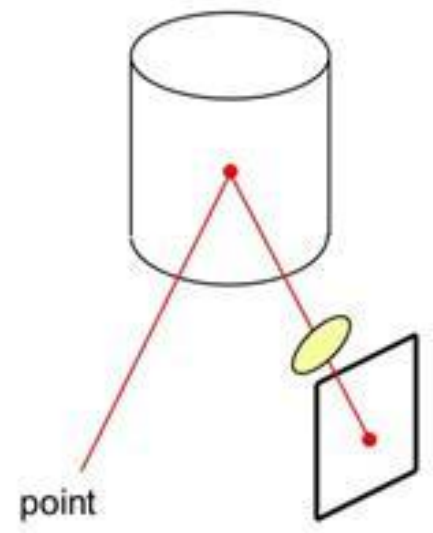
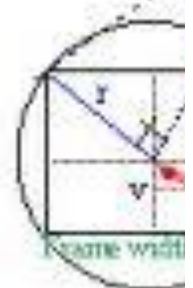
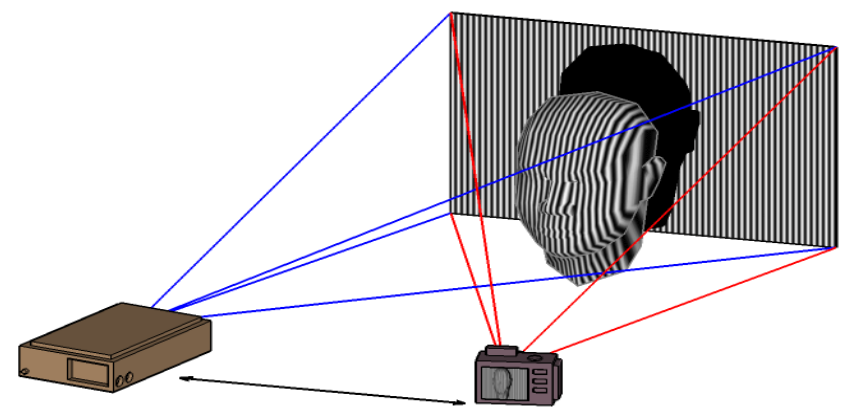
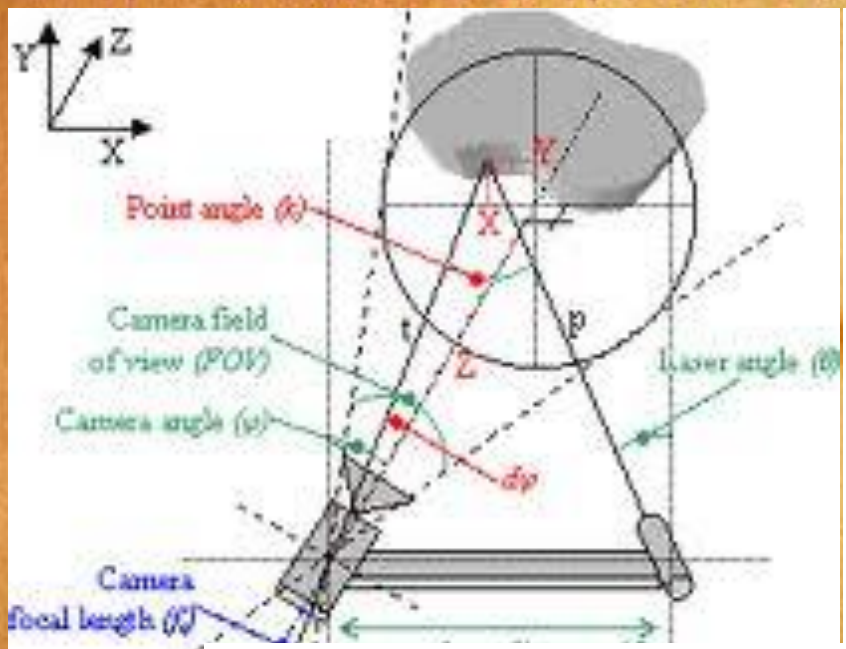
3D ԿՈՒՐԾՈՒԹՅԱՆ ՈՒՄԻՆ ՄԱՆԻՆ ՄՈՅ ՈՐՈՒՄԻՆ ԱՐՈՒՄԻՆ

Trojrozměrné skenování

- Triangulační metoda, měření z konců známé základny.
- Jedna kamera a jeden laser na opačných koncích základny, snímá se stopa laseru/světla po objektu.
- Dvě kamery na známých pozicích základny a jeden laser/projektor. Objekt se nasvětluje strukturovaným světlem, nebo se snímá stopa laseru.

BASICS OF TRIANGULATION



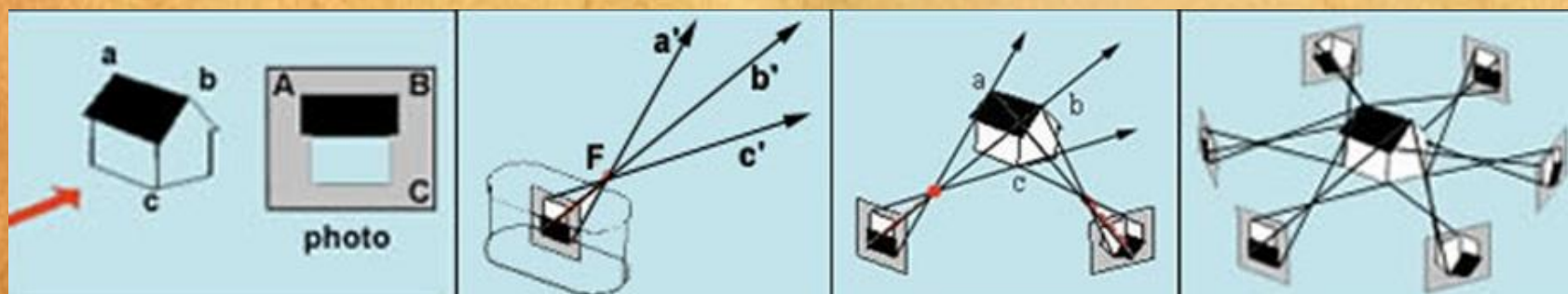


38 Я ПТФ>НЛЛЛЛПН ПУНН ННЛЛНН ННБ П ПТНПКН ЛРННПН

- Ruční i stolní skenery.
- Přesné, ale časově náročné. Nevýhodou také nižší přesnost s rostoucí měřenou délkou a také omezená délka základny mezi kamerou a vysílačem.
- U velké části skenerů je také obtíž s pořízením textury.

