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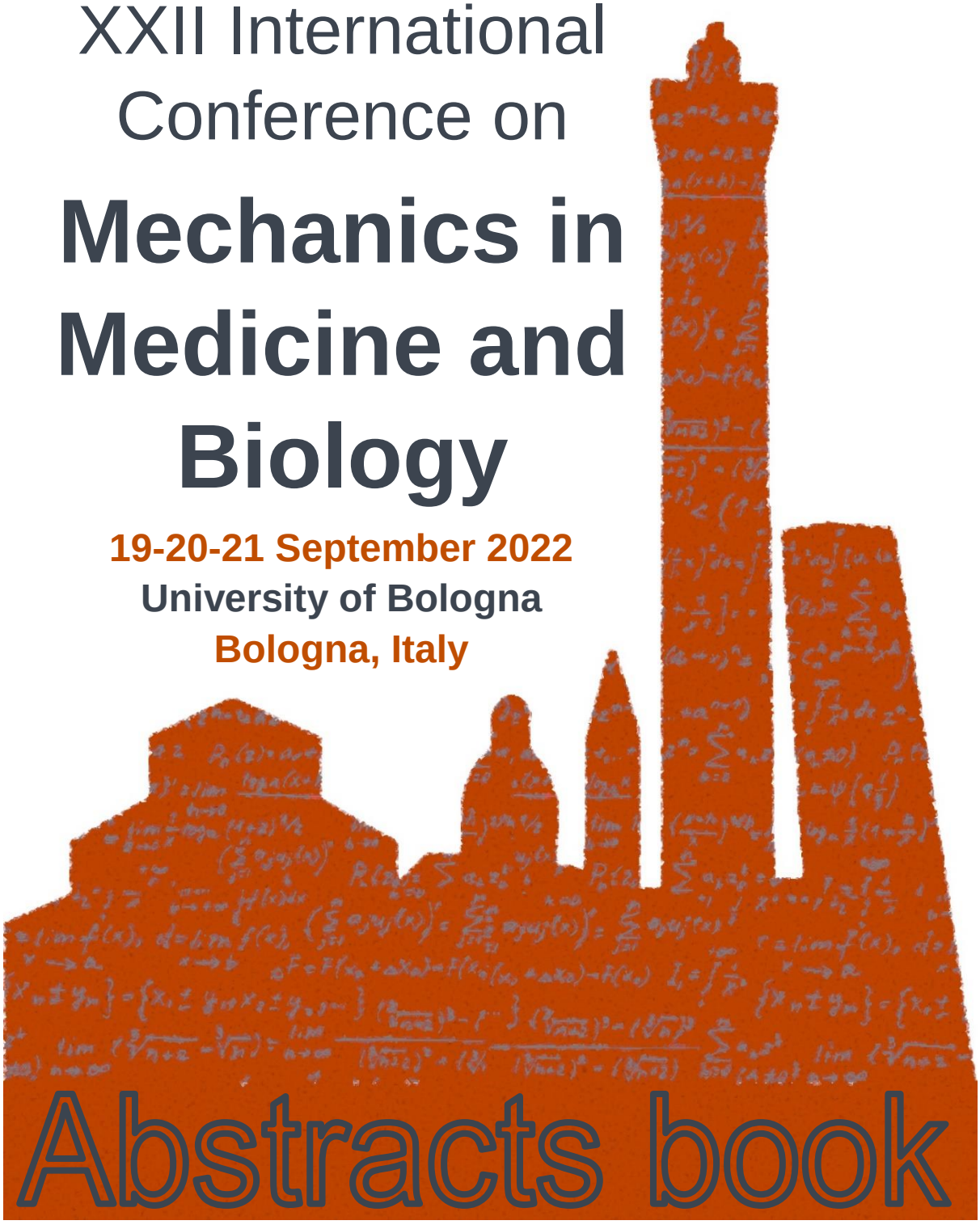

Abstracts book

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ABSTRACTS BOOK

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Elena Nardi, Ivan Corazza, Laura Cercenelli, Pier Luca Rossi

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radiological examination. These images are obtained from QaTa-COV19 dataset. In the proposed study, segmentation is attempted with hybrid U-Net architecture with two Transfer Learning (TL) techniques such as VGG16 and VGG19 to quantify the lung anomalies for clinical evaluation. Hybrid architecture such as U-Net VGG16 and U-Net VGG19 are executed by replacing the conventional U-Net encoder path. These TL techniques improve the learning instances of U-Net using smaller kernel size and reduced number of convolution layers. The segmentation is validated with various performance measures. The result shows that hybrid architecture such as U-Net VGG16 and U-Net VGG19 outperform conventional U-Net methods. Also, U-Net VGG19 shows a higher Dice coefficient and accuracy of 94.36% than U-Net VGG 16 for considered images. Hence, this approach will allow the radiologist to provide better decision making.
Keywords: *Hybrid architecture, Transfer Learning, COVID-19*

Explainable Machine Learning Framework for Age Prediction using Brain Complexity Features.

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SHAP (SHapley Additive exPlanations) is a framework for Explainable Artificial Intelligence (AI) that makes explanations locally and globally. In this work, we propose a general method to obtain representative SHAP values within a repeated nested cross-validation procedure and separately for the training and test sets of the different cross-validation rounds to assess the real generalization abilities of the explanations. We applied this method to predict individual age using brain complexity features extracted from Magnetic Resonance Imaging (MRI) scans. In particular, we used various implementations of the fractal dimension (FD) of the cerebral cortex - a measurement of brain complexity. Representative SHAP values highlighted that the recent implementation of the FD had the highest impact over the others and was among the top-ranking features for predicting age. SHAP rankings were not the same in the training and test sets, but the top-ranking features were consistent. In conclusion, we propose a method that allows a rigorous assessment of the SHAP explanations of a trained model in a repeated nested cross-validation setting.
Keywords: Brain complexity, explainable AI, fractal dimension, machine learning, SHAP.

S5L: SPORT SCIENCE

Effects of a 3-month outdoor training program on physical performance and quality of life

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A growing number of studies suggests that the practice of outdoor training in blue and green spaces induce beneficial effects on quality of life. However, several exercise programs were proposed, and different health parameters were evaluated in younger and elder people. The aim of the preset study is to evaluate the effects of outdoor high-intensity interval training (HIIT) on younger adults' health outcomes, using innovative technology assessment such as wearable devices. Younger adults with no contraindication to practice high intensity training were recruited and divided into two groups: the experimental group (two training session per week for three months) and the control group (no intervention). Direct parameters and indirect cardio-respiratory parameters efficiency as ECG, respiratory rate, body temperature, HR and HRV, and stress factors will be evaluated using an innovative wearable device produced by ACCYOURATE®. Also, many parameters physical performance (VO_{2peak}, Strength and Speed) and QoL related will be detected at baseline (T_0) and follow-up (T_1). We expected the intervention to be feasible and effective in improving direct and indirect health parameters, quality of life and physical performance in younger healthy adults.
Keywords: *physical exercise; outdoor; wearable device.*