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Radiomics

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Radiologic images uniquely represent the spatial fingerprints of a progressing disease over time. "Radiomics" coins the emerging endeavor to systematically extract, mine and leverage this rich information in a personalized medicine approach. We establish and study comprehensive imaging phenotypes reflecting multiple time-points and modalities that can be directly linked to other information sources such as clinical, biological, genomic or proteomic parameters. This challenge requires novel developments at the core of computer science as well as close collaboration with research units from radiology, medical physics and oncology to enable successful translation to the clinic. Research topics include automated image understanding for anatomical structure detection and lesion segmentation as well as derivation of quantitative imaging biomarkers. Our special interest is in investigating the use of data-driven paradigms such as deep and weak learning strategies for building robust models and tapping the full potential of the information encoded in the images.

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