Magnetic Resonance Materials in Physics, Biology and Medicine

Automated reference tissue normalization of T2-weighted MR images of the prostate using object recognition

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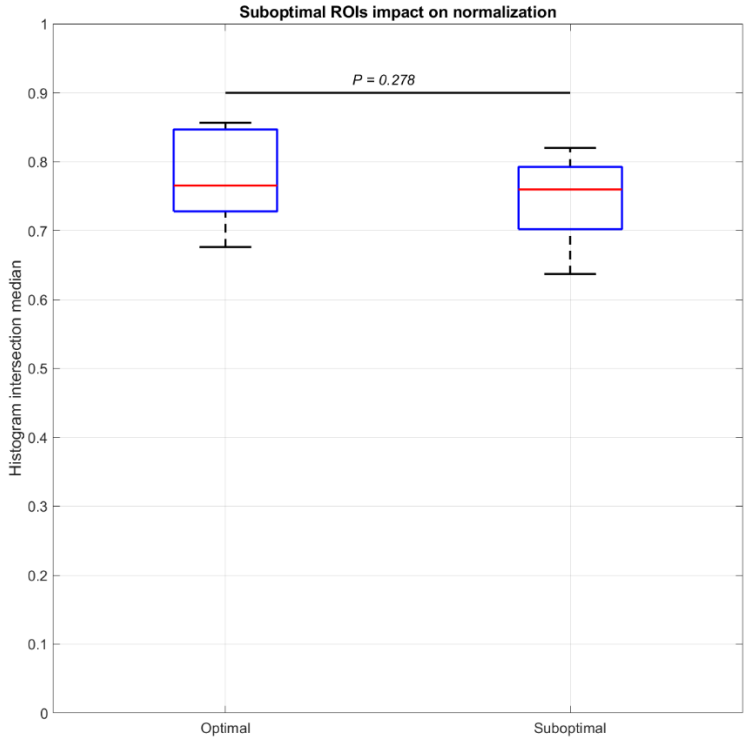
Online Resource 2

All suboptimal automatically extracted ROIs using AutoRef and their impact on the normalization

The suboptimal ROIs impact on the normalization:

To measure the suboptimal ROIs impact on the normalization, we compared the medians of the histogram intersections of all the cases with suboptimal ROIs with an equivalent number (overall and per dataset) of randomly selected cases with optimal ROIs. For each case, the median of the histogram intersections with the rest of its dataset cases, excluding those with suboptimal ROIs, was taken. Wilcoxon signed rank test was used to assess the statistical difference and *p*-values less than 0.05 were considered statistically significant. The test showed no significant difference between the medians (p=0.278).



The suboptimal automatically extracted ROIs using AutoRef:

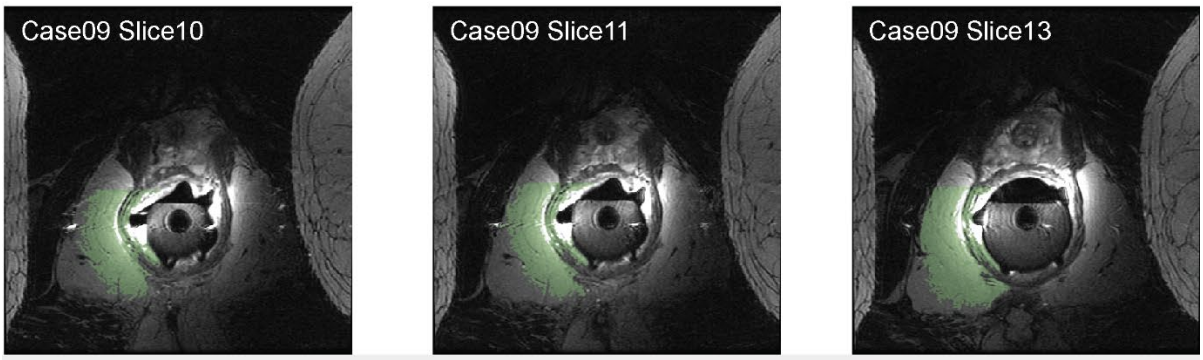
Below, each row represents a case, while the columns are the 3 detected regions-of-interest (ROIs) for that case. The fat ROIs are in green and the muscle ROIs are in red. Under each case of PROMISE12 test subset, the absolute relative difference of the reference intensity values between the manual and automated approach has been given.

Criteria:

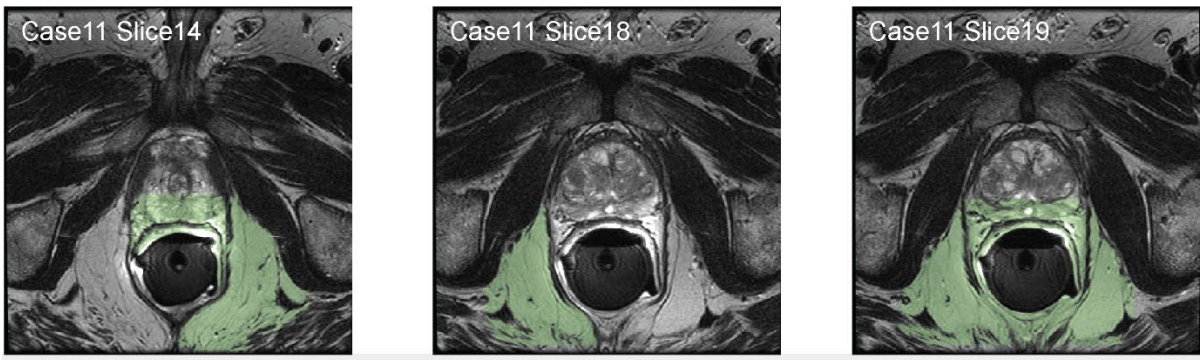
A case was considered a suboptimal when any of its extracted ROIs failed to detect the fat or muscle tissue, or covered additional regions not belonging to fat or muscle.