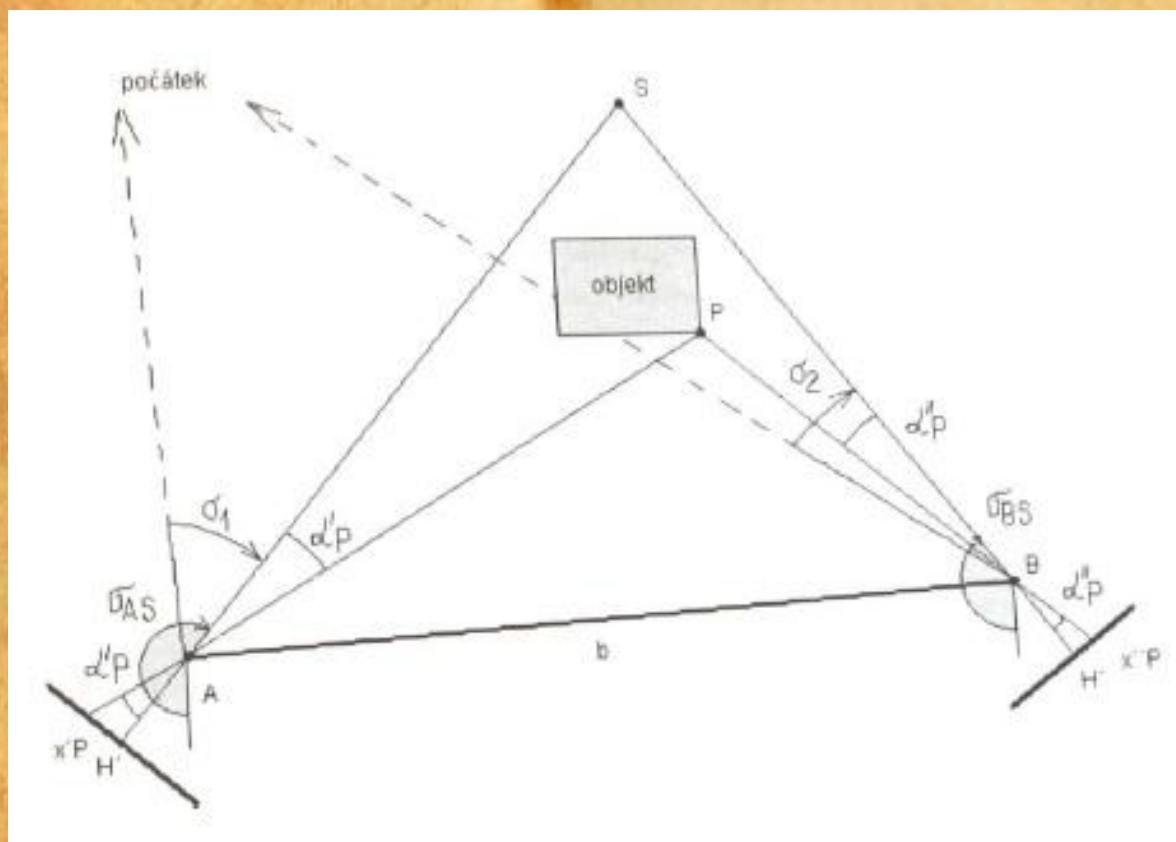
38 Я ПТФ>НЛЛЛЛПН ПУНН ННЛЛНН ННБ П ПТНПКН ЛРННПН

Trojrozměrná fotogrammetrie

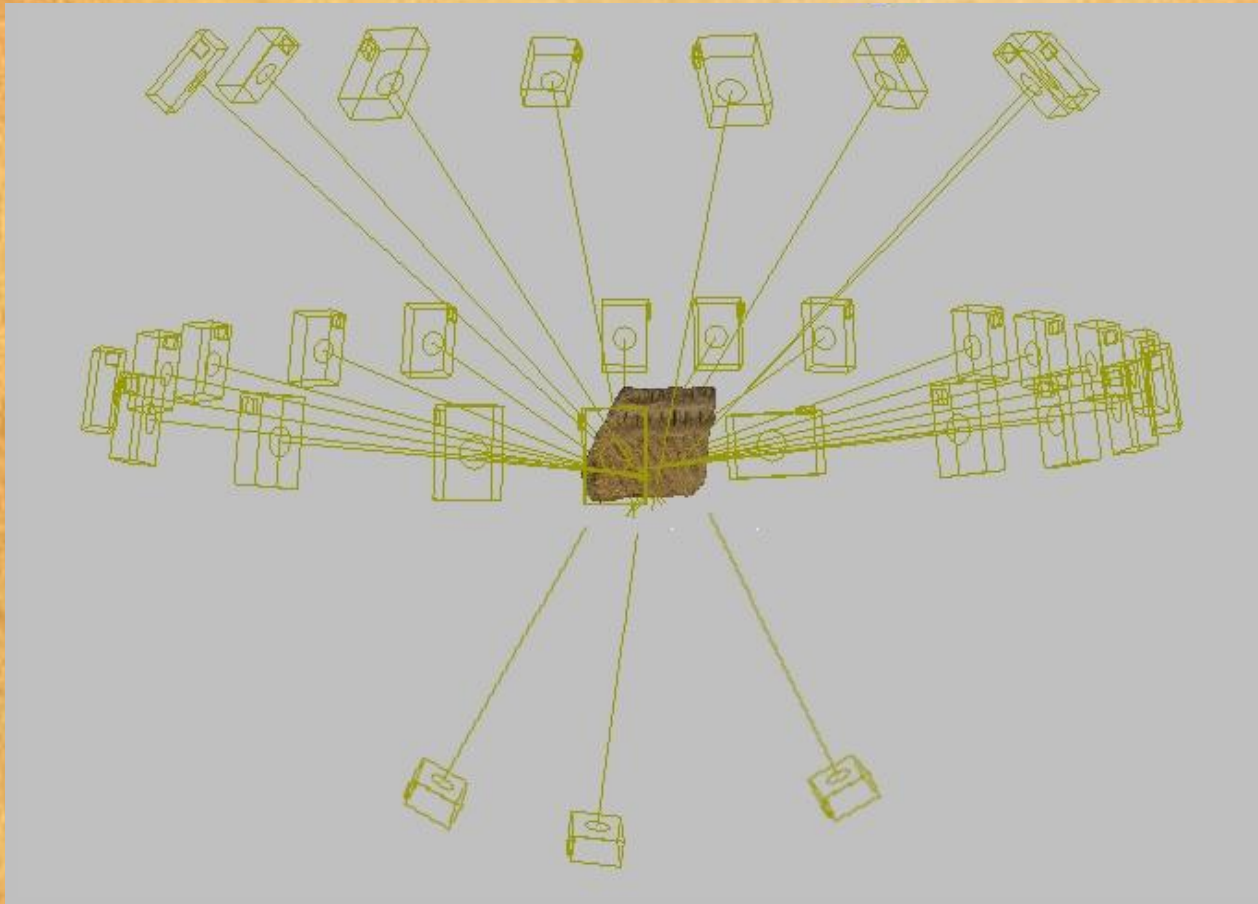


Průseková fotogrammetrie

- Jeden z nejjednodušších způsobů.

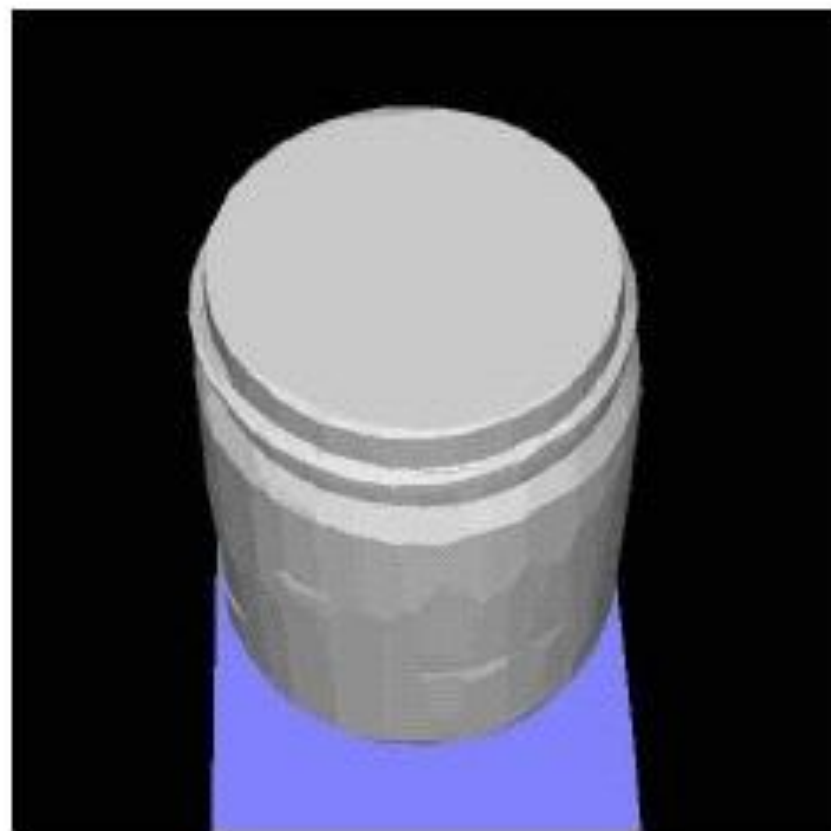
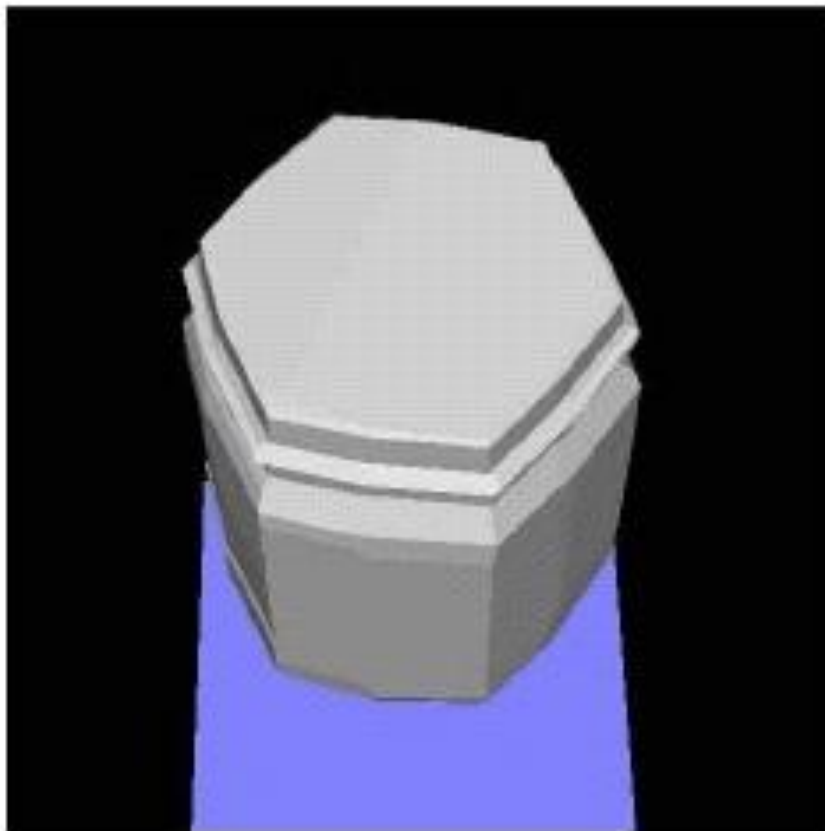


- Pokrytí celého povrchu artefaktu měřičskými snímky. Více úhlů a elevací, víc vidí.



