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University  
of Rijeka  
**Faculty of  
Civil Engineering**

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# P R E D A V A N J A

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## **1. Modelling of Helmet Impacts**

[07.04.2025. 16:00-17:00](#) | [08.04.2025. 10:00-12:00 & 14:00-15:00](#)

## **2. Modelling of Human Brain**

[08.04.2025. 15:00-16:00](#) | [09.04.2025. 14:00-16:00](#)

## **3. An Introduction to Computational Peridynamics - Towards the Computer Integrated Surgery of the Human Brain**

[11.04.2025. 09:00-12:00](#)

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**Professor Ugo Galvanetto**

Department of Industrial Engineering, University of Padua, Italy



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Građevinski fakultet, Sveučilište u Rijeci  
Radmile Matejčić 3, Rijeka, Predavaonica G003

## SAŽETAK

The lectures will cover the research activities carried out by Ugo Galvanetto and his collaborators over the last 15-20 years.

While at the Department of Aeronautics at Imperial College London, Ugo started his research on Personal Protective Equipment (PPE), funded by the EU and private companies. The main objective was to define a method for virtual testing of safety helmets. Such a procedure has now become common practice in the production cycle of the main Italian manufacturer (Dainese-AGV). This part of the course lasts four hours.

Long interactions with European researchers and industrial practitioners convinced Ugo that the improvement of safety helmets required the incorporation of models of the human head. So when he returned to Padova, he started a new line of research with his colleague Piero Pavan on the generation of individual head models to be coupled with helmets for a more reliable design process. This research is still ongoing. This part of the course lasts three hours.

Finally, Ugo has recently decided to try to combine his interest in peridynamics with brain biomechanics for Computer Integrated Surgery of the human brain. Three hours of lecture will cover the main principles of peridynamics, with only a brief description of the research planned for the future.

The first seven hours, on helmets and the head, will mainly be an explanation of how Ugo's group has used FEM to solve problems. The last three hours will be at a higher scientific level, with the aim of providing an accurate description of the main ideas on which peridynamics is based.

## Kratki životopis predavača

Ugo Galvanetto is a Professor of Aerospace structures in the Department of Industrial Engineering of the University of Padova, Italy. Ugo's research interests are in various fields of computational mechanics: virtual testing and design of personal protective equipment, biomechanics, fracture mechanics and coupling techniques of local and non-local computational methods. He has been author or co-author of 130+ peer-reviewed journal publications. He spent more than ten years in the Dept. of Aeronautics at Imperial College London and was the principal investigator of several research projects funded by the European Union or by other institutions. He served as a member of the editorial board of the international journals SHM and MAMS. He is an Associate Editor of the CEAS-Aeronautical Journal and of the Journal of Peridynamics and Nonlocal Modeling. Ugo is the Head of Undergraduate and Postgraduate Studies in Aerospace Engineering of the University of Padova.