Mechanical Engineering Technology

GENERAL PRESENTATION

KU LEUVEN

✓ **Complete denomination**: KU Leuven, Department of Mechanical Engineering, Mechanical Engineering Technology, campus Geel

✓ **Location (city, country)**: 2440 Geel, Belgium

✓ **Coordinator:** Luc Labey

✓ **Contact person in NEWGEN**: Luc Labey

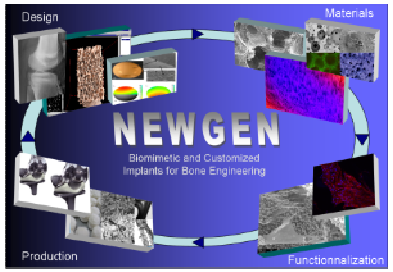
✓ **Working Group involvment**: WG2 and WG4

✓ **Staff**: Luc Labey

✓ **Research topics**: orthopaedic implants and (external) assistive devices and their mechanical interaction with the human body

✓ **Researchers expertises**: in vivo 3D motion capture, in vitro testing with joint simulators

KU Leuven,
Mechanical engineering technology,
campus Geel
Kleinhoefstraat 4
2440 Geel - BELGIUM



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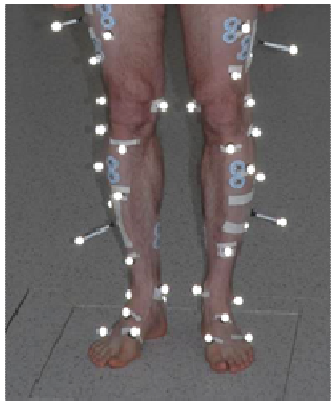
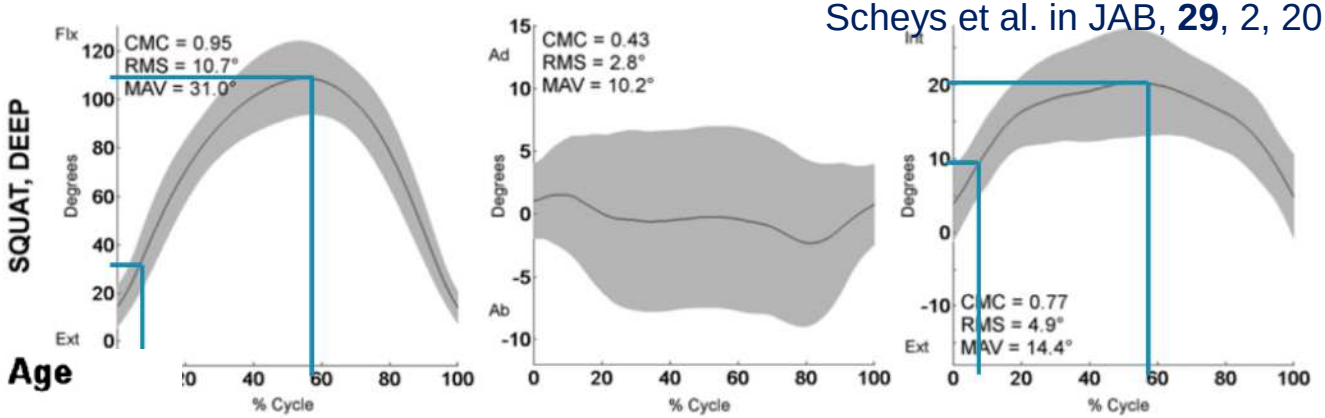
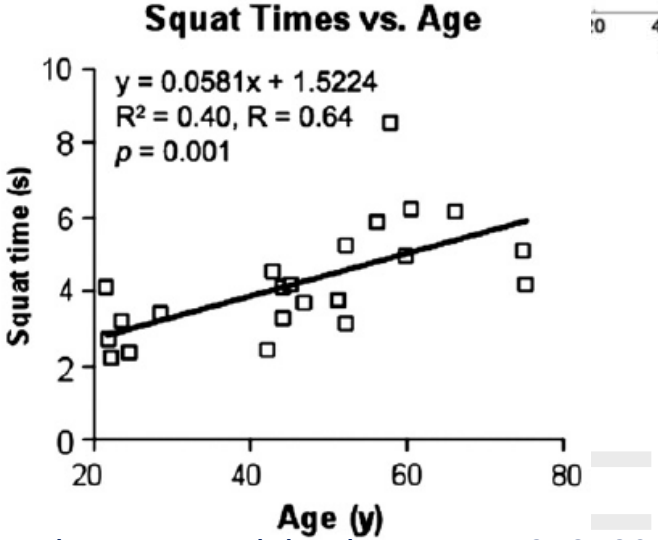


In vivo 3D motion capture to investigate joint kinematics and kinetics (ground reaction forces, muscle activity)
Comparison between healthy subjects and patients (e.g. after TKA).