3E Я ПТФ>НЛЛЛШП ПУНН ТНАТН ТНБ П РТНПКН ЛРННПН

Tvar prostřednictvím siluety



3E Я ПТФ>НЛЛЛШП ПУНН ТНАТН ТНБ П РТНПКН ЛРННПН

3Բ Յ ՈՒՄՉԻԱԿԱՄԻ ՈՄԻՔ ԻՆԱՒԻՆ ԻՈՅ Ո ՔՏՈՔԻՆ ԼՐՈՒՄԻ

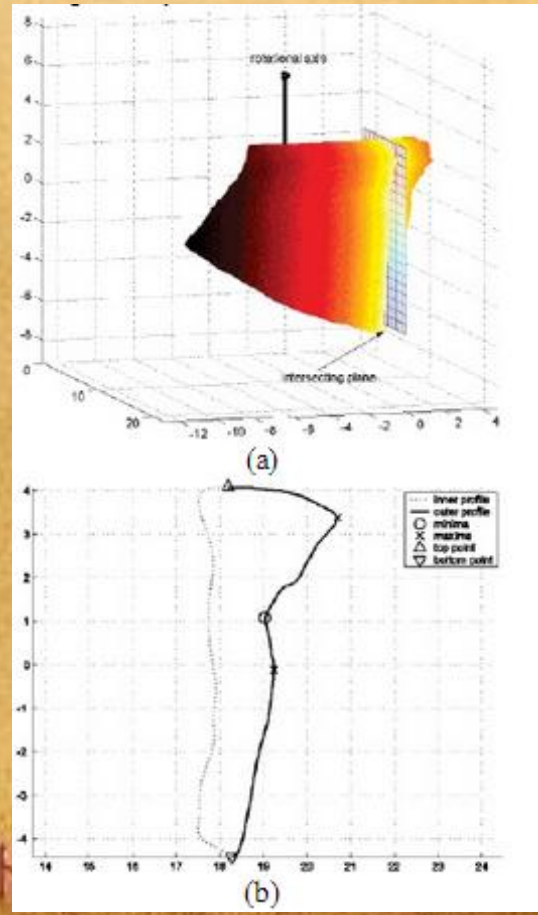
Tomograf

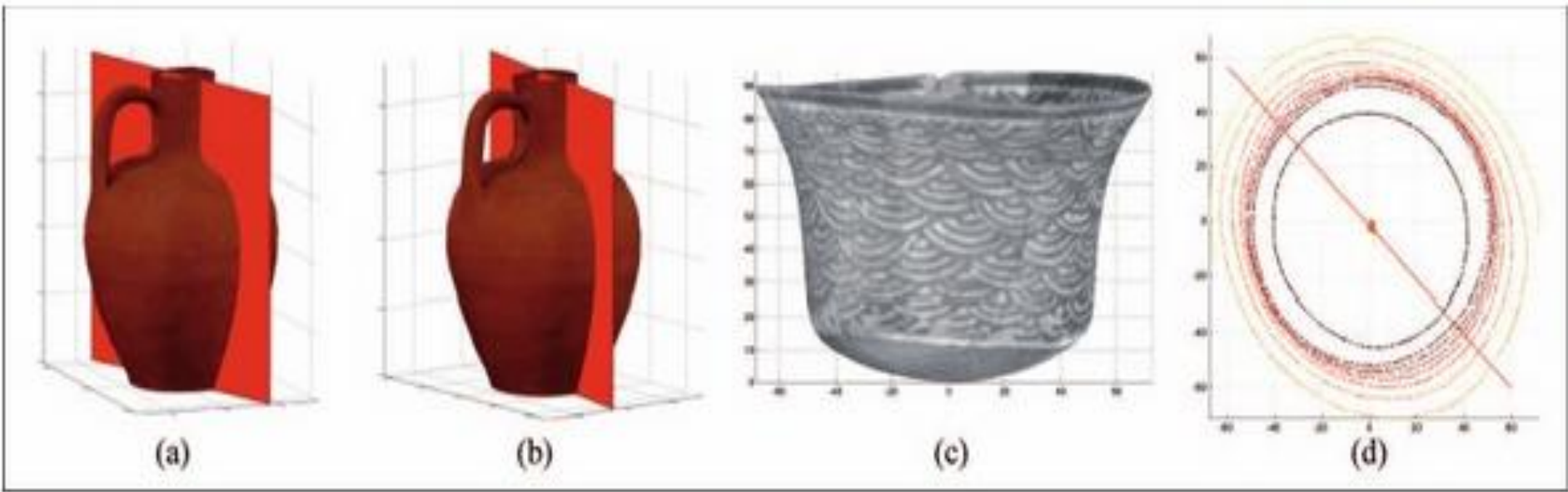
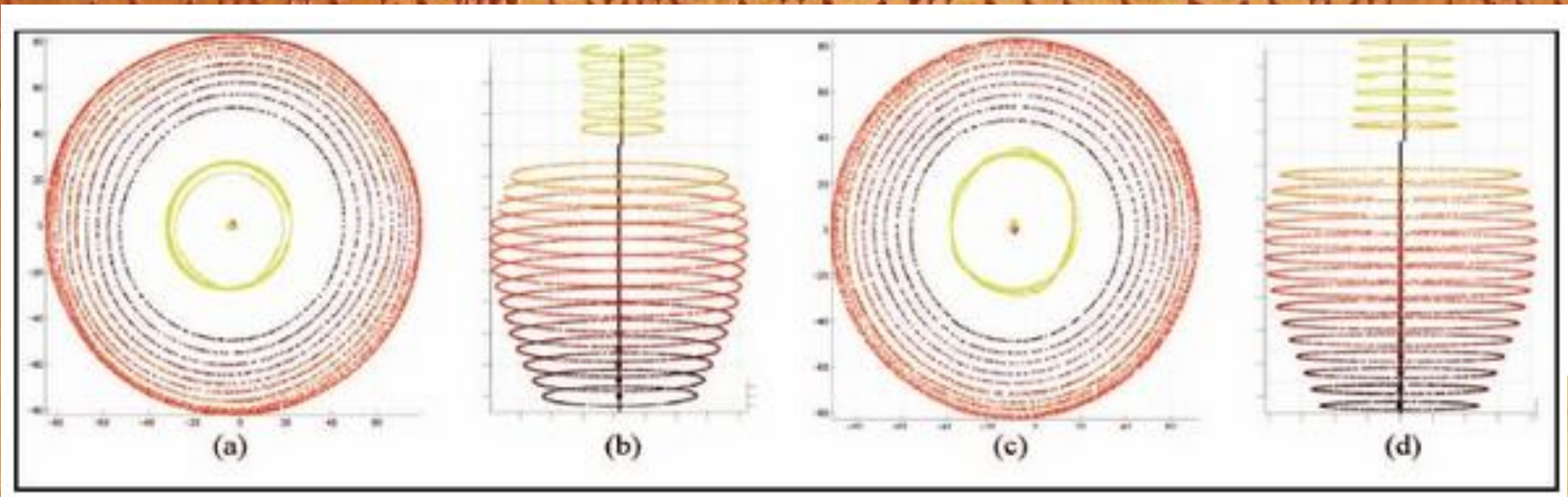


3Բ Յ ՈՒՄՉԻԱԿԱՄԻ ՈՄԻՔ ԻՆԱՒԻՆ ԻՈՅ Ո ՔՏՈՔԻՆ ԼՐՈՒՄԻ

Rekonstrukce

- Keramické fragmenty – spíše až od aplikace vytáčené techniky.