PROMISE12 test subset

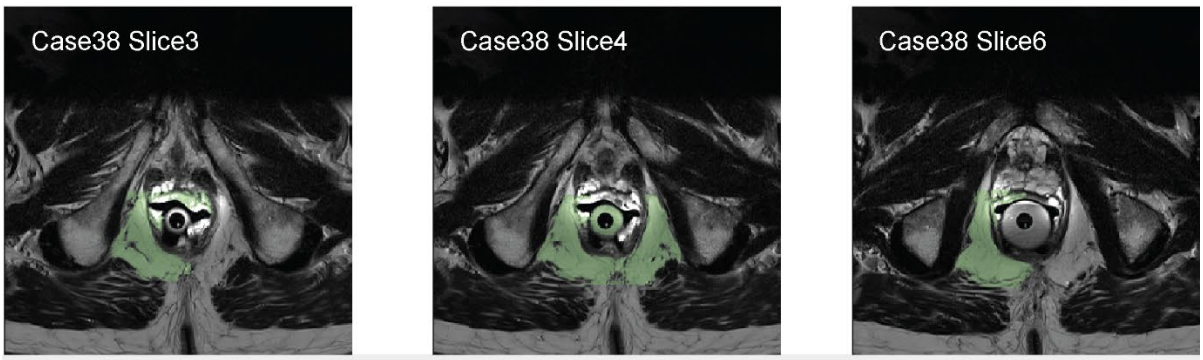
The absolute relative difference = 16.37%



The absolute relative difference = 29.46%

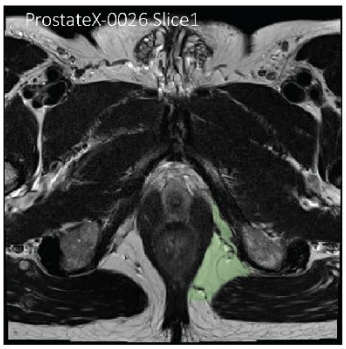


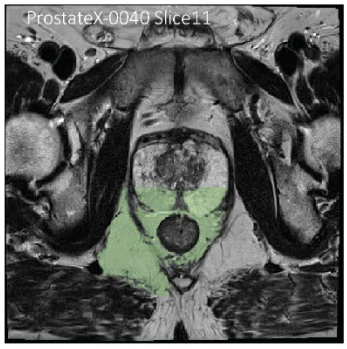
The absolute relative difference = 6.96%

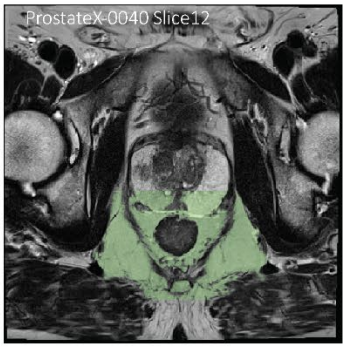


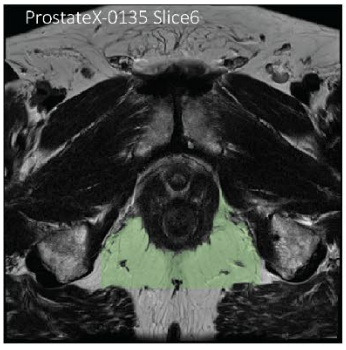
The absolute relative difference = 39.86%

PROSTATEx dataset



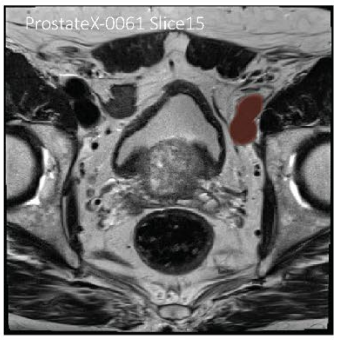







ProstateX-0061 Slice10


ProstateX-0061 Slice13

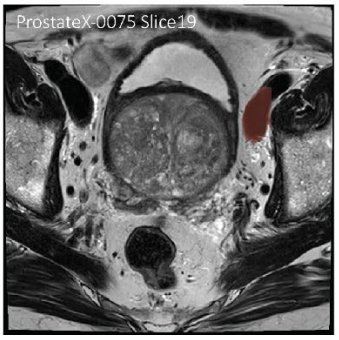

ProstateX-0061 Slice15

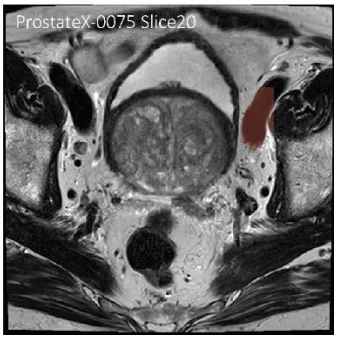

ProstateX-0062 Slice4


ProstateX-0062 Slice11


ProstateX-0062 Slice13


ProstateX-0075 Slice6


ProstateX-0075 Slice19


ProstateX-0075 Slice20