



Design research and its applications for ageing populations

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**THE GLASGOW
SCHOOL OF ART**

| JOURNEY |

strictly not come dancing

user responses to visualised dynamic data

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**Innovation in envisioning dynamic
biomechanical data to inform healthcare
and design guidelines and strategy**

RES-352-25-0005

Aim of our research - *Phase 1*

To improve understanding and communication of the stresses on older people's joints and muscles and how these change during - and affect - mobility

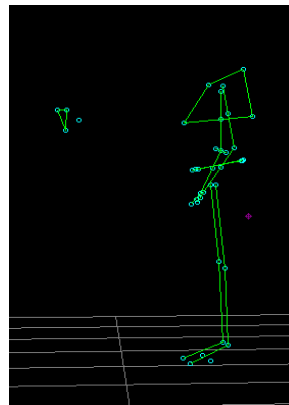
- through a tool that would be useful to the range of professionals involved in healthcare planning, designers, and accessible to lay older people.

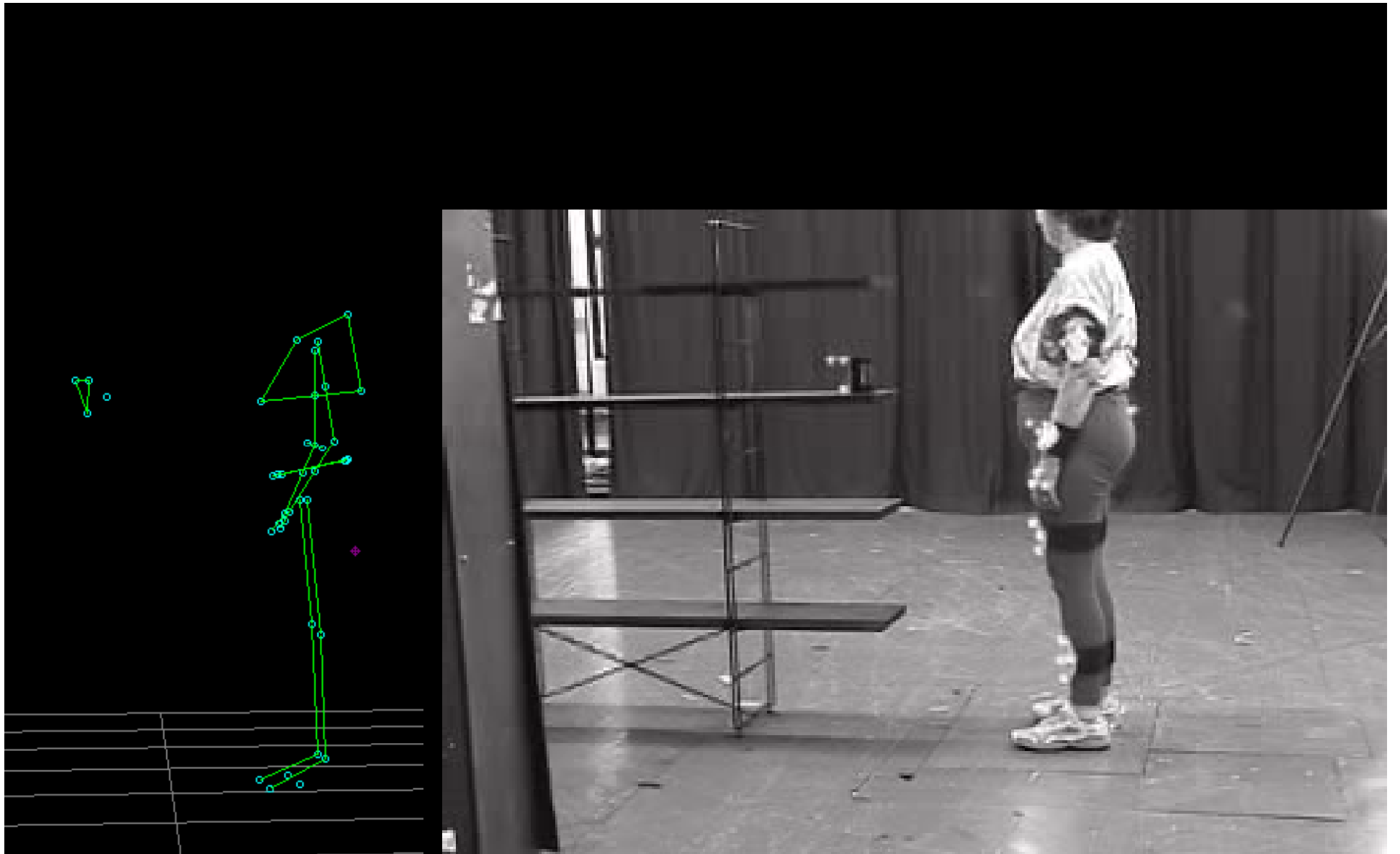
Older people data

- 84 healthy older adults
- 3 age groups
 - 60+ (15 ♀ 15 ♂)
 - 70+ (15 ♀ 15 ♂)
 - 80+ (11 ♀ 13 ♂)
- 11 different daily living exercises
- 900 hours of lab testing