3P Я ПТТД>НЛЛЛЛЛ

Rek

7 PТТКН ЛРПТТН

oby

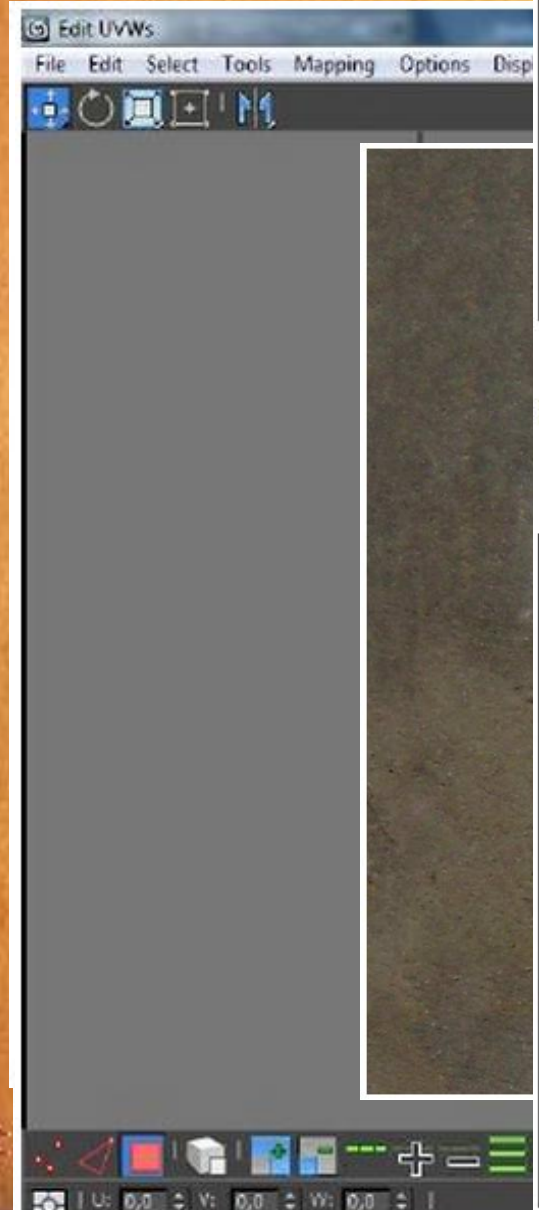


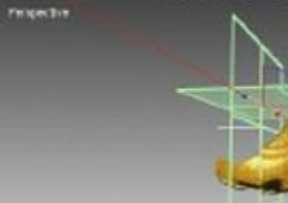
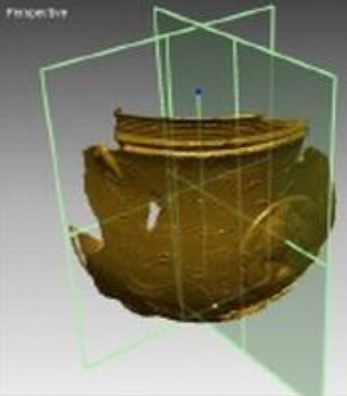
Fig. 7 - The reconstructed pot. View from above.



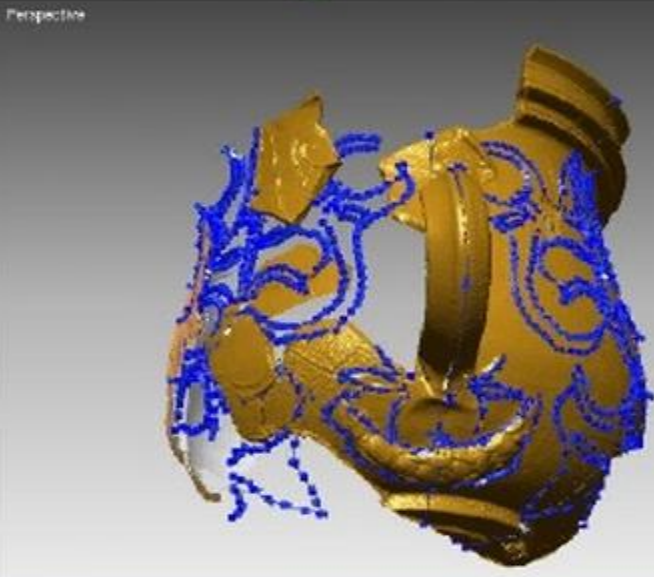
ԻՆԱՒԻՆ ԻՈՅ Ո ՐԻՈՐԿԻ ԱՐՈՒՄԻ



Perspective



- * Small Angle : 89.25440
- * Large Angle : 90.74560
- * Normal of Plane 1 (Red)
- * Normal of Plane 2 (Blue)



ԻՆԱՒԻՆ ԻՈՅ Ո ՐԻՈՐԿԻ ԱՐՈՒՄԻ

3F ጸ ስጥጥር ዘለገለገህ ስሃድ ገደለገዝ ገደብ ስ ገገገገ ገገገገ

CT (Computed Tomography)



(a)



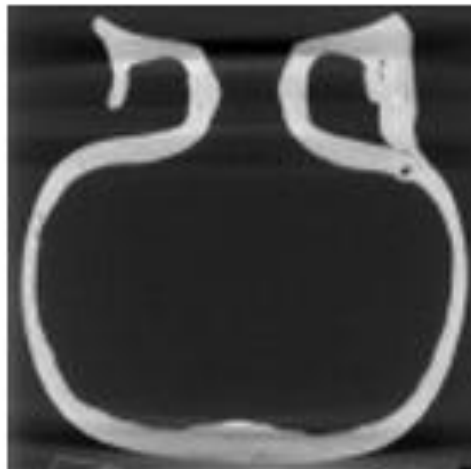
(b)



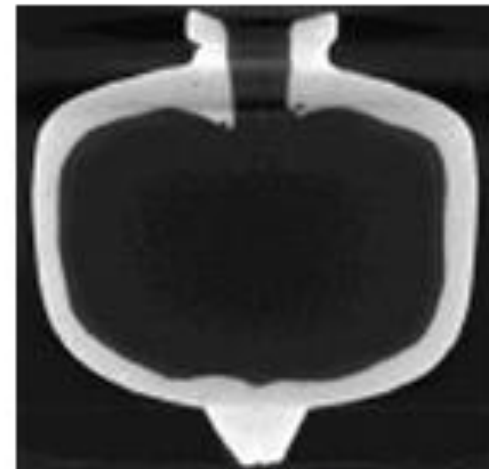
(c)



(d)



(e)



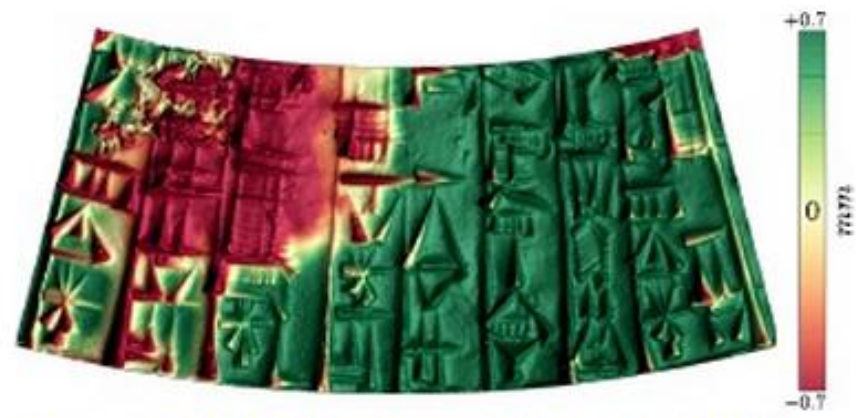
(f)

3P A NTPDHALAPU NYHR MHALTH MBE N PTPKCH APRNPH

Wrap Method



(a) Illuminated 3D model



(b) Distances between the cone and the 3D model, unwrapped model, and color ramp.



(c) MSII filter responses, unwrapped model without virtual illumination, and grayscale ramp.

3P A NTPDHALAPU NYHR MHALTH MBE N PTPKCH APRNPH

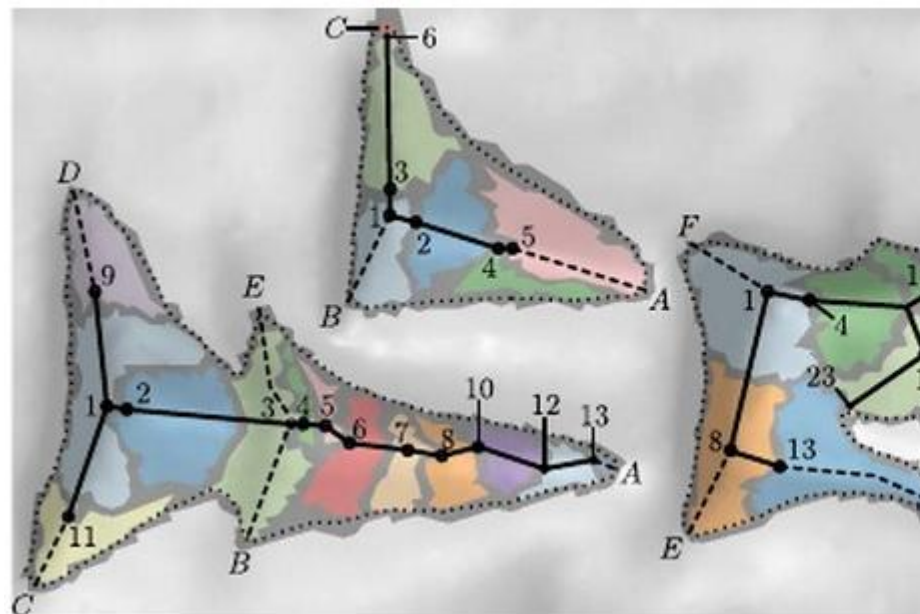


Fig. 3. 3D-model without illumination using the correlation with a reference vector mapped to a gray-scale.

