Issue 608
E92-Spacetime Volume, E93-Presence, and related properties
Example from Notre-Dame collapsed arch
The case study: the collapsed arch F29-30 in the nave of Notre-Dame de Paris

Collapsed arch (GT Pierre – Bruno Phalip)

Anais Guillem, A collaborative work on the digital-physical anastylosis of the nave arch, SIGGRAPH 2022
Juxtapositions of 3D Data in Aïoli before/after F29-30 arch collapse

Point cloud
Tallon 2010
before fire

Point cloud surveys post fire: vaults and nef
(cleaning operations)

Anais Guillem, A collaborative work on the digital-physical anastylosis of the nave arch, SIGGRAPH 2022
Data to map

- archaeological data from lapidary study and inventory (voussoirs)
- coordinates of voussoirs after the fall, during the cleaning operations (Aioli tool): tracking of the voussoirs in space and time
- 3D documentation: voussoirs, ie. [http://vcg.isti.cnr.it/~callieri/notredame/](http://vcg.isti.cnr.it/~callieri/notredame/)
- arch before the fire (3D scan, Andrew Tallon 2010) - architectural survey
- parametric model for reconstruction (3D model)
- reasoning for the reconstruction: archaeological predicates, LP models
The physical anastylosis test

Voussoirs from the F29-30 arch

Physical anastylosis by LRMH and Stone working group (Leroux Lise, LRMH)

Anais Guillem, A collaborative work on the digital-physical anastylosis of the nave arch, SIGGRAPH 2022
Trajectory of a voussoir after its collapse

Voussoirs in the remains of the nave

Cleaning operations by unmanned machines

Anais Guillem, A collaborative work on the digital-physical anastylosis of the nave arch, SIGGRAPH 2022
Positions of voussoirs in the nave

Photo from photogrammetric dataset showing 2 voussoirs in the rubbles

Unmanned machine removing amounts of rubbles (including voussoirs)

Photogrammetric scene in Aioli taken during the cleaning operations

Anais Guillem, A collaborative work on the digital-physical anastylosis of the nave arch, SIGGRAPH 2022
Aïoli for tracking and identifying voussoirs

Use of Aïoli for the spatio-temporal tracking of the voussoirs (De Luca, 2021)

Anais Guillem, A collaborative work on the digital-physical anastylosis of the nave arch, SIGGRAPH 2022