Data capture

- maximum strength measurements
- motion capture
- reaction force measurements

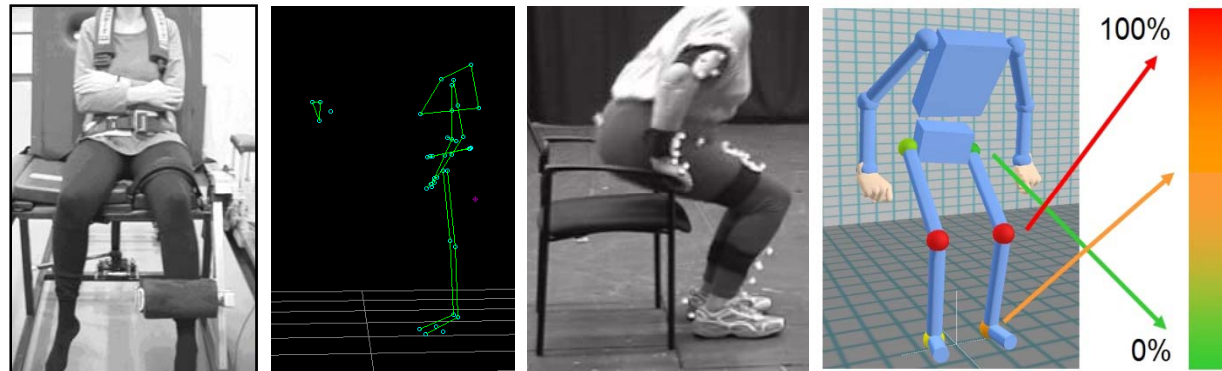


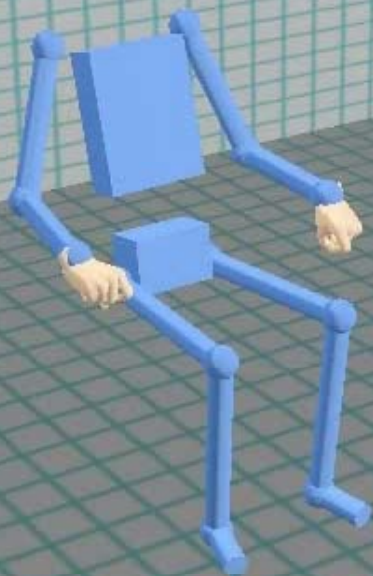


Data capture

Innovation in visualisation

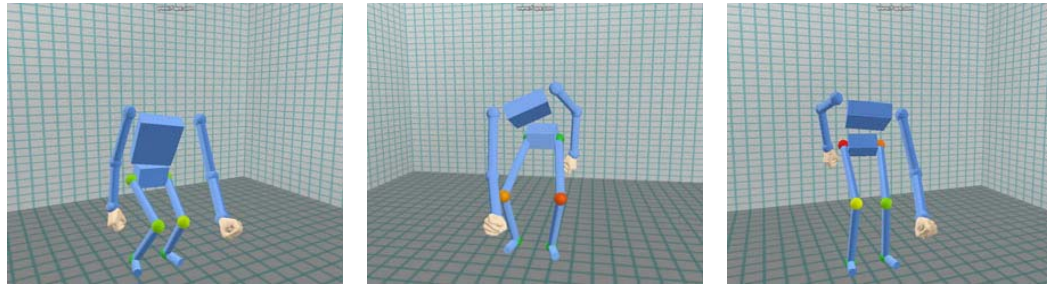
- 3D animated human 'stick figure'
- communication of demand by 'traffic light' concept
- individual - not generalised - data

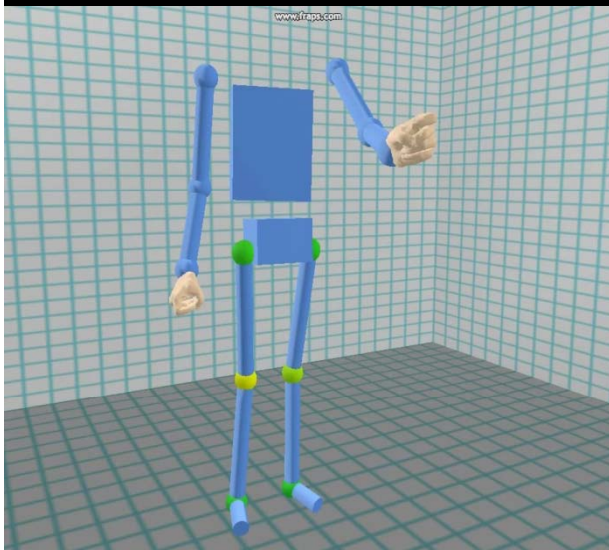




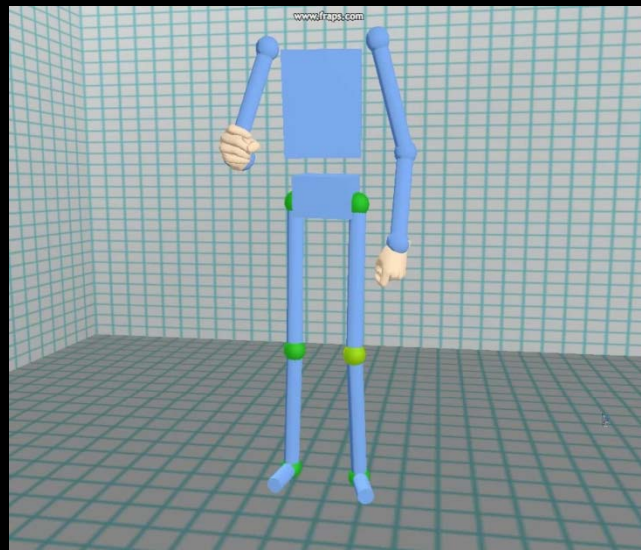
