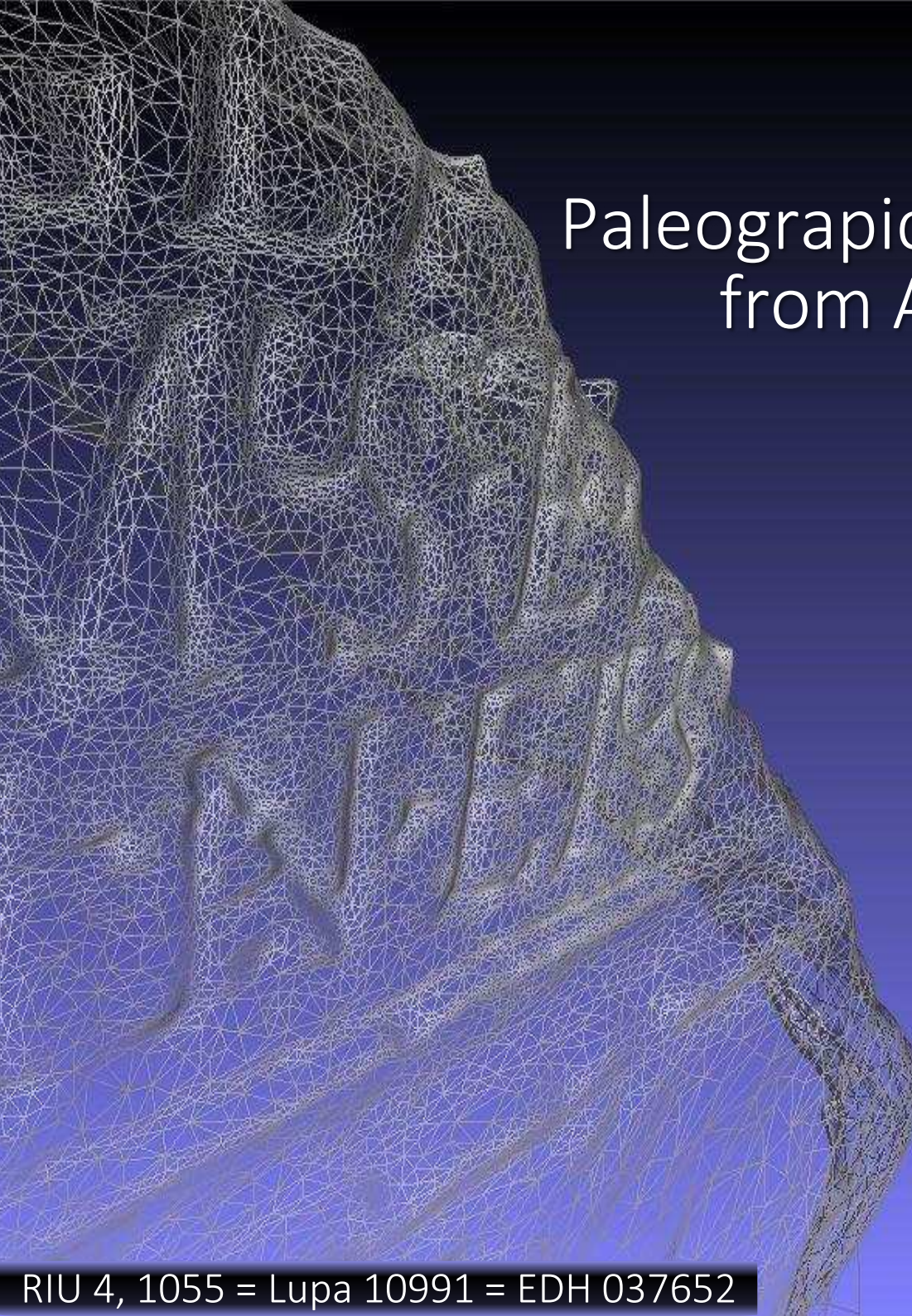


EAGLE

**Europeana
network of
Ancient
Greek and
Latin
Epigraphy**



A detailed 3D wireframe mesh of a stone relief sculpture, likely from Aquincum. The mesh is composed of numerous small triangles, creating a complex, textured surface that follows the contours of the original stone. The sculpture appears to be a profile of a head or a similar figure, with intricate details visible in the hair and facial features. The background is a solid blue gradient.

