

Extension of automated bone age determination to the end of puberty

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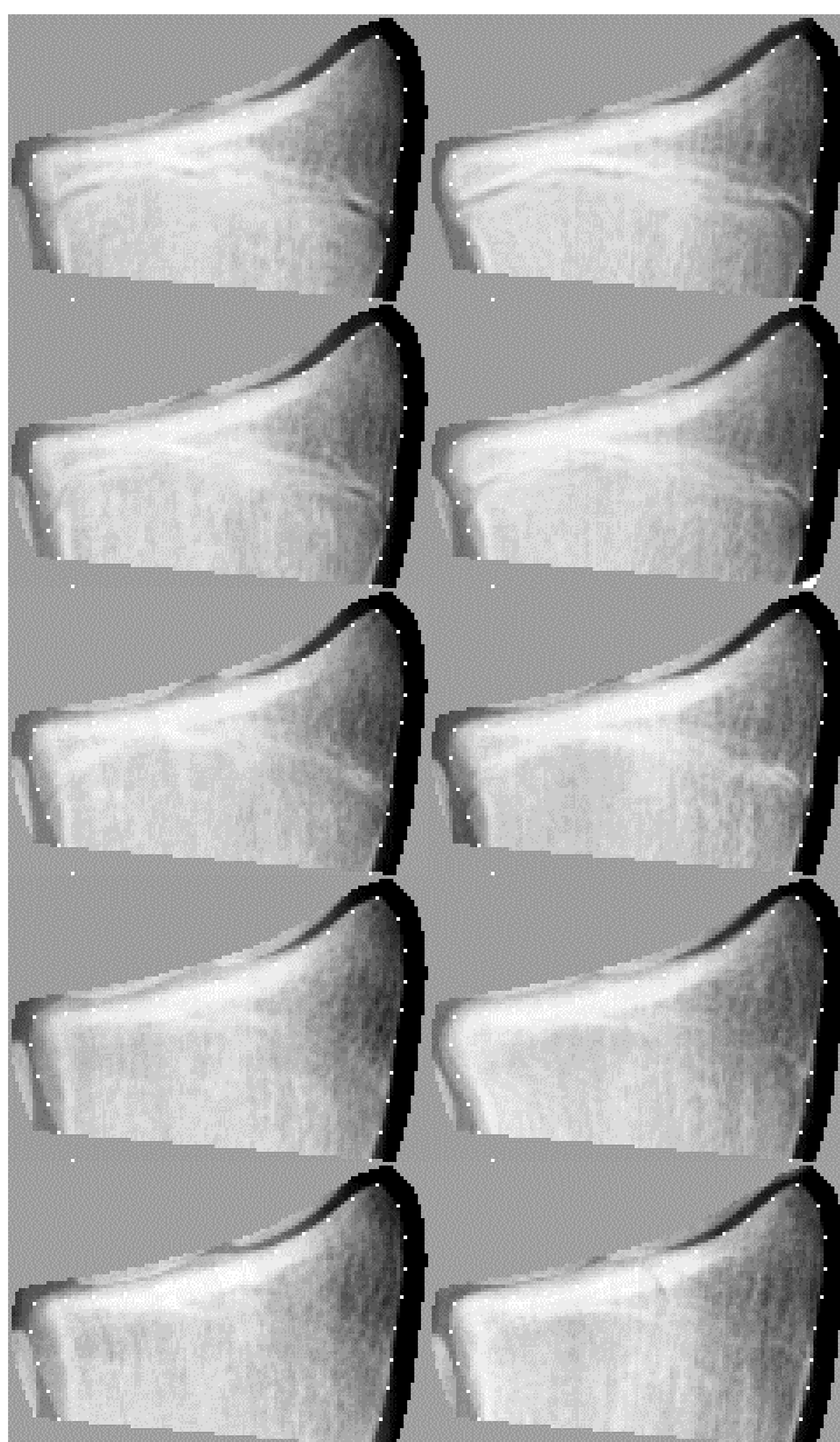
Visiana

Background

The BoneXpert method for automated bone age from hand X-rays was introduced in 2009, covering the Greulich-Pyle bone age range up to 17 years for boys and 15 years for girls.

Aim

To extend the bone age range of the automated method up to 19 years for boys and 18 years for girls and validate it against manual rating.