Innovation in visualisation

Comparisons: eg 'normal', knees, hips

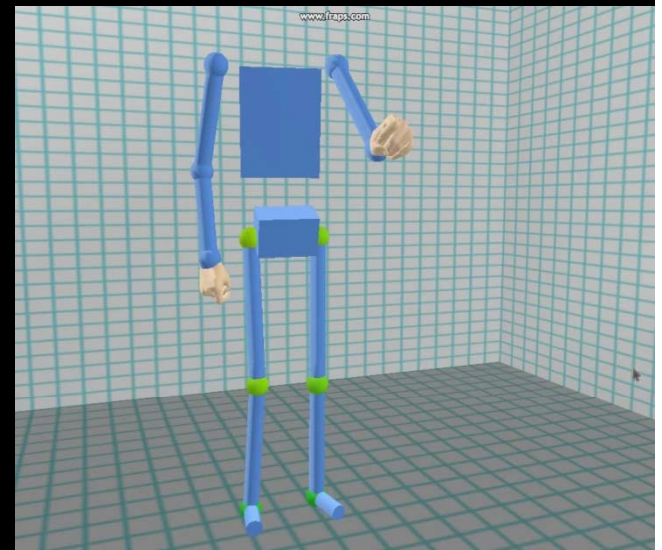




74 year old female
with no problems



81 year old male,
osteoarthritis of
knees



67 year old male,
history of back
problems and history
of fractures

Aim of the project - *Phase 2*

Investigate the benefits and value of the the dynamic visualisation of scientific data relating to stress levels on the joints of older adults.

