AUTOMATIC BONE AGE ESTIMATION FROM LEFT HAND MR IMAGES

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Motivation

Legal majority age is important question in forensic application, e.g. asylum seekers without documents.

Established methods use hand X-ray (projection, radiation exposure)

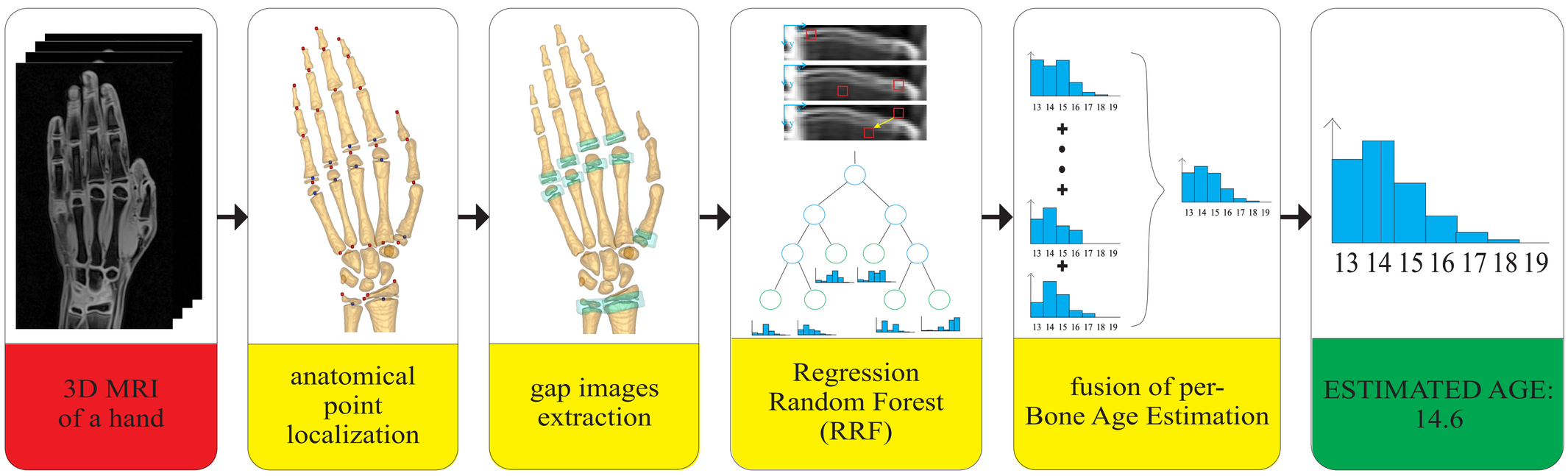
Radiologist perform subjective atlas based bone age estimation (BEA)

Discussion & Conclusion

RF framework localize the epiphyseal gap regions in 3D MR hand images and finds discriminative features in the gap regions relevant for BAE.

Results are in line with the established methods based on X-ray projections, thus involving radiation exposure.

Larger database that will involve children is our future step.



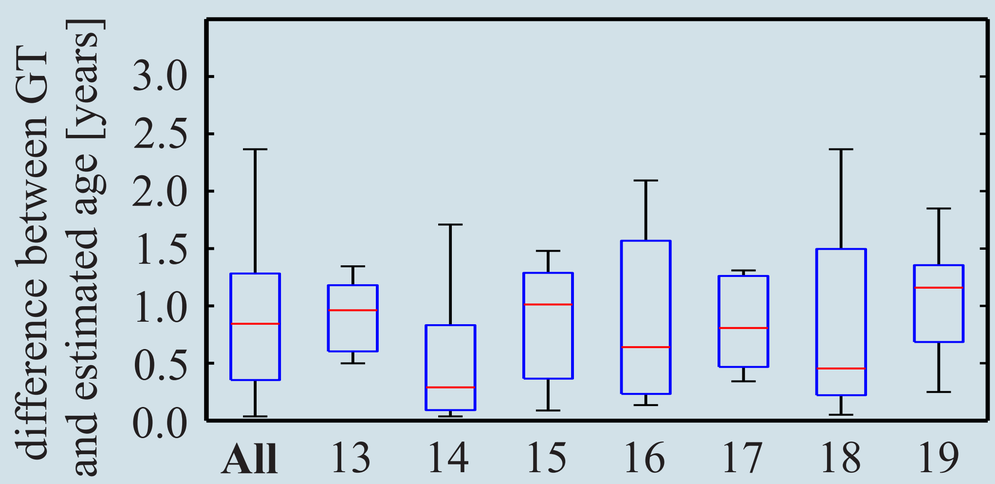
Materials

56 MR images of left hand of the Caucasian male voluntaries equally distributed in seven age groups (7x8 images) between 13 and 20 years.

MRI scan (3T Tim Trio, Siemens Healthcare, Erlangen)
Protocol: T1 weighted 3D gradient echo,
vx size 294x512x72, vx resolution 0.47x0.47x0.9mm^3

A scientist manually annotated 28 anatomical landmarks of the hand bones and additionally the center position of the epiphyseal gap for 11 bones.

Results



The mean difference between ground truth chronological and estimated age was **0.85 ± 0.58** years (leave one out cross-validation).