FAKULTÄT für PHYSIK
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MÜNCHEN/GARCHING

PHYSIK-DEPARTMENT
TECHNISCHE UNIVERSITÄT MÜNCHEN
MÜNCHEN/GARCHING

MLL-KOLLOQUIUM

Donnerstag, 22.11.2018, 16^{15} Uhr

Hörsaal der LMU in Garching, Am Coulombwall 1
Treffen zum gemeinsamen Kaffee 16 Uhr

Prof. Marc Kachelrieß

(Deutsches Krebsforschungszentrum DKFZ, Heidelberg)

Advances in Computed Tomography (CT)

Diagnostic computed tomography (CT) and cone-beam computed tomography (CBCT) are medical imaging modalities based on the same physical principles and on the same acquisition principles: an x-ray source and a detector rotate around the patient, a multitude of projection images from different angles is acquired and an analytical or iterative image reconstruction algorithm converts them into a CT volume representing the three-dimensional distribution of the linear attenuation coefficient. Typical use cases are diagnostic CT, image-guided radiation therapy, interventional C-arm CT, and digital volume tomography (dental CBCT), for example, with the number of applications and modalities increasing. In the future CT and CBCT will see new hard- and software technologies. In particular the transition to photon-counting detectors may be a decisive step towards lower x-ray dose, better image quality, and spectral imaging in both CT and CBCT. Motion compensation algorithms will allow for sharp images even for moving objects and thus for new CT and CBCT applications. Moreover, machine learning algorithms will improve data processing and image reconstruction and promise CT and CBCT imaging with less artifacts and at lower dose. This lecture gives a short overview of CT and CBCT and highlights their future advances.

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