In particular to explore opportunities to improve communication between and within the professions and with older lay people

2 Research Phases

- Face-to-face interviews
- Series of Focus Groups

Issues arising from interviews

- *prior to animations being shown*

1. *Comments and issues broadly consistent with other studies*
2. *Verified the desire for improved communication*

Provided context and identified topics for focus groups

Focus Groups

Images reproduced courtesy of Autonomi



older adults focus group

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older adults focus group

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professionals focus group

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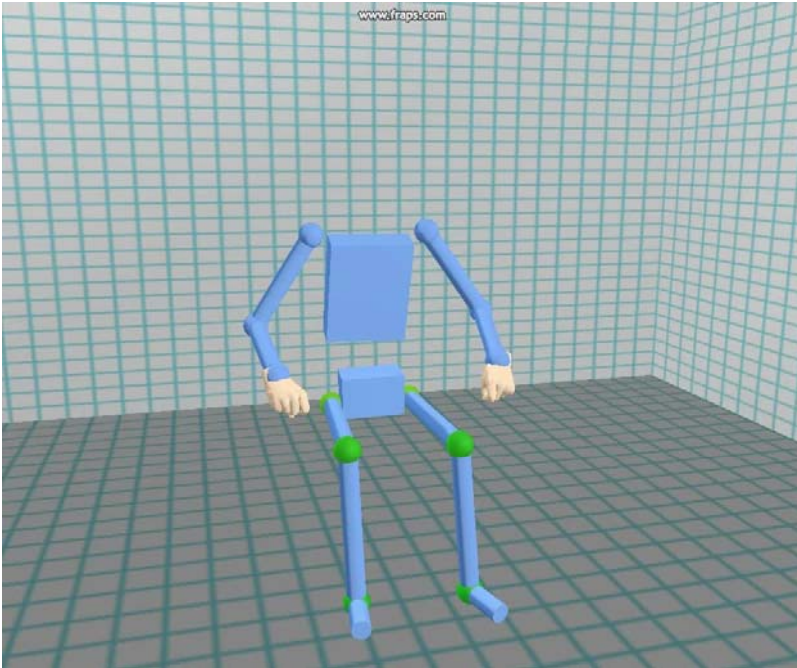


mixed - older people and professionals - focus group

Findings from Focus Groups

- 1) *older people are empowered to participate in the discussion of the problems and issues affecting their mobility and how this impacts on their lifestyle and quality of life*

Older people's perspective



“The hips are more painful than the knees.”

“I see myself getting up and down from the chair.”

“You can tell a doctor but you don’t always feel they’ve quite grasped it.” “ This represents my experience.”

“If they (medical professional) had something to look at it would help.”