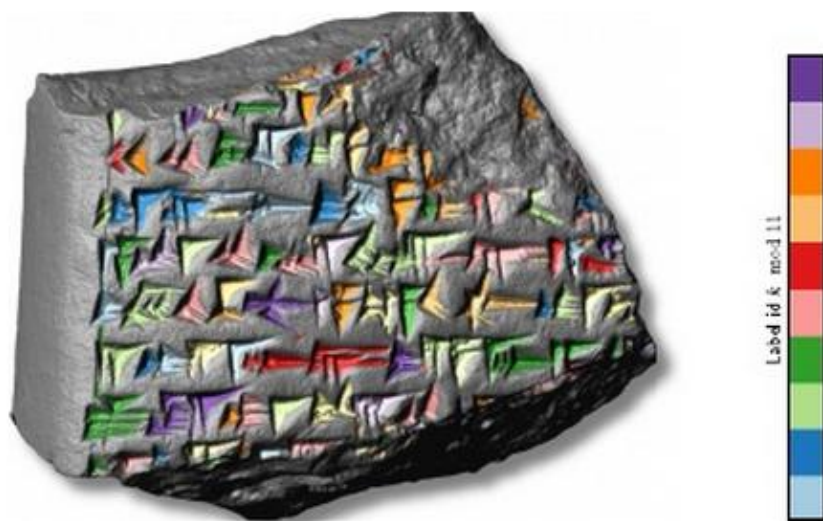
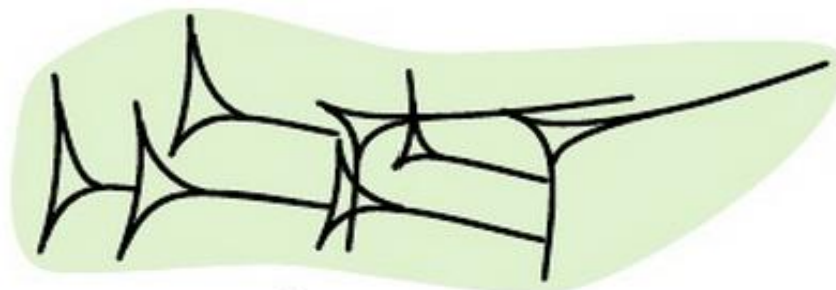


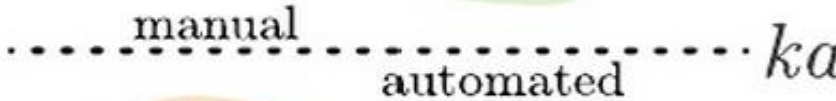
Fig. 4. Intermediate state of the 3D-model with connected components i.e. labeled characters.



photograph

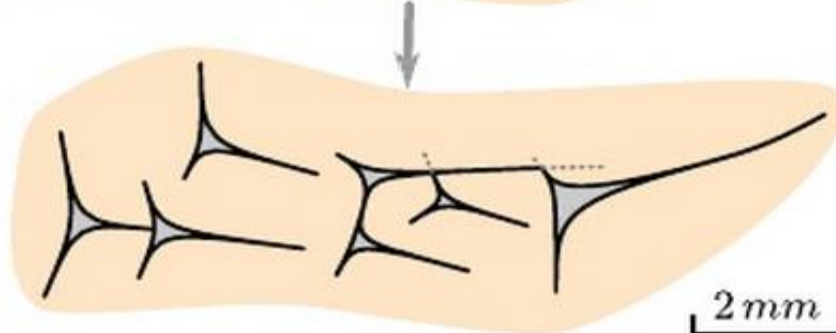
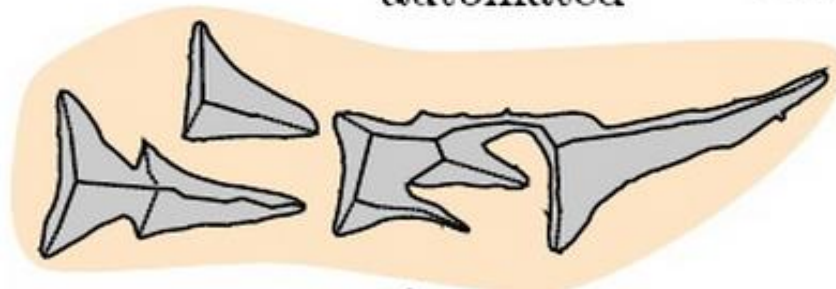


manual



automated

ka



2 mm

Deskripce a Hypotézy

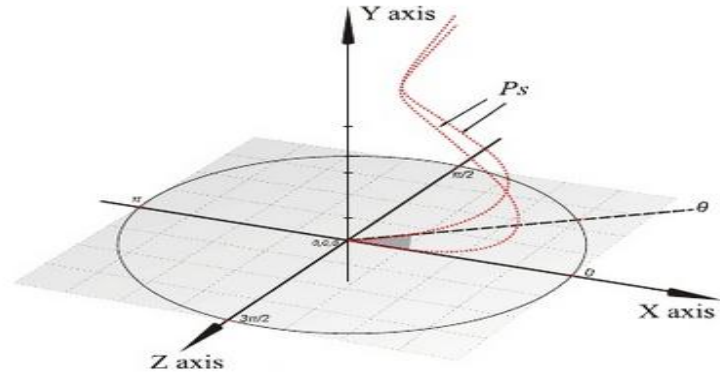
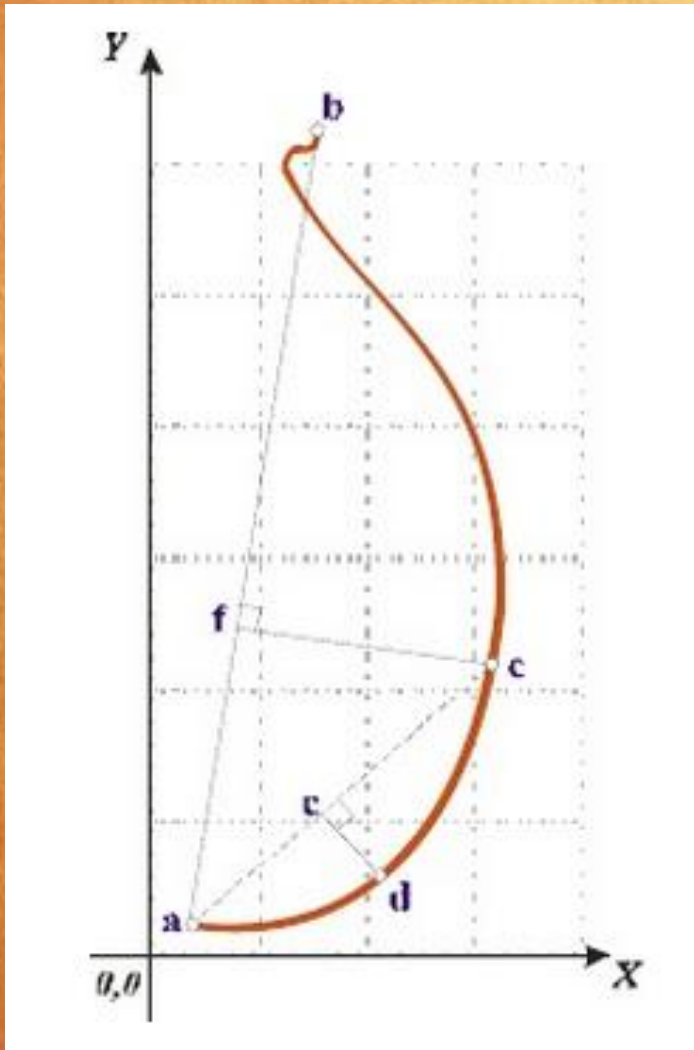


Figure 10 - Generation of Vessel's main body using the Revolve technique

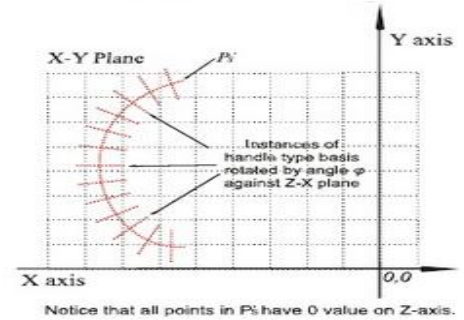
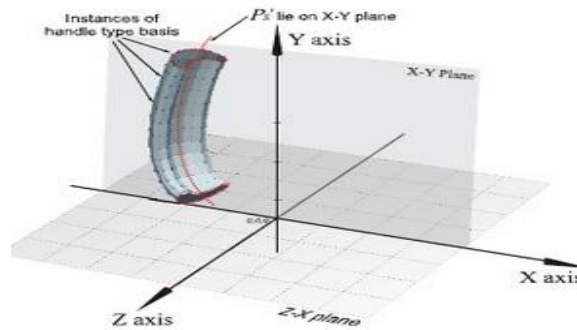
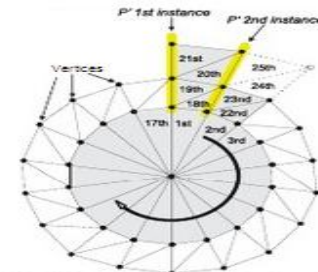


