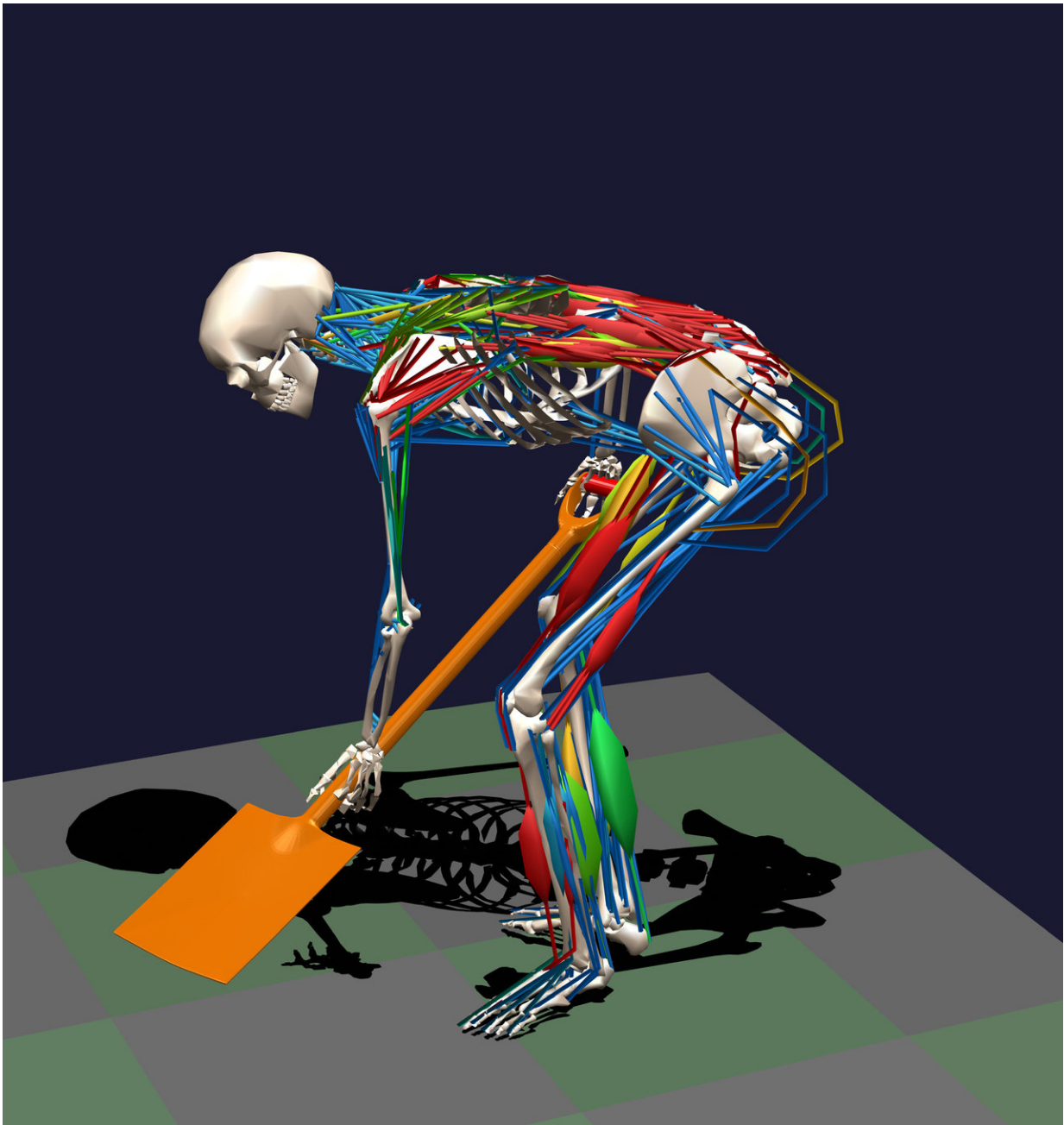


New research reveals how gardeners can dig for health, not injury

January 8 2018



Digging - BAD technique. Credit: Coventry University

New research from Coventry University and the Royal Horticultural Society (RHS) reveals that a bad digging technique can as much as double the load on the joints in the body, leaving people susceptible to chronic injuries.