Findings from Focus Groups

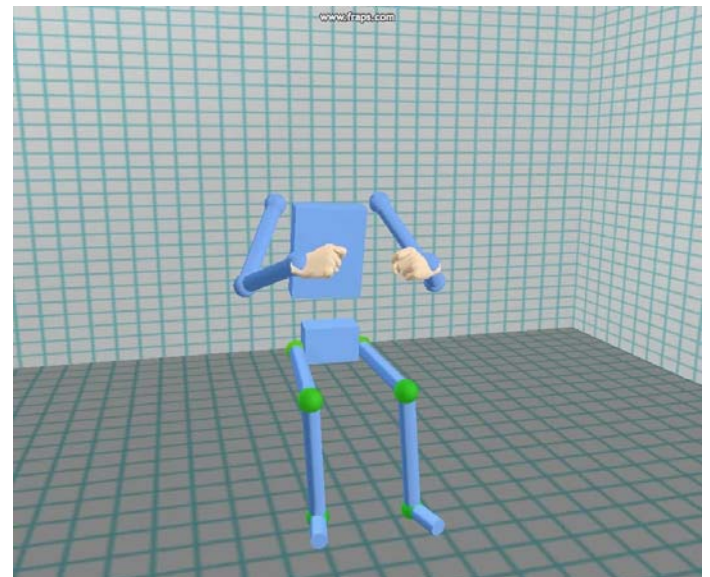
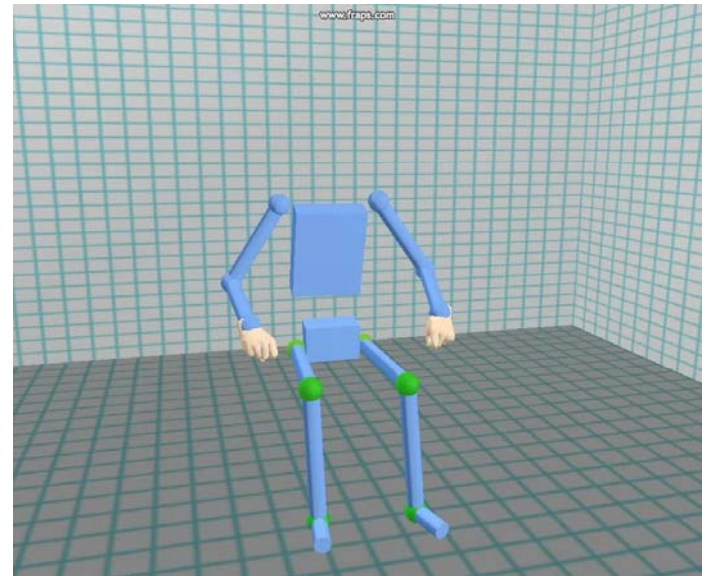
- 2) Healthcare and design professionals could benefit from enhanced communication with older people and across disciplines, allowing a more joined-up approach to healthcare and design planning.*

Professionals

“makes two-way communication very easy.”

“clearly articulates for the health professional and the older person what is going on in the joints.”

“a simple animation allowed open dialogue between a few different professionals...is objective and acted as a focus to discuss mobility...and [didn't] in any way isolate the viewer.”

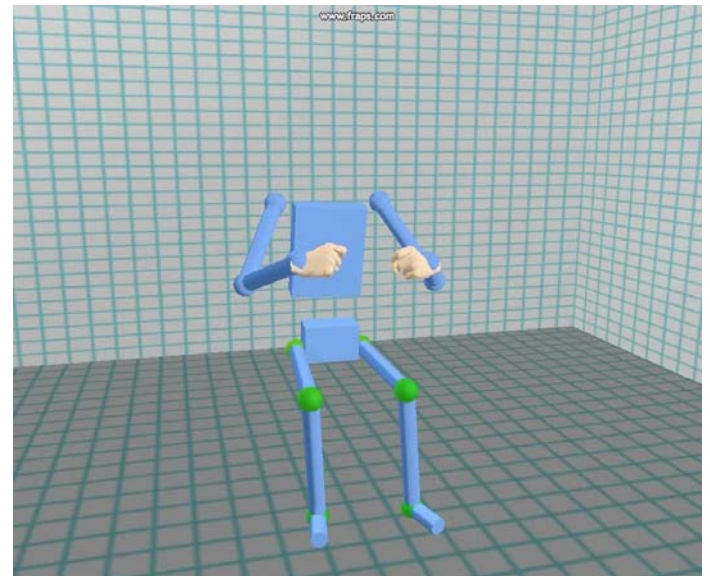
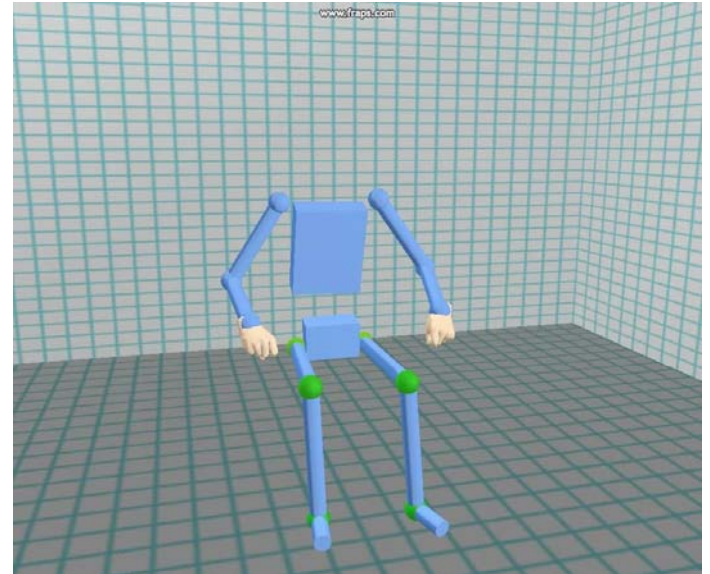


