

IDEM203

Biomechanics

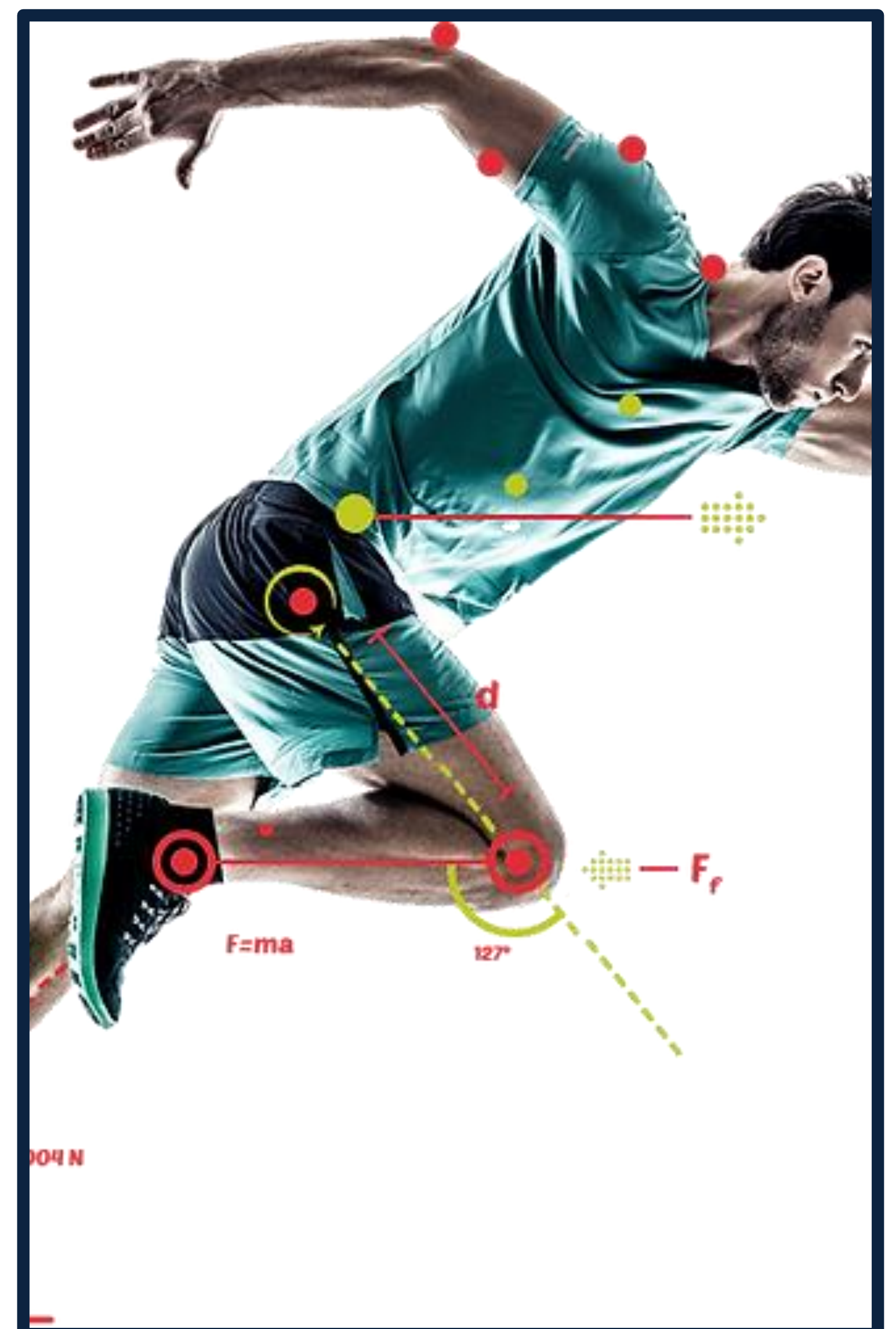
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Digital Human Models (DHM) are computer-based representations of humans that simulate interactions with virtual products or environments. Emerging in the 1960s, DHM has advanced significantly, especially with recent 3D scanning, AI, and computing innovations. It's a vibrant research field, vital for enhancing product function, fit, comfort, and safety in industries like automotive, aviation, defense, fashion, sports, and medicine.

This course explores two key, intertwined DHM areas: 3D anthropometry and biomechanical modeling, particularly focusing on the musculoskeletal system (MSK). Initially, it provides an overview of human bones, muscles, and tendons, along with basic biomechanical principles. Students engage in workshops to learn about various DHM technologies, tools, and data. They will analyze dynamic human-product interactions, optimize them using DHMs, and set up physical studies to validate design choices. Example cases include designing sports equipment, bicycle seats, and respiratory masks. The course also covers tools, supports like chairs and beds, sports braces, wearables, and medical equipment.

Assessment: OpenSim tutorials & Report



Toon Huysmans