Results

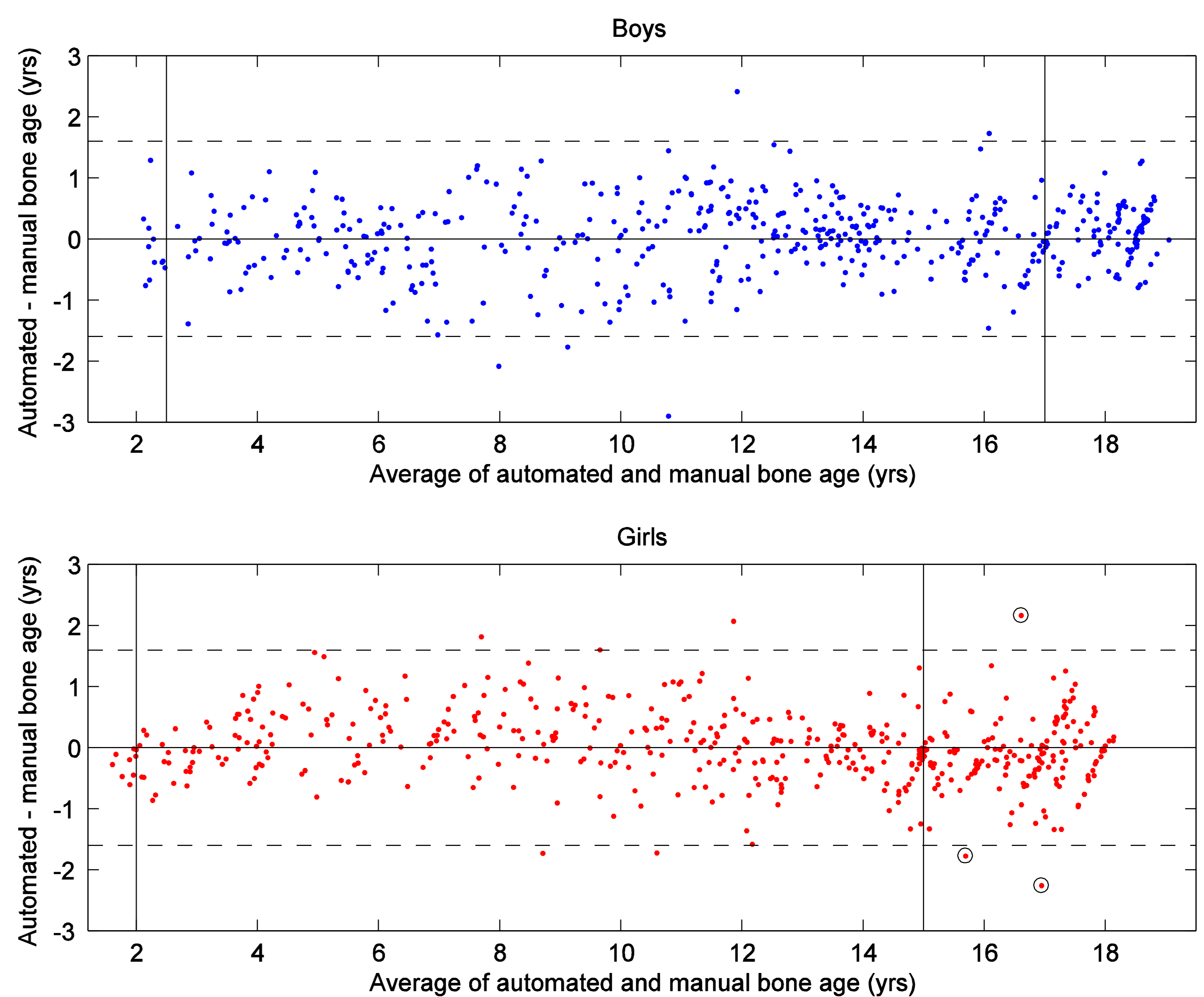
Root-mean-square deviation from manual rating

- Boys in the bone age range 17-19 years: 0.45 years
- Girls in the bone age range 15-18 years: 0.59 years

For girls in the bone age range 17-18 years, the deviations were relatively high, indicating that the Greulich-Pyle scale should perhaps stop at 17 years for girls.

Methods and material

- Developed on images from the First Zurich Longitudinal Study of 231 healthy children born in 1954-56 and followed with annual X-rays of both hands until the age of 20 years.
- Validated on cross-sectional study of healthy children from Los Angeles of four ethnicities. The manual rating is the average of two radiologists' ratings.



Conclusions

The automated method performs bone age rating as well at the end of puberty as in the rest of the bone age range.

The clinical use of bone age at the end of puberty includes:

- (1) Assessment of growth potential, so that GH treatment can be stopped at the optimal time
- (2) Assessment of growth potential in pediatric orthopaedics prior to surgical intervention

Disclosure: HHT is the owner of Visiana, which markets BoneXpert

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