Paleogeographical analysis of monuments from Aquincum (Pannonia)

1. Review of methodology
2. 3D epigraphy, archaeological
photogrammetry

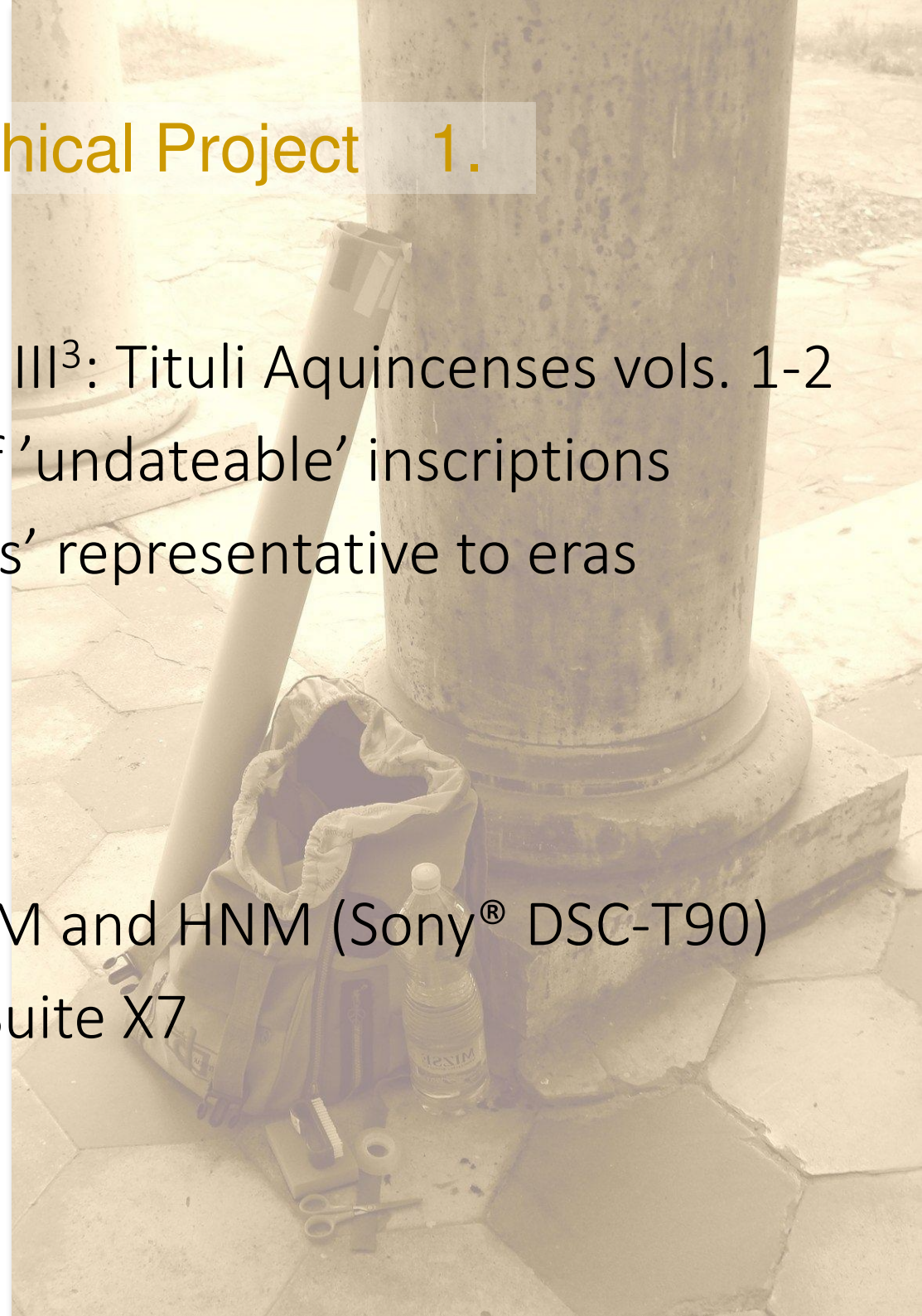
Agócs Nándor – Farkas István Gergő
University of Pécs (PTE)

Szabó Ádám
University of Pécs (PTE)
Hungarian National Museum (HNM)



The Aquincum Paleographical Project 1.