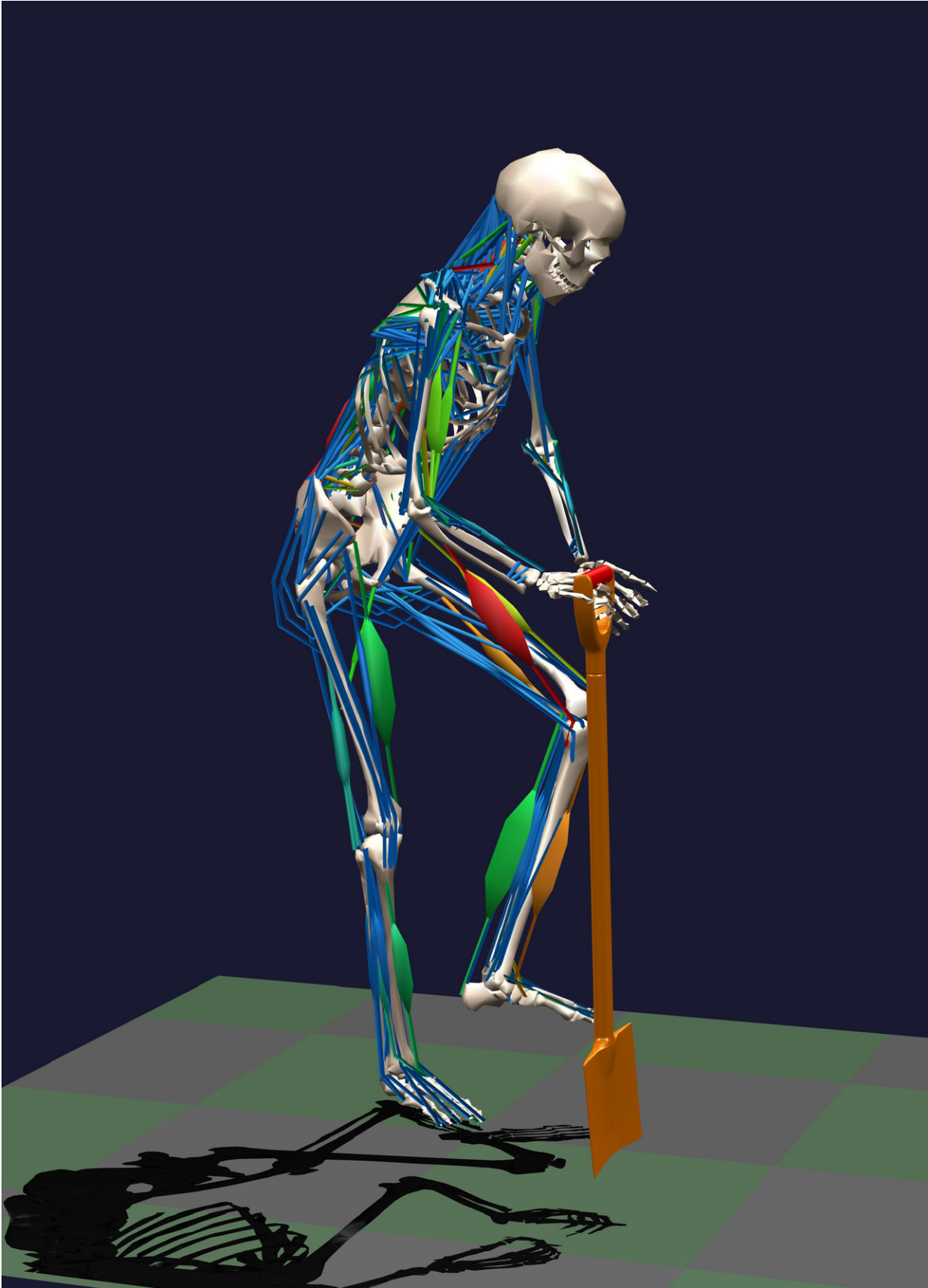
The results, published in the journal *HortTechnology*, reveal the risks that the nation's 27 million gardeners might be running if using a bad digging [technique](#) and comes at a time when more people are recognising the health benefits of gardening.

Coventry University and the RHS employed equipment usually used in the production of animated Hollywood films and advanced hospital laboratories to map the movement of gardeners while digging and measured the loads imposed on the body's joints, bones and muscles.

The 3D optical tracking equipment involved attaching reflective "ping pong" sized balls at key anatomical locations on the gardeners and then surrounding them with high-resolution, high-speed infra-red cameras. This equipment, known as motion capture, allows the movement of the body to be captured digitally enabling the data to then be analysed by BoB – a computer programme developed at Coventry University. BoB contains a model of the human skeleton, major joints and over 600 of the body's muscles associated with movement, enabling the researchers to calculate the internal loads for each participant.

The researchers found that loads in the lumbar region of the back – where many gardeners complain of aches and pains – could be increased

by half as much again for a bad posture. The shoulders were even more sensitive, where more than double the load was generated if a bad posture was used. Large loads at joints are associated with increased risk of osteoarthritis, the most common form of joint disease.



Digging - GOOD technique . Credit: Coventry University

It was also found that good gardening practice involves using a regular, repetitive technique rather than erratic movements. A good technique was found to have minimal back bend and large knee bend whereas a bad posture was characterised by large forward bending, stretching limbs and uncontrolled motion.

Dr James Shippen, an expert in biomechanics at Coventry University's Institute for Future Transport and Cities, said:

This project moves biomechanical analysis into another field. Many of our findings agree with received wisdom on good digging techniques which has been accumulated over many years but now we can provide quantitative evidence to support that opinion on what makes a good digging style.

Dr Paul Alexander, head of horticultural and environmental science at the RHS, said:

Digging is one of the more common gardening practices – whether it be for planting trees, shovelling soil or turning compost – yet we tend to rely upon common sense which can lead to gardeners complaining of aches and pains. Our findings will help us ensure that both amateurs and professionals stay digging for longer; avoiding injury, and improving efficiency.

More information: James Shippen et al. A Novel Biomechanical Analysis of Horticultural Digging, *HortTechnology* (2017). [DOI: 10.21273/HORTTECH03800-17](https://doi.org/10.21273/HORTTECH03800-17)

Provided by Coventry University

Citation: New research reveals how gardeners can dig for health, not injury (2018, January 8)
retrieved 8 May 2024 from

<https://medicalxpress.com/news/2018-01-reveals-gardeners-health-injury.html>

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