DEEP TECH 2M

BOOK OF ABSTRACTS

DEEP TECH OPEN SCIENCE DAY 2024

1ST DEEP TECH OPEN SCIENCE DAY CONFERENCE

APRIL 5, 2024, KRAGUJEVAC, SERBIA

European Institute of Innovation & Technology

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Nenad Grujović, Boban Stojanović

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Preface

FIRST DEEP TECH OPEN SCIENCE DAY CONFERENCE 2024 has been designed as the Science Fair - forum and exhibition of research results in all areas of science and innovation. Deep Tech brings together different fields of science that provoke major changes in the world today, such as:

Advanced Materials and Manufacturing
Aerospace
Artificial Intelligence and Machine Learning
Biotechnology
Blockchain
Web 3.0
Electronics
Photonics
Quantum Computing
Robotics
Semiconductors (Microchips)
Sustainable Green Energy and Clean Technologies

The conference presented an opportunity to gather young researchers and renowned scientists. The conference aimed to bring together young and senior researchers for networking, brainstorming, and promotion of science to scholars, students, prospective PhDs and young people and offers students the opportunity to experience the practices of science and engineering.

Deep Tech Open Science Day Conference 2024, in the form of the exhibition fair, was held on April 5, at Faculty of Engineering, University of Kragujevac. The Conference was opened by the vice-rector of University of Kragujevac, Vladimir Rankovic, dean of the Faculty of Engineering, Prof. Dr. Slobodan Savić, dean of the Faculty of Science, Prof. Dr. Marija Stanić, the State Secretary, Ministry of Science, Technological Development and Innovation, Prof. Dr. Miroslav Trajanović, CEO of MIND – Milanović Industries Group, Darko Djorić, the coordinator of the Innovation Incubator of University of Kragujevac, Nemanja Jovičić and Conference General Chair, Prof. Dr. Fatima Živić, Faculty of Engineering, University of Kragujevac.

Conference Organizing Committee, Prof. Dr. Fatima Živić and Prof. Dr. Nenad Grujović, from Faculty of Engineering, Prof. Dr. Boban Stojanović and Prof. Dr. Ana Kaplarević-Mališić, from Faculty of Science, University of Kragujevac, delivered the talks related to the Conference background:

- What is Deep Tech?
- Additive Technologies and Innovations
- Spinoff companies – the path from the research to market
- Why do we need market validation of research thesis?

Panel discussion "STARTUPS: yes or no?" was held with panelists: Dr. Vesna Rašković Depalov, EEN Serbia – BINS, Novi Sad, Dr. Nevena Mihailović, founder of HerbaLab cosmetics, research associate at the Institute of Chemistry, Faculty of Science, University of Kragujevac and Nemanja Jovičić, coordinator of the Innovation Incubator of the University of Kragujevac who discussed the Research commercialization, Intellectual property

rights in multidisciplinary teams, Experiences of startup founders – what is the most challenging?, and How can the Innovation Incubator of the University of Kragujevac help in founding the startup.

More than 90 research groups presented their works as physical exhibits, posters and virtual presentations, including two high school student teams and several student teams, as well as more than ten companies that have joint research with University of Kragujevac. Different state-of-the-art scientific areas were presented. Conference had more than 500 visitors, including researchers, university students and PhDs, and high school students from three secondary schools, who have discussed scientific topics with researchers and made contacts for further collaborations.

Deep Tech Open Science Day Conference 2024 was jointly organized by the Faculty of Engineering and Faculty of Science, University of Kragujevac, as the first scientific Conference of such concept in Serbia, with scientific articles presented through exhibits, sample model, real systems and machine elements, virtual show and simulations, providing hands-on experience on science for young and prospective researchers. The objective of the Conference and training event was to promote and educate on Deep Tech and science to the HEI academics and non-academics, researchers, and young people, as well as to the companies and general public and to enable networking between the HEI innovation ecosystem stakeholders. Most participants were from the Faculty of Engineering and Faculty of Science, but there were also participants from the Faculty of Philology and Art, Faculty of Economics, Faculty of Medical Sciences, and Institute for Information Technologies from University of Kragujevac, as well as from companies that have joint research with University of Kragujevac, Serbia.

The Conference was very successful with participation of the large number of young people – young researchers and prospective researchers and PhD students. The Conference model of scientific research fair showed that such a new concept of scientific work presentation is very well accepted by the young people who actively participated during the whole time of the Conference. Special contribution to the Conference was participation of the "Lego musketeers" team of the high school students who won the 1st Prize at national championship, the 1st Prize in finals of the Lego league in Slovenia and won Engineering Excellence award 1st place at FLL Florida Sunshine Invitational world event on June 19 – 22, 2024 – First Lego League Florida Sunshine Invitational, USA.

