SSIP 2021 lecture information

Information about the lecture	
Title	**Analysis of sports scenes using deep neural networks**
Keywords *(up to 5 keywords, separated by commas)*	Object Detection, Object Tracking, Action Recognition, Deep Neural Networks, Handball
Summary *(up to 1,500 characters)*	This lecture deals with the application of deep neural networks in the analysis of sports scenes such as player detection, tracking and recognition of player activities. Scenes taken during handball games and training will be used as an example. Handball is a team sport of two teams with 7 players each. It is played in the hall, with the ball according to well-defined rules. Players change roles during the game, from defense to offensive, using various techniques and actions to score or defend a goal. The aim of the analysis of sports handball scenes is multiple, from helping the player and coach in monitoring the performance and progress of players, analysis of techniques, assistance in refereeing and the like. This is a very challenging task for object detectors and trackers, given that players move quickly on the field under artificial lighting with cluttered background, change their position and distance to the camera, often overlap, ... The lecture will provide basic information about neural networks and convolutional deep neural networks and present several sports scene analysis experiments using state-of-the-art deep neural networks, that include player and ball detection, player tracking, and activity recognition. Also, the ability to use additional low-level features in the models will also be demonstrated. In conclusion, open issues and challenges in applying deep learning methods, in such a dynamic sports environment, will be discussed.
Note: The expected time frame for your lecture is 50 minutes plus 10 minutes for the Q&A. If you need more time for your presentation, please let us know – we'll do our best to make the arrangements accordingly. Ideally, the lecture will be suited for PhD students and young researchers of varying backgrounds.	

Lecturer information	
Name	Marina Ivasic-Kos
Affiliation	Department of Informatics, University of Rijeka
Keywords concerning your primary research interests *(up to 5 keywords, separated by commas)*	Computer Vision, Machine and Deep Learning, Object Detection, Object Tracking, Action Recognition
Short CV (narrative) detailing your primary research interests *(up to 1,500 characters)*	Marina Ivasic-Kos is an Associate Professor, Head of the Department of informatics and Head of the Laboratory for Computer Vision, Virtual and Augmented Reality at the Centre for Artificial Intelligence,

	University of Rijeka. She earned her Ph.D. in Computer Science at the Faculty of Electrical Engineering and Computing in Zagreb in 2012. She has been involved in several business and research projects in information and computer science fields as well as several ICT COST, Erasmus+ and EU HKO projects. She is the project leader of research project Automatic recognition of actions and activities in multimedia content from sports domain and principal researcher at project Knowledge-based approach to crowd analysis in video surveillance both funded by National Research Agency. She also runs two projects funded by the University of Rijeka that deal with the automatic recognition of actions in sports and a national project for career development of young PhDs. Her research interests are focused on artificial intelligence, computer vision and knowledge representation. She presented her research at numerous conferences and journals. She is a topic board member of MDPI Journal of Imaging and reviewer for high-cited journals such as Pattern Recognition, Expert Systems with Applications, IEEE Transactions on Fuzzy Systems, IEEE Transactions on Cybernetics, IEEE Signal Processing, IEEE Access, International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems, MDPI Sensors, MDPI Entropy.