Findings from Focus Groups

- 3) *The visualisations allow a deeper understanding of the issues within professions*

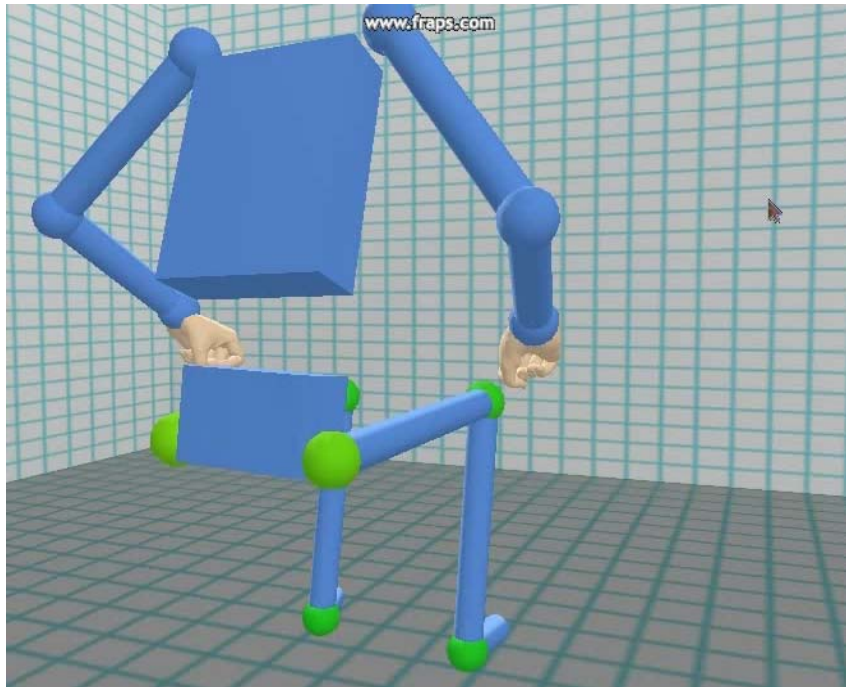
Designer's perspective

“I think it's just really evident immediately why you would, for example, give someone arms on chairs - without having to have some person try it, and see for themselves that this doesn't work. This demonstrates for the first time that there are clear reasons why you would do that.”