Images from the Deep Tech Open Science Day Conference 2024 are given at
http://deeptech2m.eu/index.php/2023/12/25/prvi-deeptech-otvoreni-dan-nauke/

Kragujevac, 2024

Conference Chair
Prof. dr Fatima Živić

TABLE OF CONTENTS

Application of Altair software in structural analysis of complex geometry

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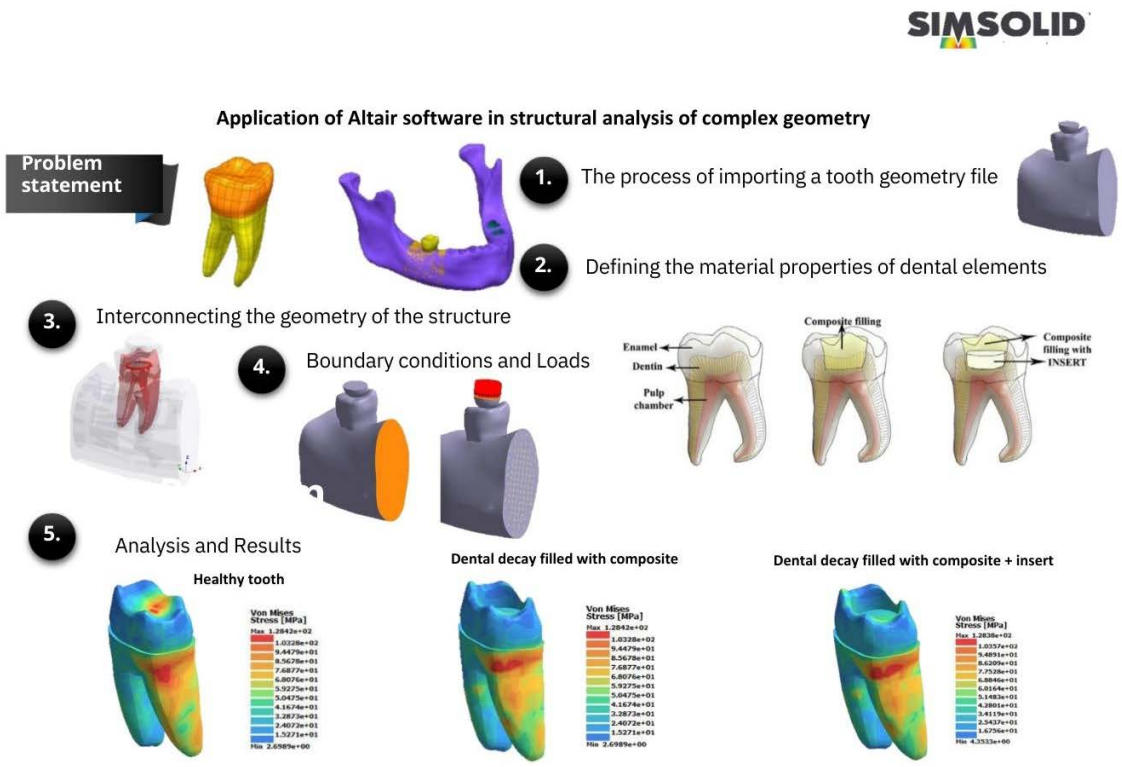
Graphical abstract



Abstract

In this paper, the application of Altair software SimSolid for the numerical analysis of the construction of complex geometry is investigated. Traditional simulation methods based on the finite element method require large computing resources, geometry preparation time, appropriate mesh modeling, and time necessary for computational problem-solving. SimSolid, a product of Altair, provides a significant acceleration of this process, making it efficient and affordable.

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In addition, the basic principles of work in the SimSolid software are explained in this paper. A special focus is placed on the process of importing geometric constructions, selecting materials, selecting the type of analysis, how to connect corresponding parts of construction, setting boundary conditions, setting loads, running analysis, and postprocessing the analysis results.

The practical application of research and innovations I present at the conference involves harnessing the scientific or technological potential of Altair's SimSolid software in analyzing the structural integrity of complex tooth geometries, with a focus on its application in dentistry. This conceptual example demonstrates the software's ability to streamline structural analysis processes in dental applications, enabling efficient assessment of the strength and durability of intricate dental structures. By utilizing SimSolid, dentists can enhance their approach to planning and designing dental solutions, improving the quality and longevity of prosthetic work, and ensuring optimal functionality and aesthetics for patients.