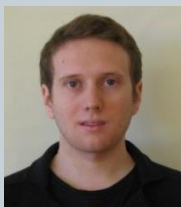


Smart Capture System coupled with a Subject/Patient Avatar for the Supervision of the Human Motion

BENJAMIN ADMONT, KEVIN LEPETIT, ADRIEN LETOCART,



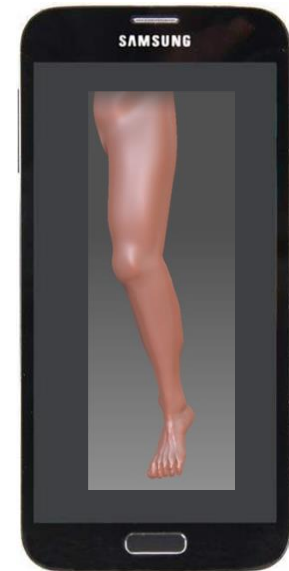
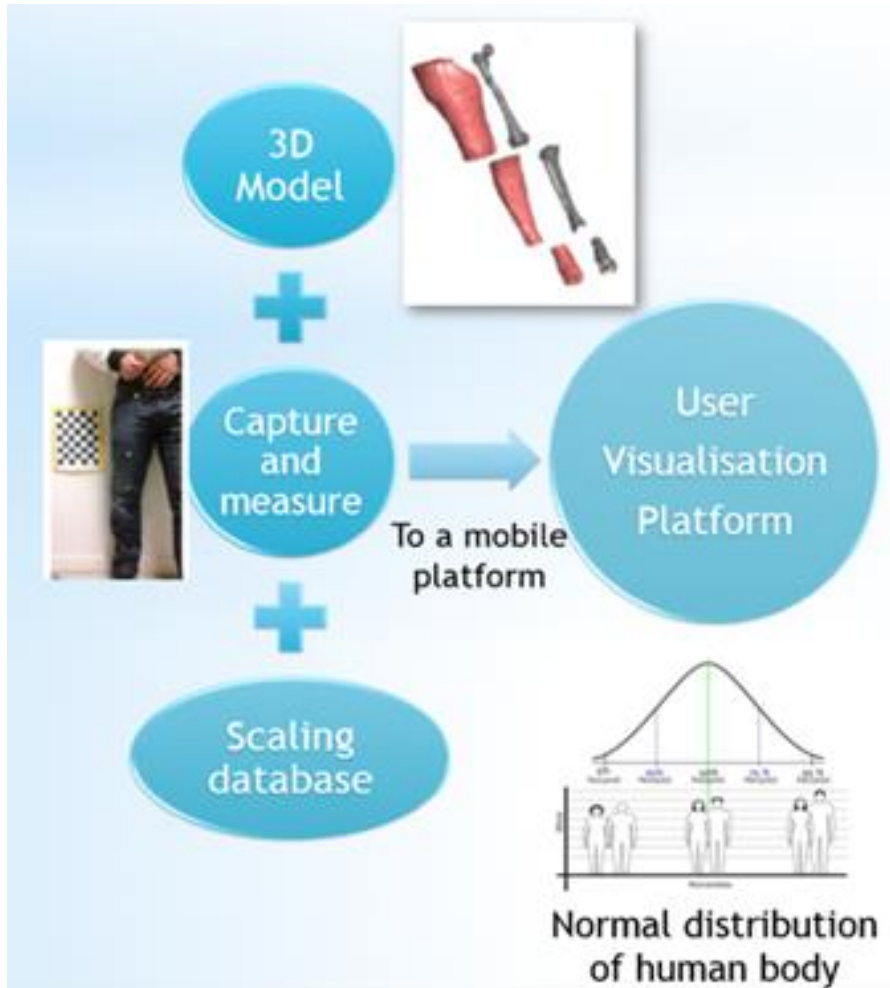
ARSELLE SAIZONOU, ZILONG ZHANG



*SUPERVISED BY :
MARIE-CHRISTINE HO BA THO & TIEN TUAN DAO*

Material and Methods :

2



Results :

3

Measurement protocol
(max. ~error 6%)



Visualization platform
presenting correct custom
3D model



Different view of
customized 3D models
from smartphone screen



Conclusion

4

- A smart capture system → Patient specific avatar representation
- Our System :
 - Accurate
 - Easy-to-use.
- A first step to a dynamic model



Thanks

5

- E – Biomed chair



- See you in front of our poster !



Smart Capture System coupled with a Subject/Patient Avatar for the Supervision of the Human Motion

Benjamin Admont, Kevin Lepetit, Adrien Labocart, Areele Salzonou, Zilong Zhang, Tien Tuan Dao, Marie-Christine Ho Ba Tho

Objectives:

- Develop a smart capture system for lower limb structures
- Patient specific model based on a generic model scaling
- Supervise the motion of the human musculoskeletal system


Method & Material:

Our methodology was based on the following steps:



- 1) Development of a geometrical model of the lower limbs (hip, knee, ankle, muscle)
- 2) Patient image capture and morphological parameters measure (the selection was done on the basis of standard anthropometric manual[1]).
- 3) Scaling generic model according to the normal distribution of anthropometric data[2].

Results

- 1) A generic model was carried out and has been validated (in term of skeletal angle and proportional relationships of lower limbs [3]):

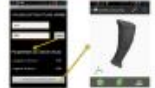


- 2) Camera based measure protocol was developed, maximum error was found to be 6%




Subject	Real thigh length (cm)	Calculated length (cm)
Subject 1	~45	~45
Subject 2	~45	~45
Subject 3	~45	~45
Subject 4	~45	~45
Subject 5	~45	~45

- 3) Visualization platform offers possibilities to visualize patient 3D model



Different views of customised 3D models



CONCLUSION
A functional smart capture system has been developed to create patient-specific avatar representation of the human lower limbs. Our system shows an accuracy lower than 6% and the protocol is user friendly.

References:
[1] Anthropometric Parameters Manual, 2007
[2] Ho Ba Tho et al., 2016
[3] Basic biomechanics of the musculoskeletal system in walking