



POLITECHNIKA  
LUBELSKA  
LUBLIN UNIVERSITY  
OF TECHNOLOGY



Laboratorium Programowania  
Systemów Inteligentnych  
i Komputerowych Technologii 3D

# 3D digitization of sacral wooden buildings from the Carpathian Mountains

Dr. Kamil Żyła

Dr. Jacek Kęsik

Dr. Marcin Barszcz

Prof. Dr. Marek Miłośz

Prof. D.Sc., Dr. Jerzy Montusiewicz

*Department of Computer Science*

*Lublin University of Technology*

*{k.zyla, j.kesik, m.barszcz, m.milosz,*

*j.montusiewicz}@pollub.pl*

## Abstract

Carpathian Mountains are a special place where many monuments of wooden sacral architecture can be found. Due to the location and the nature of materials used for construction, they are constantly exposed to destruction by slow processes (like atmospheric ones) and sudden events (like devastations caused by nature or human activity). This, combined with the unique values of these objects, leads to attempts to preserve them in digital form for the purposes of reconstruction and dissemination.

Works under the supervision of Prof. Jerzy Montusiewicz and Prof. Marek Miłośz have resulted among others in scientific expeditions to Cluj-Napoca (Romania) and to Sanok (Poland). Selected examples are presented below.

## Biserica de lemn din Păușa

The wooden church in Păușa of St. Hierarchy Nicholas (Sfântul Ierarh Nicolae) is located in the village of the same name in the Sălaj district, Romania and dates back to 1730. The object is on the new list of monuments under the LMI code: SJ-II-m-A-05092.

The church was built on a rectangular plan, with a recessed, pentagonal apse. The outer walls are decorated with a rope motif carved in the beams. The entrance door frames are very richly decorated with rosettes, a rope motif (so-called cords), and geometric motifs. The door frames leading from the women's gallery to the main nave are decorated with cord borders and geometric patterns and spiral rosettes. On the fragments of the walls, external paintings have been preserved, on which you can recognize scenes from the New Testament, such as the Assumption of the Virgin Mary or Mary surrounded by the Apostles. The church was restored in 1966–1968.



## Biserica de lemn din Creaca

The wooden church of Creaca is located in the village of the same name in the Sălaj district. Probably built in the 18th century, but there are no written records on the subject. It is on the new list of monuments under the LMI code: SJ-II-m-A-05044. According to tradition, the church was moved twice. The interior wall painting is attributed to the painter Ioan Pop from Românași.

The church has a window only on the south side, in which there is an almost completely obliterated external wall painting. The eaves (so-called Saturdays) were located on the north side and strongly connected to the top of the building. The church was restored in 1972 and then around 1998.



## Hardware and software

- 1) Artec Eva structured light 3D scanner
- 2) Faro Focus terrestrial laser 3D scanner
- 3) Artec Studio
- 4) Faro Scene
- 5) Reality Capture
- 6) Laptop Intel i9, 64 GB RAM, nVidia RTX 2080m



## Conclusions

The works led to the digitization of over seven wooden churches in Romania and Poland. 3D models of their interiors and exteriors were made. Obtained data and other results of undertaken efforts are among others published on website [carpatia3d.com](http://carpatia3d.com).