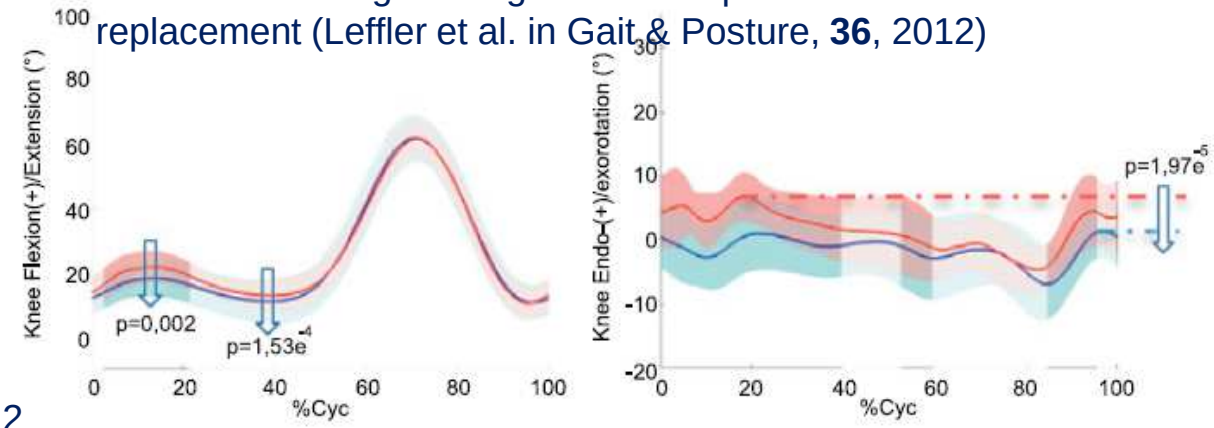
Scheys et al. in JAB, **29**, 2, 2013





Fukagawa et al. in The Knee, **19**, 2, 2012

Kinematics during walking after bicompartmental knee replacement (Leffler et al. in Gait & Posture, **36**, 2012)



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BIOMECHANICS OF ASSISTIVE DEVICES

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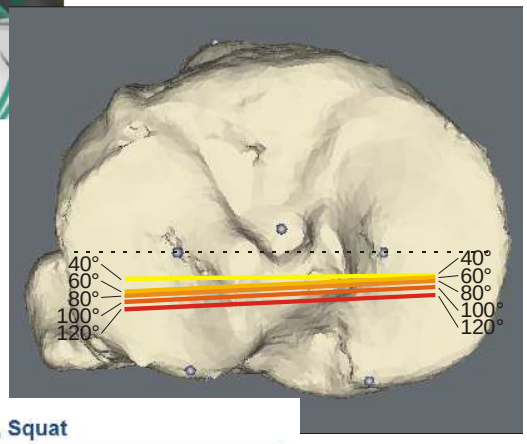
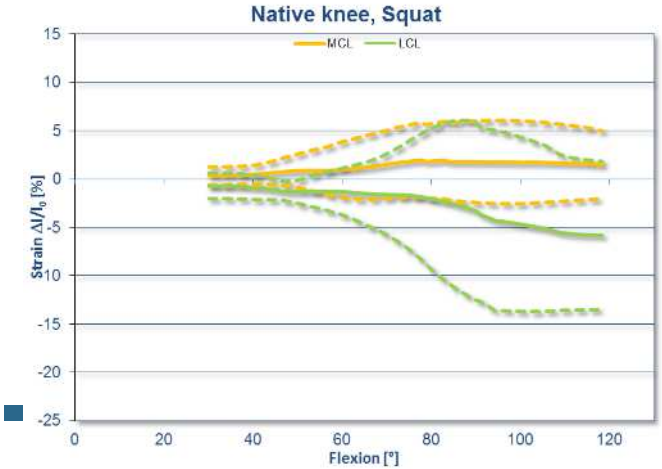
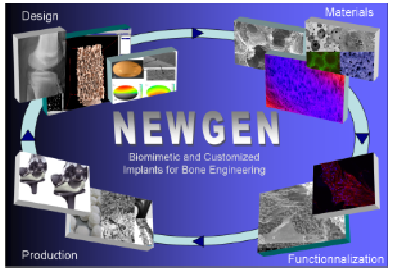
In vitro knee joint simulator to investigate joint kinematics and kinetics (tissue strains, joint contact force and pressure distribution)
Comparison between native cadaver knee and the same knee after surgery.



Knee kinematics in 60 native knees,
Labey et al. in J Biomech, **45**, 2012



Collateral ligament strains during squatting,
Delport et al. in KSSTA, **23**, 8, 2015



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BIOMECHANICS OF ASSISTIVE DEVICES

