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Up-scaling for measuring the spatial distribution of radiation dose for applications in the preparation of individual patient treatment plans

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The super-resolution (SR) techniques are often used in the up-scaling process to add-in details that are not present in the original low-resolution image. In radiation therapy the SR can be applied to enhance the quality of medical images used in treatment planning. The Dose3D detector measuring spatial dose distribution [1], the dedicated set of ML algorithms for SR has been proposed to perform final dose distribution up-scaling. As the SR technique, the SRCNN [2] architecture has been adjusted. The training and validation data being produced with MC simulation with two different scoring resolutions. Extra features related to the beam shape have been defined. The input data resolution is the one coming from the measurement (1cc) and the target data resolution is defined at the level of the CT image. Our research's latest breakthroughs and advancements will feature at the conference.
References:
[1] https://dose3d.fis.agh.edu.pl,
[2] https://doi.org/10.1007/978-3-319-10593-2_13

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