

PROPOSITIONS

belonging to the thesis

Improving the Imaging of Small High-Density Structures in Computed Tomography

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- 1- Partial volume effects in Multi-row Spiral Computed Tomography (MSCT) images, often referred to as *blooming* or *blurring* artifacts are a direct consequence of the limited spatial resolution of MSCT systems. The effect does not only affect small high-density objects, but also other small objects of the image independently of their density and composition.
- 2- Phantom experiments and numerical simulations are effective tools to characterize CT scanners. They provide an efficient means to analyze system limitations when imaging small structures such as atherosclerotic plaques and narrow vessels.
- 3- Micro-focus CT provides a more accurate and reliable reference than the standard histological analyses for the volumetric characterization/quantification of the in-vitro atherosclerotic plaque with MSCT.
- 4- Image quantification based on absolute HU thresholds is an inappropriate method to measure objects with sizes similar to or smaller than the system's Point-Spread-Function.
- 5- Fixed HU threshold quantification methods result in inter-scanner and inter-protocol measurement variability.
- 6- Different generation scanners provide similar measurement accuracy when applying appropriate quantification methods such as the 50% relative threshold.
- 7- By combining information from both the original image and a deconvolved version of the image *Histogram-based Selective Deblurring* (HiSD) results in improved visualization and quantification of small high density structures while minimizing ringing artifacts in the surrounding soft tissue.
- 8- Statistics should not be used to fill the gaps of non-rigorously designed experiments.

- 9- Palliating Global Warming demands active government compromise and additional contemporary social laws rather than just an appeal to the individual conscience for action.
- 10- Woman micro credit projects are revolutionary not only from the economical but also from the social and political points of view.
- 11- Nowadays, even educated minds are rather governed by communication media than by their own reasoning. This is what makes our reactions easier to predict and our political course harder to be changed.

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