- ➔ sideproject along with CIL III³: Tituli Aquincenses vols. 1-2
 1. more precise dating of 'undateable' inscriptions
 2. determine 'letter styles' representative to eras
- ➔ applicances
 - ➔ hi-res photographs in AM and HNM (Sony[®] DSC-T90)
 - ➔ CorelDRAW[®] Graphics Suite X7



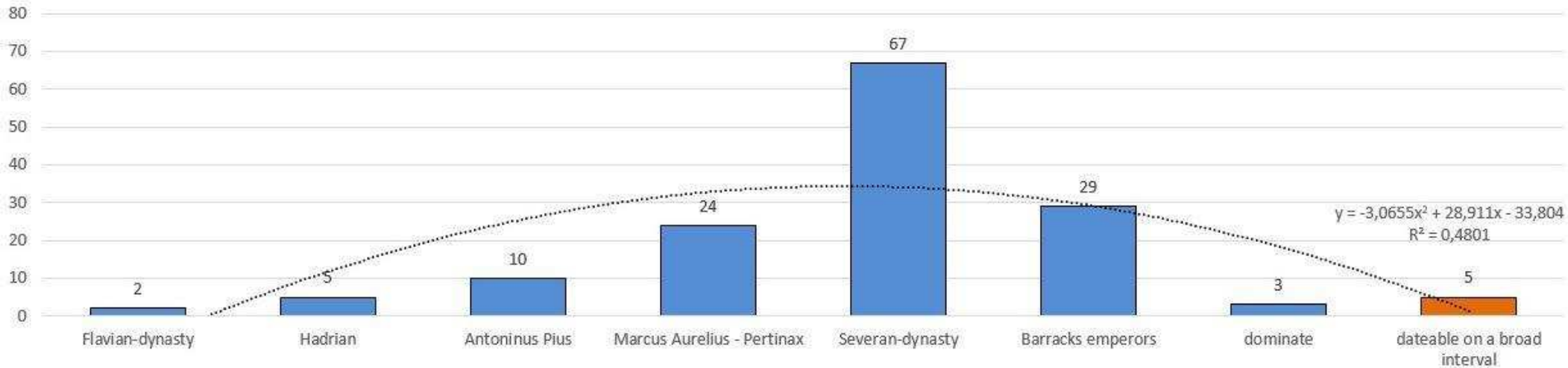
The Aquincum Paleographical Project 2.

- breakdown of the Aquincum material
 - **1022** inscriptions total (100.00 %)
 - **877** low-precision dating (85.81 %)
 - **145** high-precision dating (14.19 %)
 - **84**: consules (8.22 %)
 - **29**: Imperial titulature (2.84 %)
 - **25**: legati (2.45 %)
 - **7**: other magistrate (0.69 %)

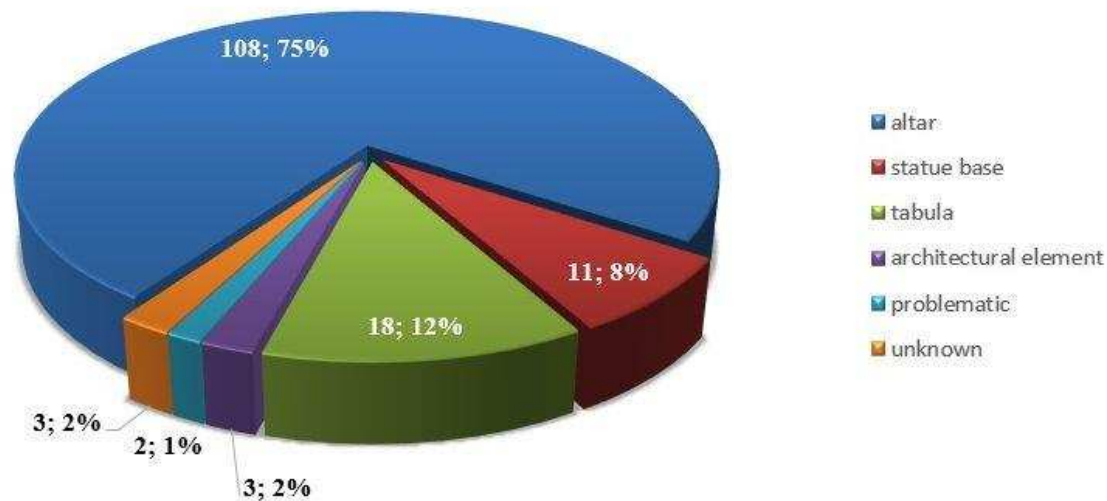


The Aquincum Paleographical Project 3.

