



# NANT 2016

**Book of Abstracts of  
Third International Conference  
MODERN METHODS OF TESTING AND EVALUATION  
IN SCIENCE**

NANT 2016  
Book of Abstracts of 3<sup>rd</sup> International Conference  
MODERN METHODS OF TESTING AND EVALUATION IN SCIENCE  
24-25<sup>th</sup> December 2016 in Belgrade

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## PREFACE

The volume of Book of Abstracts includes the selected abstracts presented at the 3<sup>rd</sup> International Conference "Modern Methods of Testing and Evaluation in Science" NANT 2016. The Conference takes place every year and this year was held on 24-25<sup>th</sup> December 2016. at Central Institute of Conservation in Belgrade.

The main aim of this Conference is to provide a Forum for researchers and experts from various country to exchange their ideas and achieved results, but also to include young people and students in scientific research and acquaint them closer with the methods of testing and evaluation in science. Having that in mind, we put additional emphasis on active participation of students and young researchers, so the idea is that all papers will be presented by students who previously contributed to these papers with their older colleagues.

The Conference brought together the participants from institutes and universities from various countries: Romania, USA, Bosnia and Herzegovina, Macedonia, Sweden, Spain, Montenegro, Slovenia and others.

The aim of the conference is, also, to connect different fields of science, because we can find many common points between different research areas, and by doing that, to open possibilities of developing new technologies or improving the old ones. Therefore, the Conference covers various topics from the following fields: mechanical science, transport and traffic engineering, material science, metallurgy, electrical engineering, civil engineering and other engineering areas, but all other sciences as well, including for example medical science, which uses various techniques of experimental examination and testing.

The program of the Third Conference consists of keynote lectures, oral and poster presentations.

Co-organizer of the Conference is Central Institute of Conservation in Belgrade and a main sponsor is BAS from Belgrade. We would like to kindly thank them for their help.

We would like to thank all authors who have contributed to this volume and also to the Scientific Committee, Organizing Committee, reviewers, speakers, chairpersons, and all the conference participants for their support for a successful scientific meeting.

Editors

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## AUGMENTED REALITY APPLICATION IN ENGINEERING STUDENTS SPATIAL ABILITIES ASSESSMENT

**Magdalena Dragovic<sup>1</sup>, Aleksandar Cucakovic<sup>1</sup>, Svetlana Cicevic<sup>2</sup>, Katarina Jevtic  
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Expanding technology, augmented reality (AR), where the customer/user can obtain various information about 3D digital model of an object in real time virtual presentation, has a wide range of applications. One of the fields of interest is cultural heritage preservation. Combined with 3D modelling, mostly based on 3D laser scanning data, AR enables a common user to visualize the object, i.e. cultural heritage monument in its' real surroundings. This is especially important in the cases when the monument is in ruined or devastated state. If reconstructed 3D model would give the clear visual impression about the monument and its historical value. This topic is especially interesting for engineering students, whose further professional activities would be involved in the tasks of cultural heritage protection.

Augmented reality applications, among other, are available through android phones, i-phones and tablets by 3D model upload and its real time presentation. AR applications aimed for architectural objects require certain manipulation skills regarding object's positioning on the mobile device's screen, as well as, geometry knowledge for obtaining correctness. In this research, a testing was performed regarding spatial abilities of the engineering students, which had a task to incorporate the 3D model of the cultural heritage monument into several variants of 2D and 3D scene, as well as decomposition and recognition of elements of the structure. 3D digital Auto CAD model (geometric model) of reconstructed one nave church in Serbia, in monastery complex Kastaljan, on the mountain Kosmaj, was used for the testing purposes.

*Keywords: augmented reality application, spatial abilities, cultural heritage monument, 3D model.*



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