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## Suggested Reference

Zhang, J., Hislop-Jambrich, J., Malcolm, D., Thomas, C. D. L., & Nielsen, P. (2013). One size in no way fits all - quantifying hip variations by automatic morphometric measurements from CT. Poster session presented at the meeting of Radiological Society of North America 2013 Scientific Assembly and Annual Meeting. Chicago, Illinois, USA. <http://archive.rsna.org/2013/13026384.html>

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# One Size in No Way Fits All

## Quantifying Hip Variations by Automatic Morphometric Measurements from CT

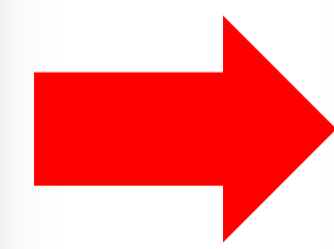
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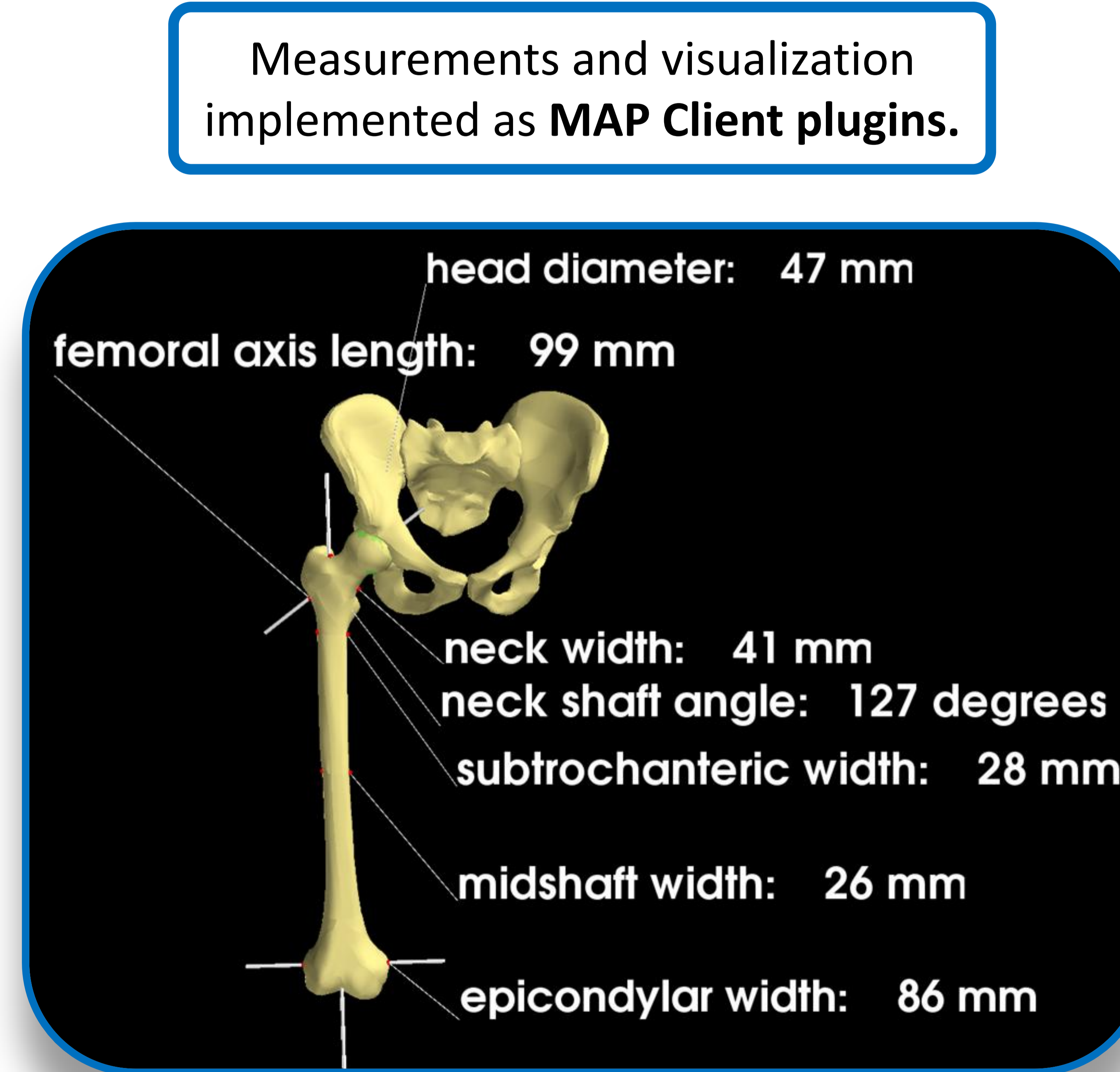
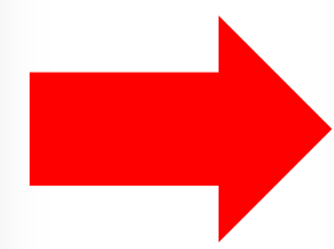
**Femur and hip measurements** have strong clinical and anthropological value. Variability among individuals however makes consistently reproducible measurements non-trivial and time consuming. Automatic CT image segmentation and meshing allow **objective measurements** to be taken as part of an **automated pipeline**.