Chronological distribution of dateable inscriptions



Distribution of inscriptions based on carrier



THE CLASSICAL APPROACH

MANUAL DRAWING AND DIGITALIZATION



Research history

- 1885 – 2011
- E. Hübner
- R. Cagnat

Aetatis Severianae monumentale ABCDEF GHI LMNOPQRSTV Aetatis Severianae elegans ABCDEF GHI LMNOPQRSTVX	
HÜBNER 1885, t. LXXXI.	referred source: -
Epoque de Septime Sévère. ABCDEF GHI LMNOPQRSTVX	
CAGNAT 1898, t. I.	referred source: HÜBNER, E
ABCDEF GHI L MNO PQRSTV A Ro. a. II. század vége és a III. század eleje. Monumentális. ABCDEF GHI L MNO PQRSTVX A Ro. a. II. század vége és a III. század eleje. Monumentális, metszékelt.	
BUDAY 1914, 33.	referred source: HÜBNER, E
ABCDEF GHI LMNOPQRSTVX Capital cuadrada elegante del tiempo de los Severos	
BATLLE HUGUET 1963, 115.	referred source: HÜBNER, E
ABCDEF GHI LMNOPQRSTVX	
MEYER 1973, 39.	referred source: -
ABCDEF GHI L MNO PQRSTV ABCDEF GHI L MNO PQRSTVX A 3. század második és a 4. század első felének kezdete.	
TÓTH – SZABÓ 1999, 155.	referred source: BUDAY, Á
ABCDEF GHI L MNO PQRSTV A Ro. a. II. század vége és a III. század eleje. Monumentális. ABCDEF GHI L MNO PQRSTVX A Ro. a. II. század vége és a III. század eleje. Monumentális, metszékelt.	
NÉMETH – KOVÁCS 2011, 55.	referred source: BUDAY, Á
ABCDEF G I L M N O P Q R S T V TitAq 267 ABCDEF G H I L M N O R S T V TitAq 70 H E M E N T E R	
Tracery of two inscriptions from the epoch of Emperor Caracalla, drawn within the framework of the present project	



ICAESA
CAESAR
CCALP

Tit. Aq. 1 = Lupa 10120

IO MEDISDE
ABVSO
THAER AV

Tit. Aq. 167 = Lupa 5141

ABCVLAPIO
IMARILVS
CASIRENSIS
MAD LECTIA
SVBOEFIC
OCCORNIV
IOCCOSDE

Tit. Aq. 31 = Lupa 10435

Flavian inscriptions

	A	B	C,K	D	E	F	G	H	I	L	M	N	O	P	Q	R	S	T	V	X	Z	NEXI
Tit. Aq. 1 [73]	A		C		E	F			I	L		N	O	P		R	S	T				
Tit. Aq. 2 [89/92]	A		C		E				I	M	N	O				R	S	T				



Tit. Aq. 1 = Lupa 10120



Tit. Aq. 2 = Lupa 10798

RR



Hadrianic inscriptions 1.

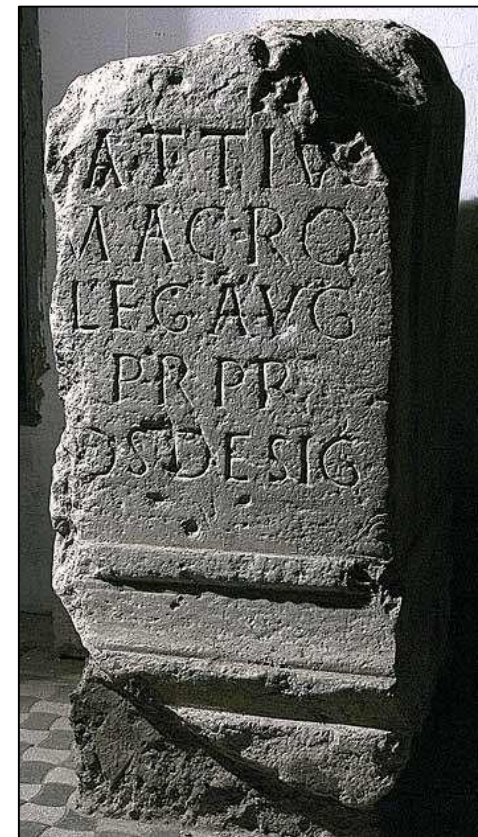
	A	B	C,K	D	E	F	G	H	I	L	M	N	O	P	Q	R	S	T	V	X	Z	NEXI
Tit. Aq. 149 [119/121]	A	B	C		E		G		I	L	M	N	O			R	S	T	V			
Tit. Aq. 407 [119/121]	A				E		G		I	L	M	N		P		R	S		V			
Tit. Aq. 944 [130/133]	A		C	D	E		G		I	L	M		O	P		R	S	T	V			



