



# MonuMAI

LA NOCHE EUROPEA DE L@S INVESTIGADOR@S



UGR

Universidad  
de Granada

DESQBRE  
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## WHAT IS MONUMAI

[MonuMAI](#) is a citizen science project idea by Fundación Descubre and the University of Granada (SOFT COMPUTER AND INTELLIGENT INFORMATION SYSTEMS Research Group) that offers the opportunity to get closer to the artistic heritage, combining art, mathematics, artificial intelligence and social communication of the science. It was launched as pilot experience in the framework of the European Researchers' Night in Andalusia.

MonuMAI is funded by Fundación Descubre and the University of Granada and has the support of the Regional Ministry of Education, Patronato of Alhambra, Canal Sur, the Association of Maths Teachers, the Andalusian Institute of Historical Heritage and Fundación Ibercivis.

Our aim, with the citizen-participants, is to train the algorithm and to teach it to identify these architectural styles from an image.

In addition, we will discover if there is a trend to prefer a proportion over others; we will investigate together about the mathematical secret of the beauty in our monuments.

The project has a multidisciplinary team of experts in Mathematics, Art, Artificial Intelligence, Citizen Science and Social Communication of Science for its promotion and coordination.

## WHY CITIZEN SCIENCE AT MONUMAI

Producing knowledge, based on the scientific method, to solve a problem or improve a situation that concerns the citizens, and doing it from, for and with society. That is how we understand Citizen Science at MonuMAI.

With this alliance, society poses new questions, provides experimental data that can develop new tools for researchers and contributes to the creation of a new scientific culture.

Citizens, while adding value to scientists, understand their work in depth. In addition, this experience contributes to improve their culture and therefore facilitates the use of scientific knowledge in their daily decision-making process, increasing their capacity for social participation.

Spain occupies a privileged place in the promotion of this new way of research. There are very relevant experiences to learn from, although most of them are led by associative movements and by the scientific community itself. The novelty of MonuMAI lies in being led by one of the most important research groups in Andalusia and an entity specializing in Social Communication of Science, integrating Mathematics, Art and Big Data.



The Citizen Science projects clearly improve the Science-Society-Politics relationship and promote a more democratic research, and in our case, it is also a weapon for the future as help also to the promotion of scientific vocations, and the incorporation of technology to the study and enhancement of artistic heritage.

## MAIN GOALS

### Scientific Objectives:

- To develop an algorithm that learns to recognize monuments using Deep Learning.
- To provide the scientific community with an open tagged database of heritage.
- To provide tools for the analytical or morphological study of the monument.
- To provide geometric and proportional models for the interpretation of the architectural object.
- To contribute to establish interdisciplinary links between science and heritage.

### Citizenship Objectives:

- To provide citizens with skills in participation in a collaborative scientific project of citizen science.
- To familiarize citizens with the scientific method.
- To discover the relationship between mathematics and art to citizens.
- To make artificial intelligence techniques accessible to daily life.
- To increase the use of mobile applications as a training element.
- Facilitate an integrated vision between aesthetic pleasure and pleasure for knowledge.

### Social Objectives:

- To contribute to the social awareness of the importance of architectural heritage.
- To prepare an open collaborative Andalusian architectural heritage map.
- To generate an open resource for teaching.



- To integrate knowledge into the aesthetic experience as a resource for scientific tourism.

## HOW MONUMAI WORKS

Sometimes, when we visit a city with great monumental wealth, or we walk through the streets of a charming town, we do not know how to recognize the architectural style that underlies it. Many times we do not even imagine that a cathedral or another building belonging to our past can simultaneously present several elements that classify it in more than one architectural style (Baroque, Renaissance, Mudejar, etc.).

The actual society, in which technology is increasingly integrated on the daily life, must and can highlight the cultural, architectural, mathematical and artistic value that underlies hundreds of churches, cathedrals or other historical buildings.

The project seeks to make the updating of databases, which until now have been a static process, a participatory process through Citizen Science. With this aim, we are developing an app that interacts with the user and discovers new data and sensations, looking for an active and collaborative component of the new typology of projects known as citizen science projects.

The app MonuMAI has as strength the Artificial Intelligence, and, once the project is finished, it will be able to recognize automatically architectural styles present in the images that are synchronized with the system. The techniques used (Deep Learning) will allow the system to be autonomous and improve with use.

MonuMAI, which is already available on both iOS and Android for free, aims to become an excellent educational, cultural and social tool for Andalusians and foreign visitors.



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