A 16-row MDCT was used to acquire images of **55 human cadavers** (24 M, 31 F).

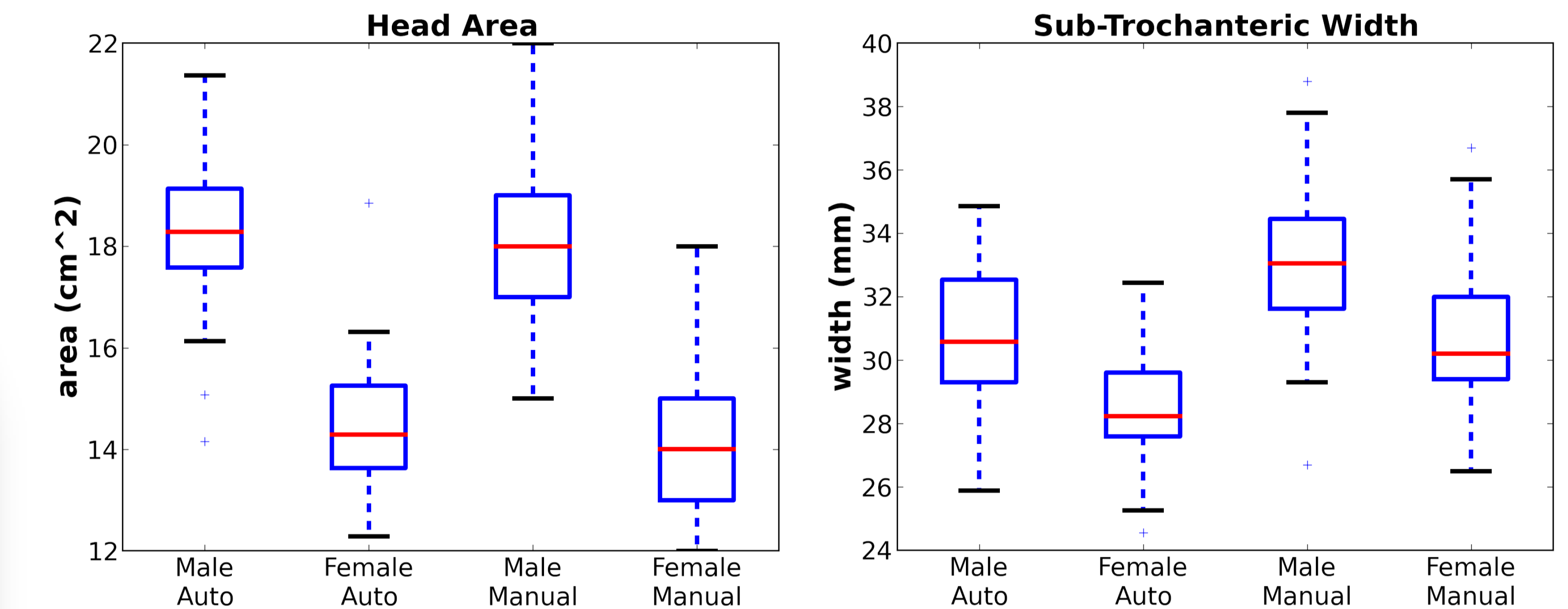


The right femur and pelvis are **automatically segmented and parameterized** using a mesh [1].



Surface measurements are automatically calculated on the mesh, taking advantage of **correspondent landmark positions**.

**Results** Automatic measurements are within 2.4% to 7.6% of manual measurements. All measurements show statistically significant differences between sexes.



**Conclusions** The automated system is sufficiently accurate and sensitive to discern sex variations in hip morphometry. The system will be used to create a bank of detailed hip models and morphometric assessments which can support the development of prosthetic devices and assist in diagnosing complex hip-based disorders.

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**References** [1] Zhang, J., Malcolm, D., Hislop-Jambrich, J., Thomas, C. D. L., & Nielsen, P. (2012). Automatic Meshing of Femur Cortical Surfaces from Clinical CT Images. *Mesh Processing in Medical Image Analysis 2012*, 40–48.