Tit. Aq. 149 = 5136



Tit. Aq. 407 = 10415



Tit. Aq. 944 = 5140



Hadrianic inscriptions 2.

I

L

R

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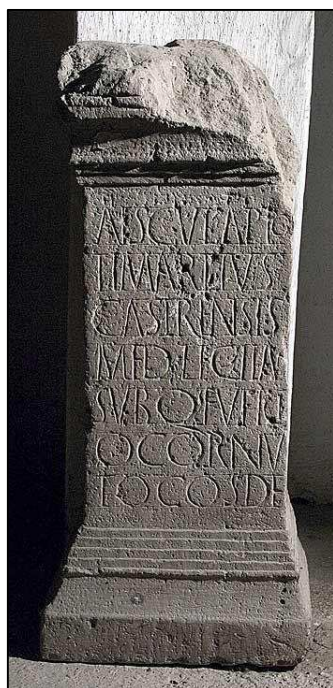
S

Antoninus Pius' era

	A	B	C,K	D	E	F	G	H	I	L	M	N	O	P	Q	R	S	T	V	X	Z	NEXI
Tit. Aq. 3 [145/161]	A		C	D	E	F	G	H	I	L	M	N	O	P		R	S	T	V			
Tit. Aq. 31 [146/147]	A	B	C	D	E	F			I	L	M	N	O	P			S	T	V			
Tit. Aq. 183 [153/157]	A	B			E		G		I	L	M		O	P		R	S	T	V			MR
Tit. Aq. 377 [156]	A	B	C	D	E		G	H	I	L	M	N	O	P	Q	R	S	T	V			E