Figure 11 - Extrude along Path technique is used for the generation of a concave type handle



A. Front View of an 's' type vessel



B. Partial Bottom View of the same Vessel

Figure 12 - Triangulation algorithm

Deskripce a Hypotézy

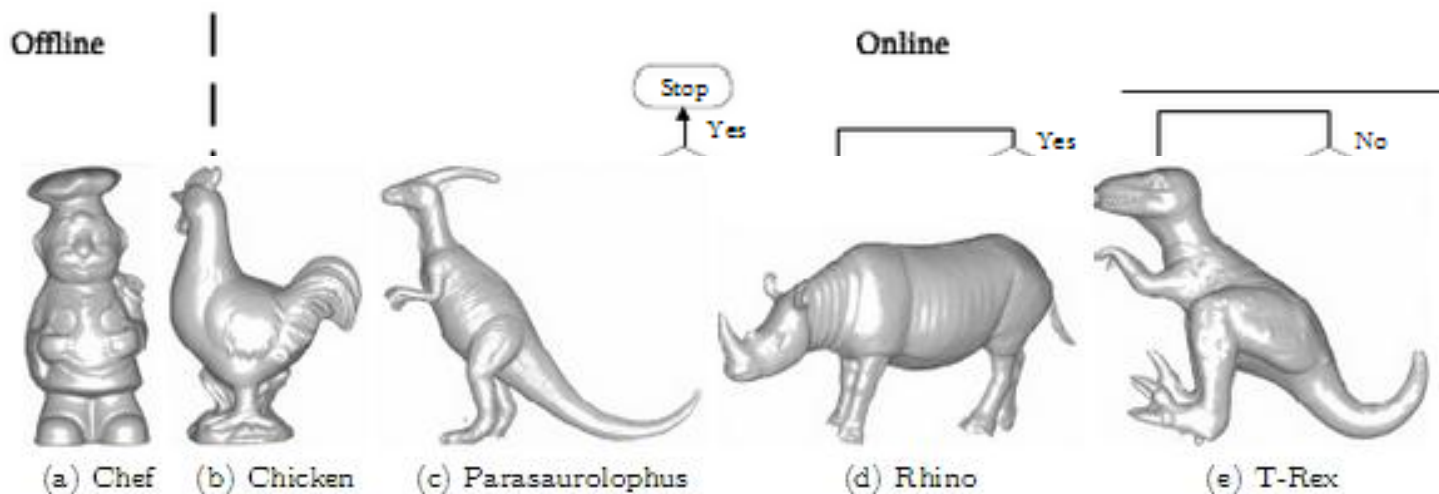


Fig. 12: The five models of the UWA Dataset.

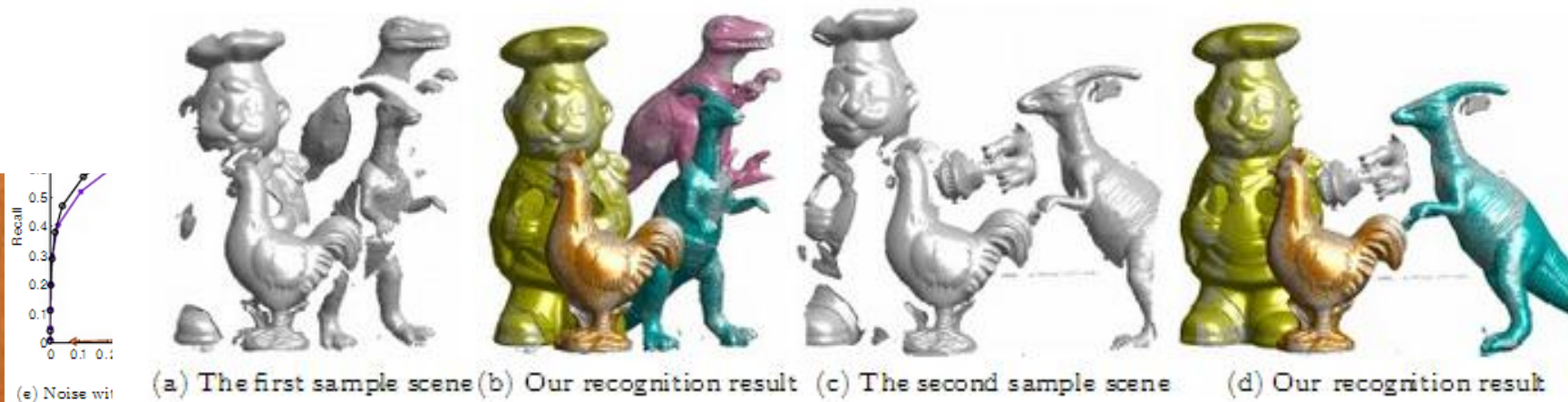
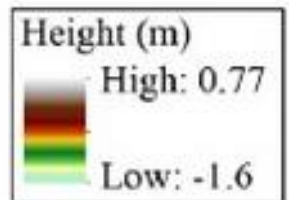
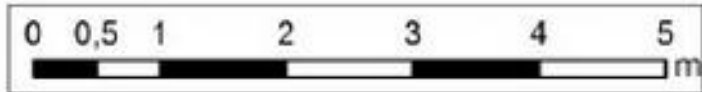


Fig. 8: Recall vs 1-Precision curves in the presence of noise. (Figure best seen in color.)



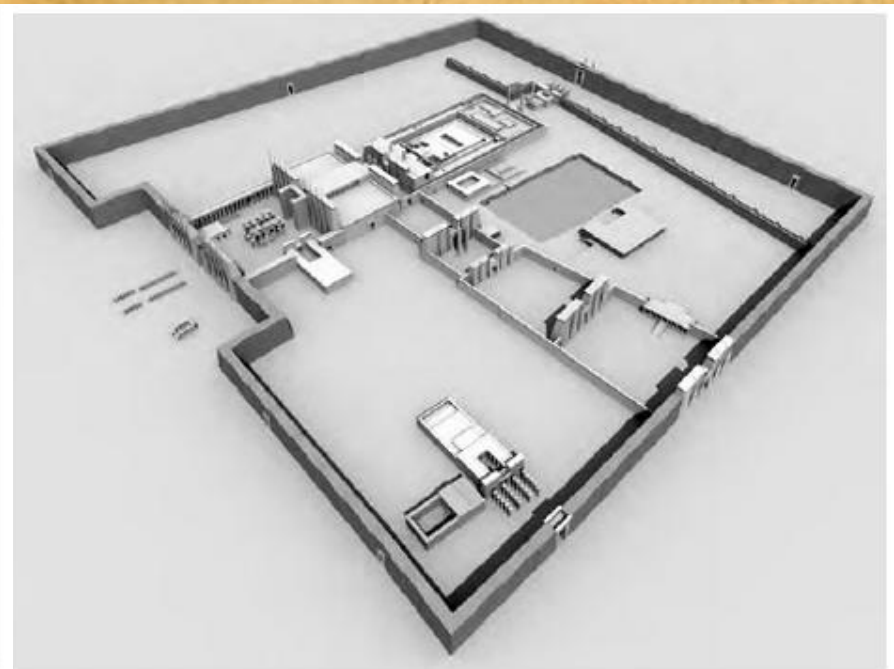
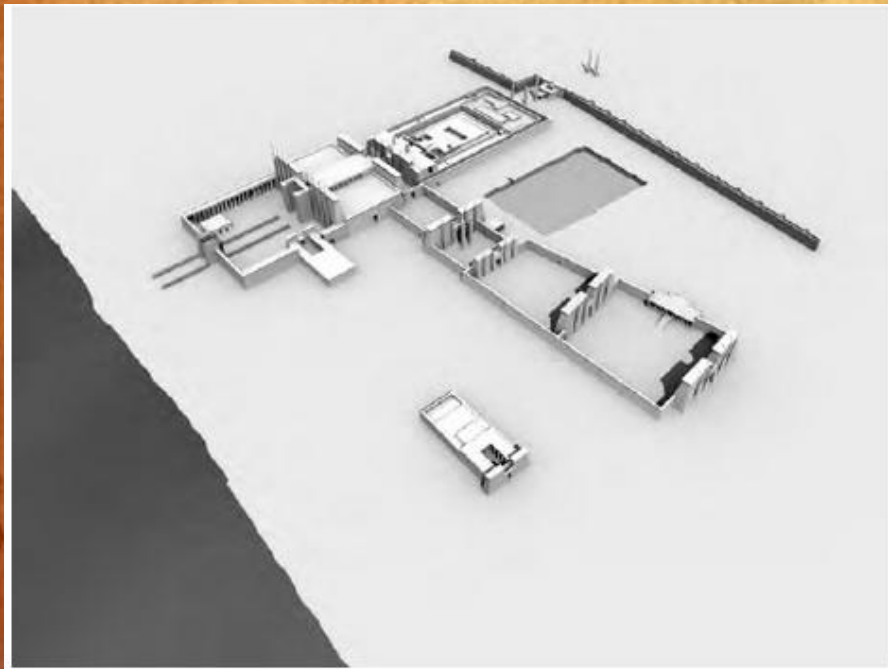
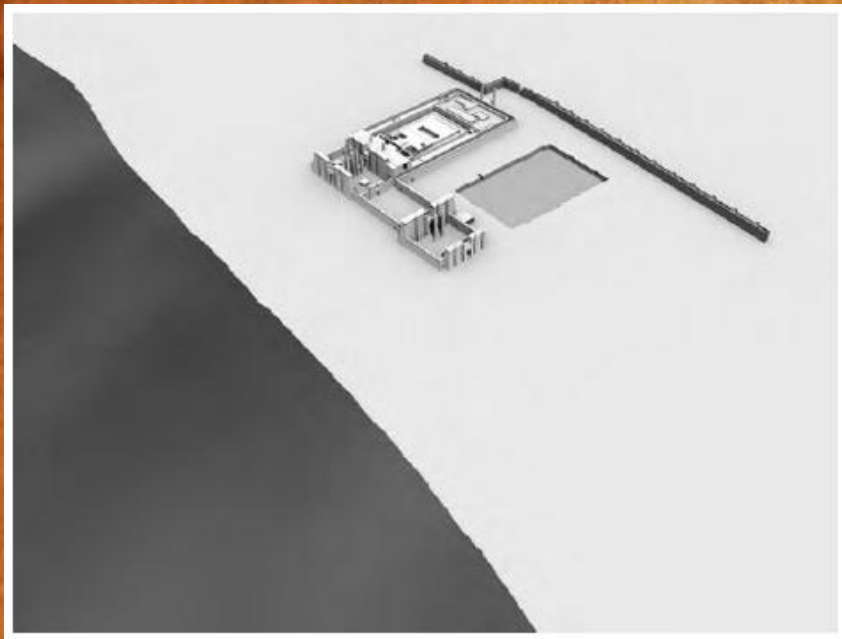
★ GCPs