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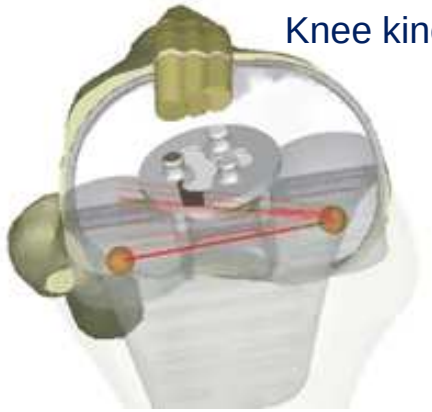
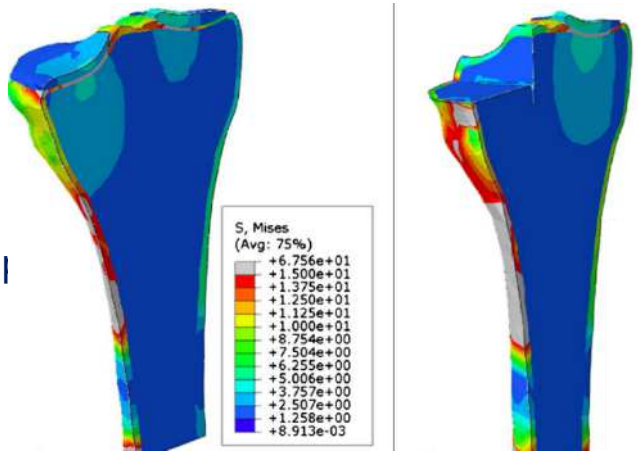
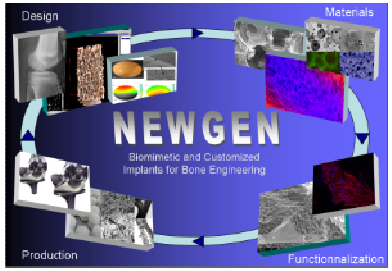
In silico simulation to investigate joint kinematics and kinetics (stress and strain in tissues)
Comparison between native average knee and the same knee after surgery (incl. surgical error).

Knee kinematics after TKA



Bone stresses after UKA, Innocenti et al. in J Arthro
29, 7, 2014





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FACILITIES

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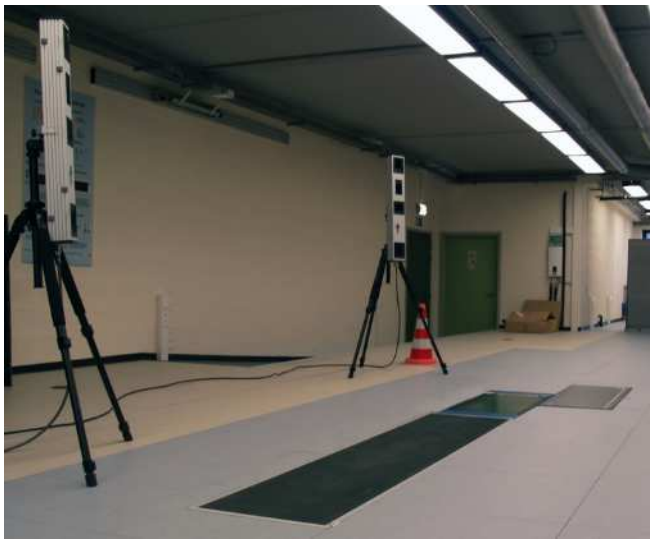
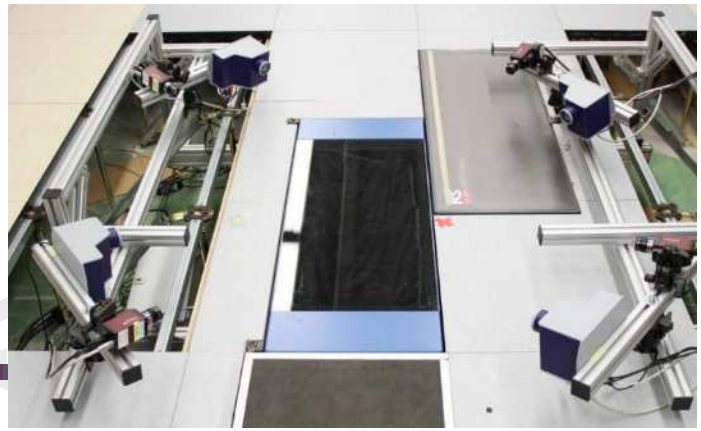
In vivo motion and shape measurements (in collaboration with Mobilab and BMe)

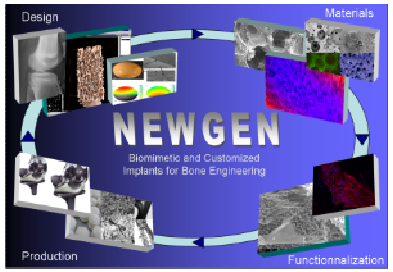


3D motion capture and gait analysis facilities

Vialux, 4D scanner



Diers, dynamic spine and posture analysis



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FACILITIES

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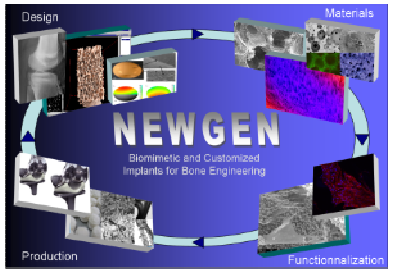
In vitro kinematics and kinetics measurements (in collaboration with Mobilab and BMe)

Knee joint simulator

Foot-ankle simulator

Robotic gait simulator



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