Tit. Aq. 3



Tit. Aq. 31



Tit. Aq. 183



Tit. Aq. 377



A NEW APPROACH
PHOTOGRAMMETRY – REALISTIC 3D MODELLING



CLASSICAL METHODS

Tit. Aq. 88 = Lupa 9598



classical 2D photography

Tit. Aq. 88 = Lupa 9598



pressed copies

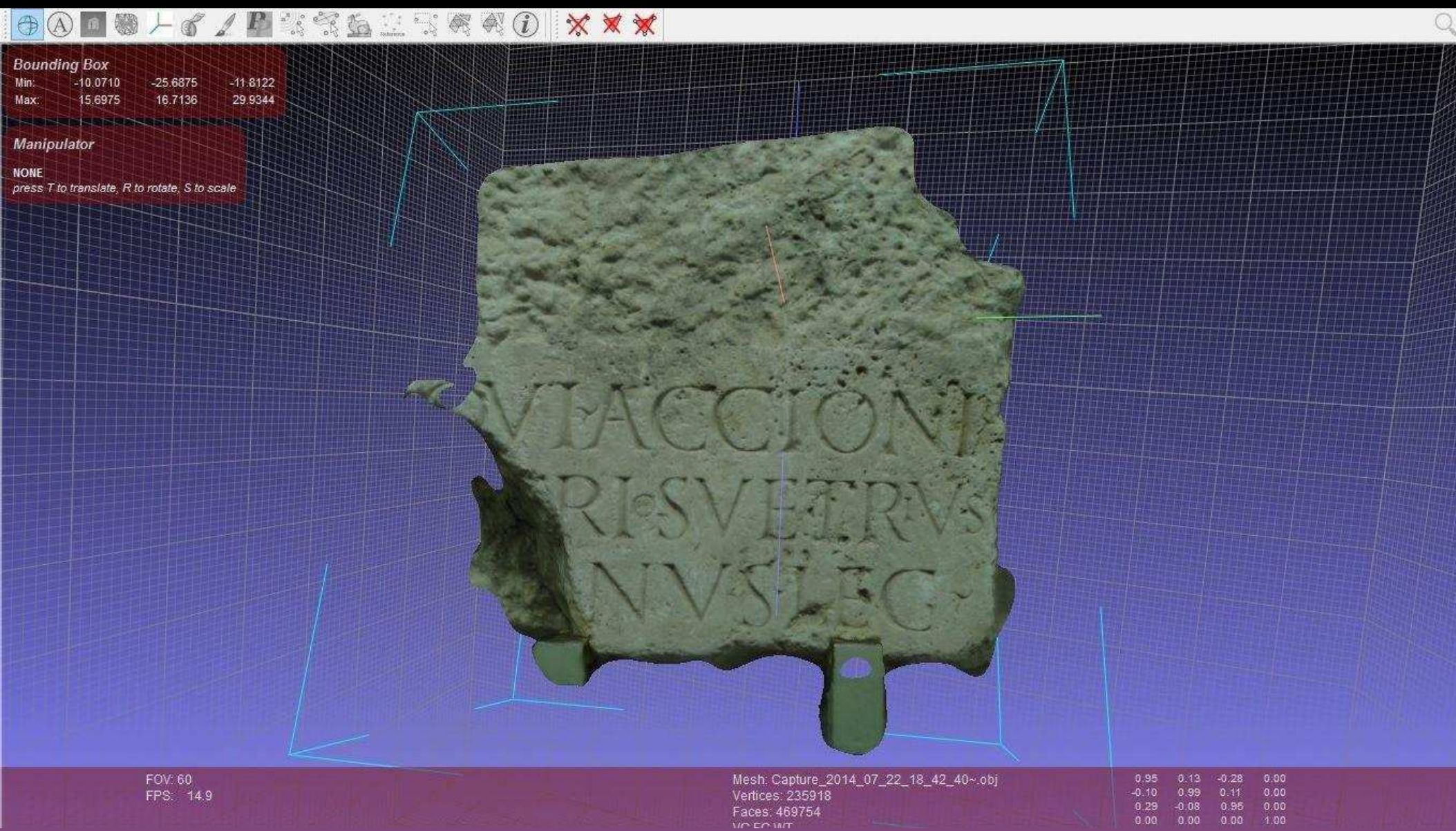
Tit. Aq. 386 = Lupa 5123



cellophane copies



Photogrammetry: Tit. Aq. 88 = Lupa 9698 in MeshLab



Tools of the trade

→ **Camera:** Canon[®] EOS 550D; EFS 16-85 mm

Specifications	
Stand:	Manfrotto stand; horizontal $\sim 10^\circ$; vertical 20 cm
Shooting:	Manual focus; 1/10 sec. shutter
Lighting:	Diffuse <u>or</u> grazing light conditions
Resolution:	ISO 6400 sens.; 5184x3456
Export format:	.cr2; .tif

→ **Photo merging:** Autodesk[®] 123D Catch *or* Microsoft[®] Photosynth 2.110.317.1042 *or* VisualSFM v0.5.24 *or* AgiSoft Photoscan

→ **Editing pc and mesh:** MeshLab v1.3.4BETA *or* CloudCompare v2.5.5.2



Photos to point cloud or polygon

10* – 100/200 photos

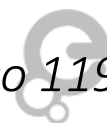
1. point cloud generation

AgisoftPhotoscan → ca. 500.000 vertices

2. polygon generation

Autodesk 123D → ca. 200.000 faces

* Correia Santos, M. J. - Pires, H., A estela funerária de Capela, Penafiel. *Fichero epigráfico* 119 (2014), 510. – 1 point / mm²



Outcome



RIU 4, 1451 = Lupa 10991



Summary

- photo realistic imaging offers detailed models (< 1 mm)
- more precise and time-efficient than other copying methods
- digitalization enables an easy and extensive reprocessing
- cost efficient methodology



Future plans, our goals!

- apply high resolution 3D scanning techniques to preserve the rapidly deteriorating epigraphical material stored in open-museum areas (laser scanning)
- create a searchable online database with realistic 3D models of Greek and Latin inscriptions (photogrammetry)
- possible paleographical research



Thank You for your kind attention!

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