onstrukce

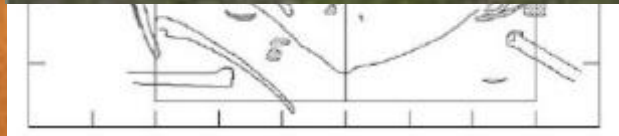


<http://google-sketchup.cs.softonic.com/>



38 Я ПТФДНЛЛЛЛЛЛ ПУНН РНЛЛНН РНН П РТНННН ЛРНННН

Rekonstrukce a konstrukce

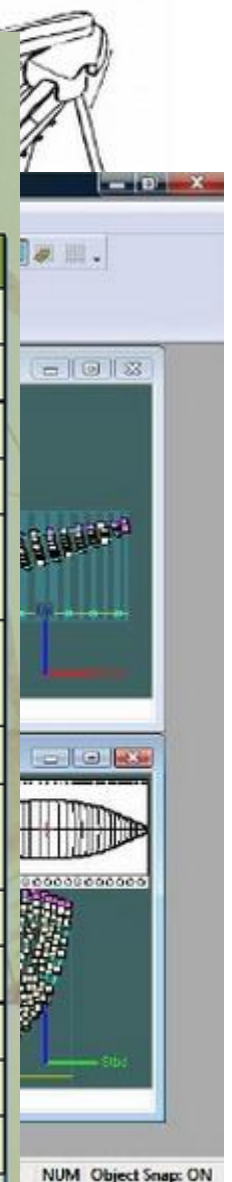


38 Я ПТФДНЛЛЛЛЛЛ ПУНН РНЛЛНН РНН П РТНННН ЛРНННН

3D Reconstruction of the hull.

Hydrostatics. Fresh water 1,000 tonne/m³

Characteristics	Notation	Value	Unit
Wetted Surface Area	WSA	133.32	m ²
Water Plane Area	WPA	120.60	m ²
Displacement	Δ	100.6	ton
Deadweight	DW	≈50	ton
Longitudinal centre of flotation. From zero point (+ve fwd).	LCF	0.115	m
Longitudinal centre of buoyancy. From zero point (+ve fwd).	LCB	-0.067	m
Keel buoyancy (vertical distance to VCB)	KB	0.701	m
Keel gravity (distance from the baseline to the vessels's VCG).	KG	1.200	m
Transverse metacentric height	GMt	4.116	m
Transverse metacenter	KMt	5.316	m
Longitudinal metacenter values	KML	29.440	m
Immersion	TPc	1.206	tonne/cm
Moment to change trim one cm	MTc	1.577	tonne.m





Digital Technologies for Research in
MAYA ARCHAEOLOGY

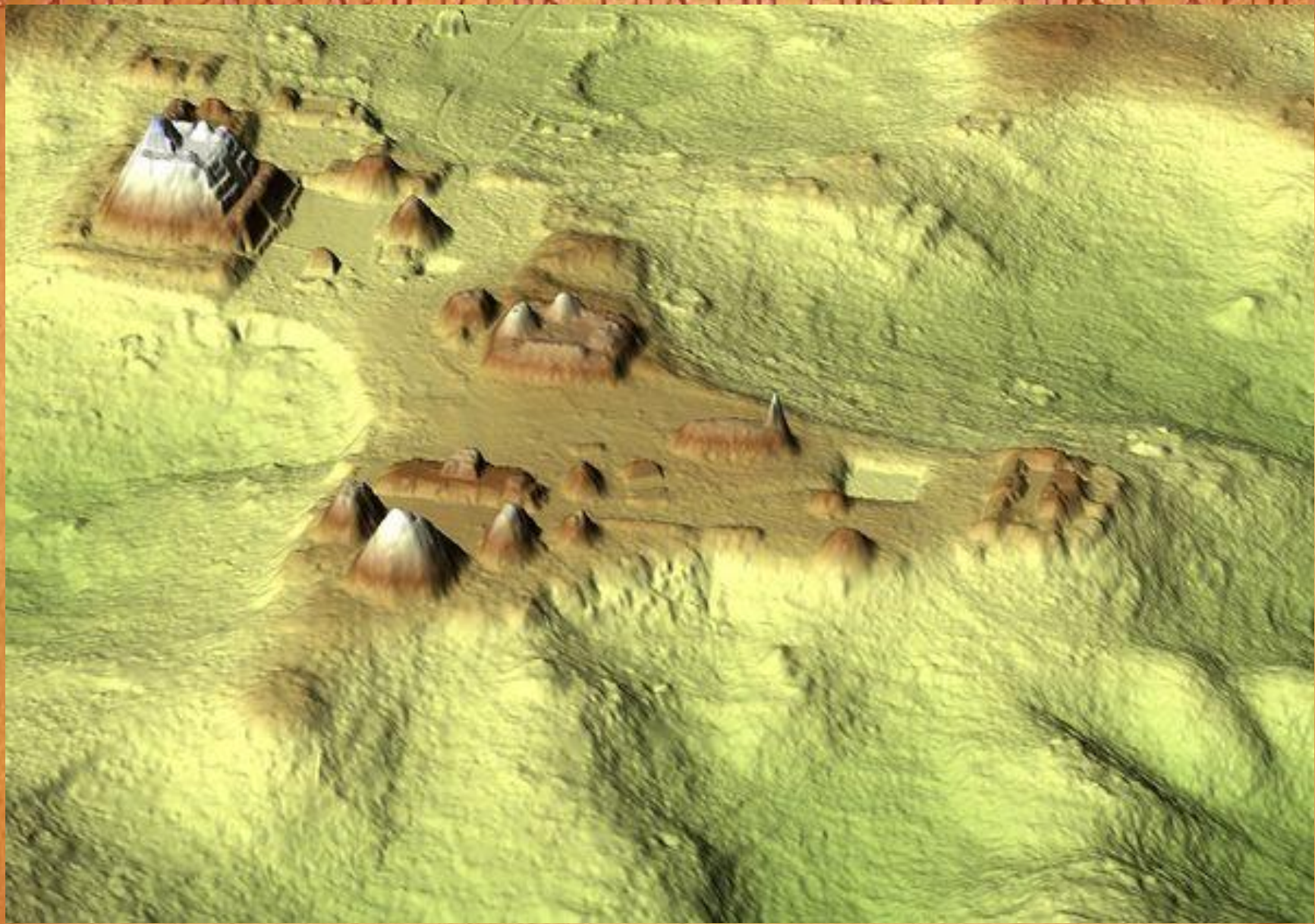
**The MayaArch3D Project:
Digital Technologies for Research in Maya Archaeology**