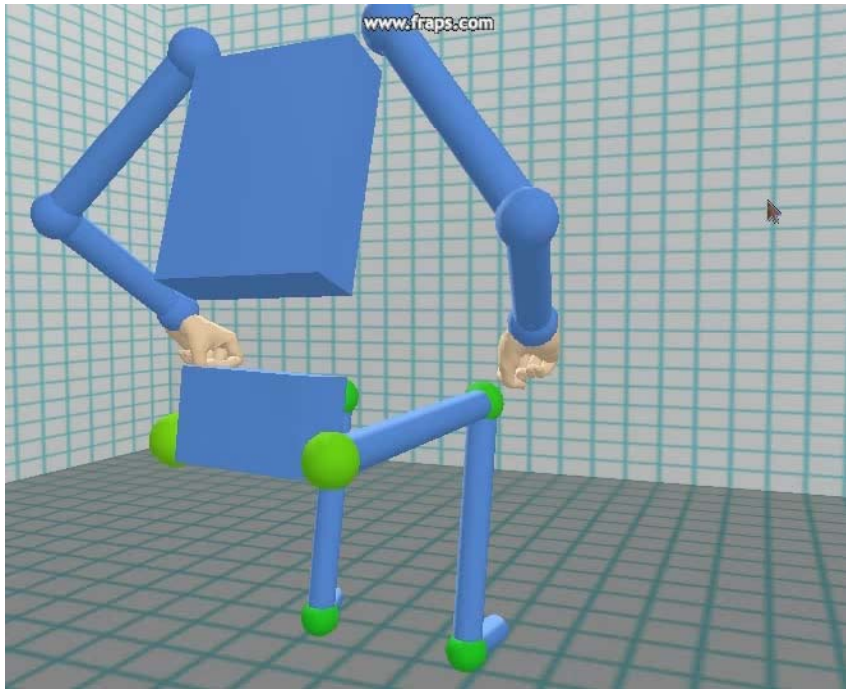


Design Engineer

“...quite a good tool in order to test new ergonomic seating that comes on to the market, like bus seats...or maybe armchairs within a care unit, where a lot of time is spent [seated]...lot of it [the design approach] is really a bit hit or miss, where you tweak a chair slightly without really fundamentally knowing if it's going to suit for the masses.”



Physiotherapist's perspective

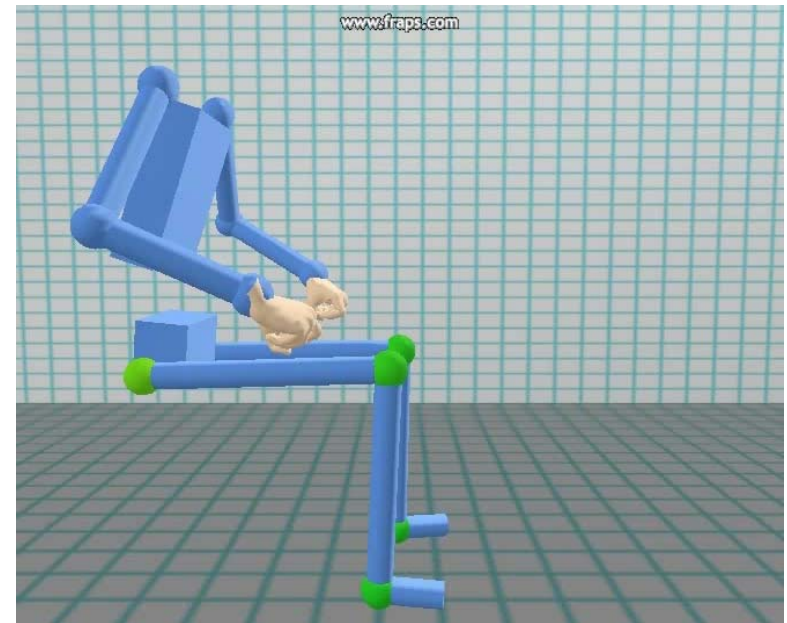


“It's a very clear indication of what's a normal movement pattern, and what's an abnormal movement pattern. And the compensations that you make when you have a problem... and how you have to compensate, both in the speed of the movement and quality of the movement.”

Physiotherapist's perspective

“...from a clinical perspective, when you're looking at someone's movement...it's very difficult to locate where the stresses and strains are, and it's more of an intuitive skill than anything else

...clothing can completely disguise how people move, and when you put it into a tool like that, it becomes very explicit where the movement components are.”



Summary of Findings from Focus Groups

1. *viability of this mode of visualisation of data endorsed*
2. *opportunities to enhance dialogue between professionals and older people and between and amongst different professional groups*
3. *opportunities revealed for change in practice and protocols*

Next stages

- Compiling and disseminating full findings
- Exploring 'next generation' version of the tool
- Exploring best applications for healthcare planning and design

Acknowledgements

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