Authors:

Jennifer von Schwerin, Heather Richards-Rissetto, Fabio Remondino, Giorgio Agugiaro,
Maurizio Forte, Raul Maqueda

Contact: maya3d@unm.edu

38 Я ПТЪЗНАЛЪЛШН ПУНН РНАТН ННН П РТНУКН ЛРННН



38 Я ПТЪЗНАЛЪЛШН ПУНН РНАТН ННН П РТНУКН ЛРННН

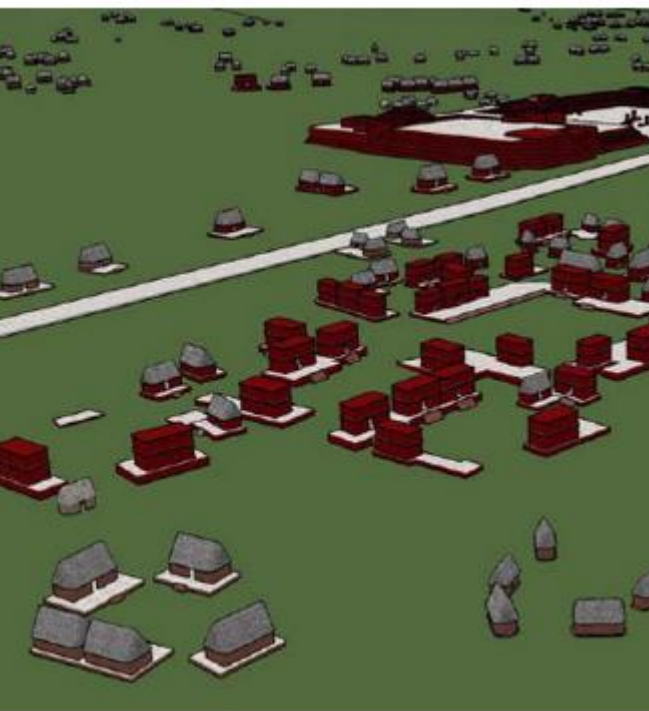


Figure 21. Virtual Reality Environment (work in progress)—View facing northeast of urban core

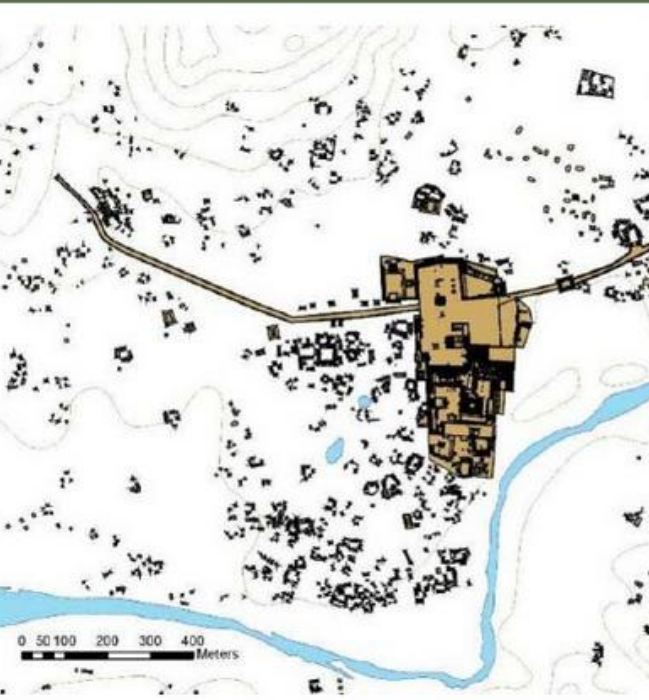


Figure 22. Virtual Reality Environment—View facing north and overlooking Principal Group

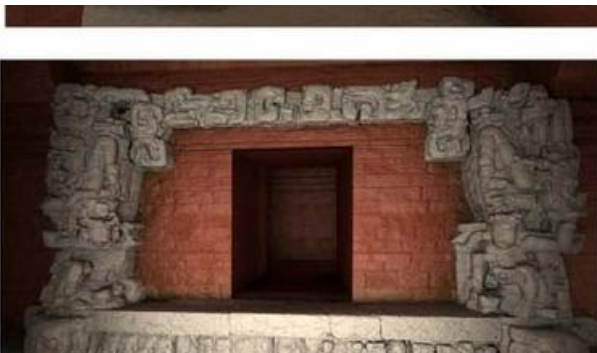
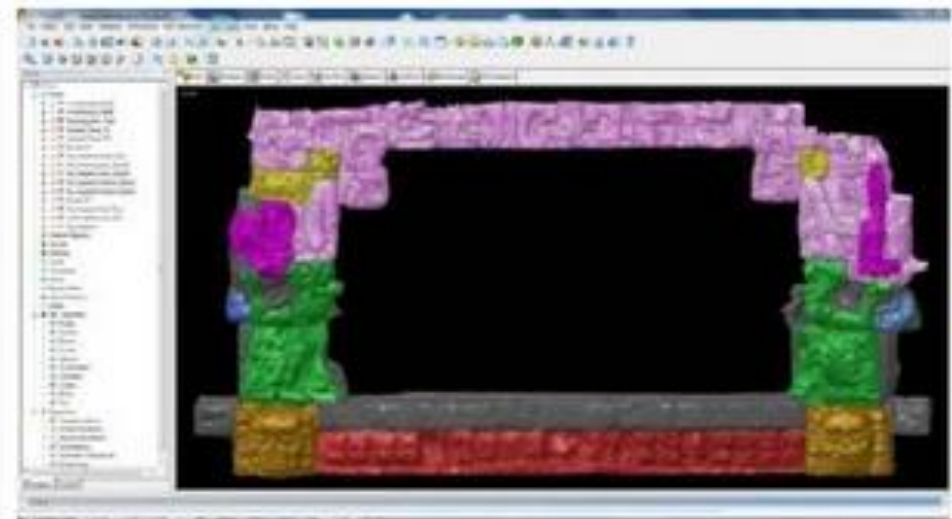
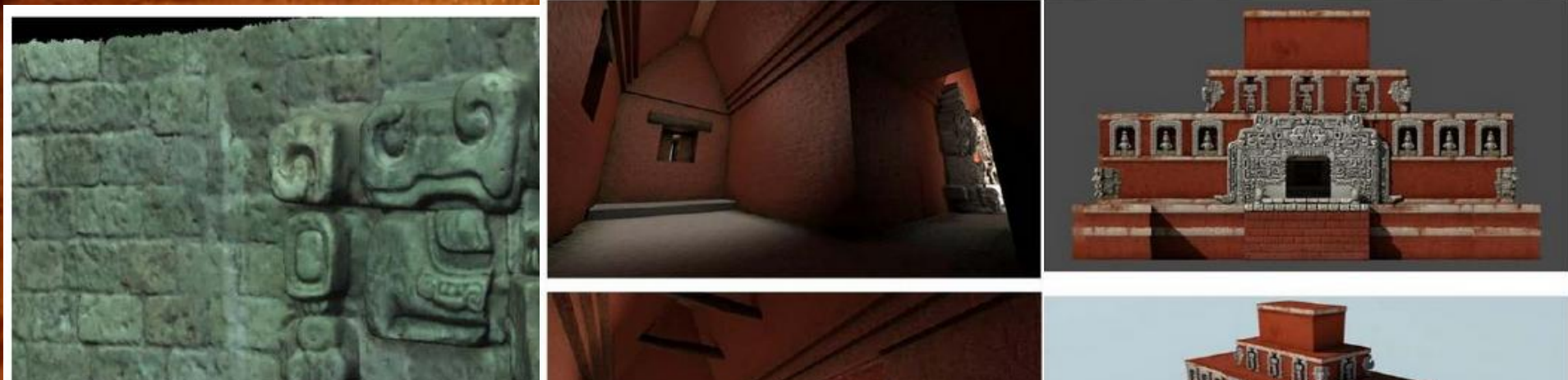


Figure 10: Temple 22 3D models. With (right) ar

3D model of upper levels from laser scanning data.

- <http://portal.med.muni.cz/clanek-569-vyukovy-atlas-zubu-cloveka.html>
- http://www.britishmuseum.org/explore/galleries/ancient_egypt/room_61_tomb-chapel_nebamun/nebamun_animation.aspx
- <http://humanorigins.si.edu/evidence/3d-collection>
- <https://www.youtube.com/watch?v=h5U-TH7KIOU>

38 Я ПТФ>НЛЛЛПШ ПУНН РНАТН РНЕ П РТНПКН ЛРННМН

Děkuji za pozornost



38 Я ПТФ>НЛЛЛПШ ПУНН РНАТН РНЕ П РТНПКН ЛРННМН