Sizing up Australia

SHARP

The Next Step

Defining the Method and Scientific Parameters for the Australian Body Sizing Survey

Hometrica Conference

Daisy Veitch, Chang Shu & Kath Robinette

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Safe Work Australia - SWA project sponsor

Concerns about safety in design and outcomes of poor design on worker health and safety

ICODATA ISU

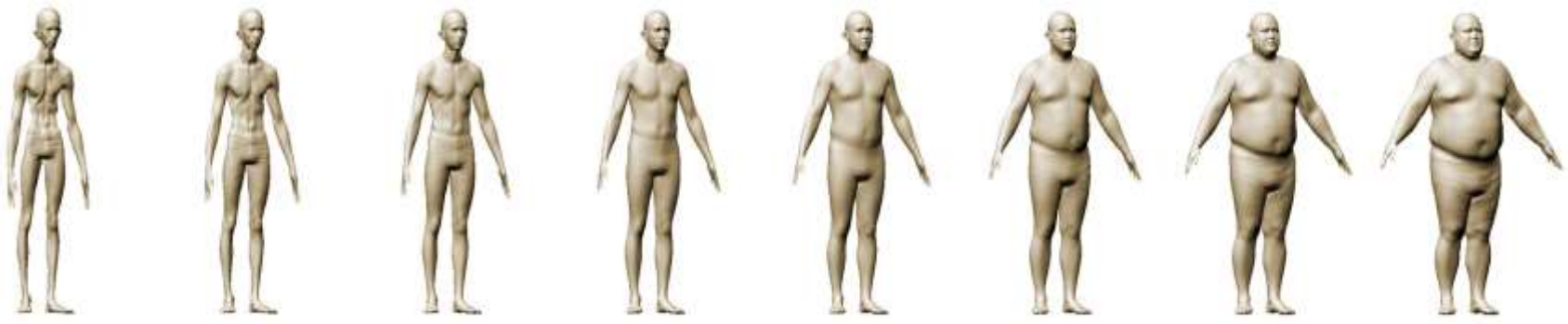
World Engineering Anthropometry Resource

About this presentation

- Research questions?
- Evidence based
  - Application and use of anthropometry (WHS) – how can it add value?
- Stakeholder driven
  - What the survey would give us?
  - Usefulness of types of surveys
- Project outcomes

Research questions

1. What should an anthropometric survey deliver?
2. What components make it useful?
3. Aspects of the project need “measure of goodness” tests – will it work?
4. Will it be fit for purpose?



Project Method

- Literature review
  - published and grey literature
  - International practice
  - ISO standards
- Defining the method and scientific parameters for the Australian Body Sizing Survey thus
  - outlining the factors influencing budget and resources

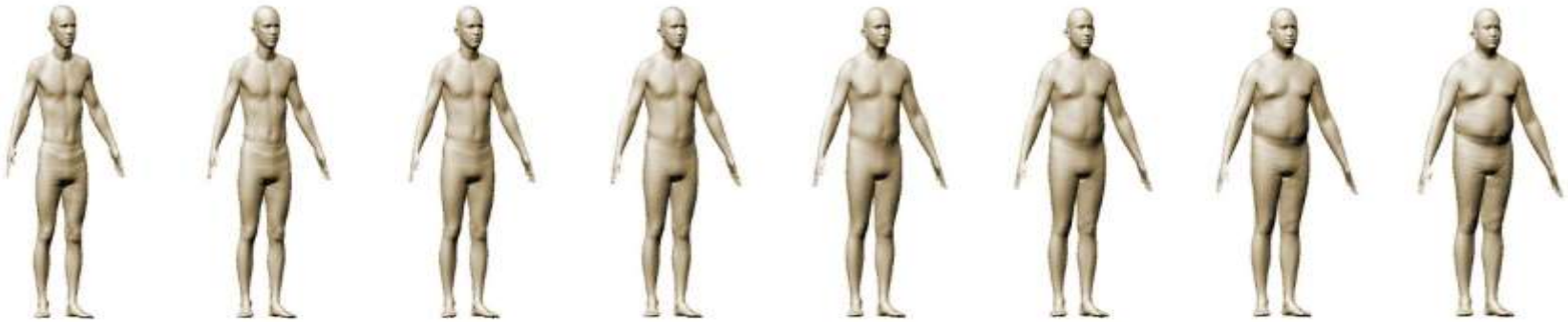
Engineering / design anthropometry

SCOPE – is it fit for purpose?

- Design and assessment of:
  - Worn products
  - Built environments
- Uses in engineering, ergonomics and design include:
  - Maximum benefit and capability of products
  - Checking early product design at concept stage
  - Evaluation of existing designs and work spaces

Types of anthropometric data

- 1-D
- 3-D
- 4-D dynamic data
- Fit metrics
- Fit mapping



Stakeholder driven
What do designers want?

- Deliver outcomes that are evidence based
- Anthropometric data that are*:
  - Reliable - represent user population
  - High quality - including 3-D and 1-D
  - Accessible - on-line preferred
  - Affordable
- Applications eg case selection, simulations…

*Robinette, K. (2004). Case Study of Cost Benefit Analysis for Anthropometry. WEAR Dayton. Dayton, USA.

Use of anthropometric data

- Evaluation of new designs – 1-D and 3-D data used together
  - can best be represented by ***cases*** that uses a combination of body measurements
  - e.g. average or extreme measurements from a sample,
- Evaluation of existing design
  - design parameters relative to fit, function and safety
  - identification of designs that exclude or are biased towards workers of with particular body size attributes

Surveys and usefulness for engineering design

Ability to accurately predict future body shape and size	Technical Solutions summarising different possible approaches			
	Extra High		**High Precision; High Cost; High Future Potential, Extra-High Usefulness for Industry and Government**	➢ 1-D (traditionally) + 3-D using manual landmarks ➢ 3-D fit metrics in the product = fit-mapping study with stakeholders ➢ 4-D dynamic data ➢ Buy scanner, calipers and tapes. (first time this type of survey will be done)
	High	➢ 1-D (traditionally) using manual landmarks ➢ 3-D scans ➢ Lease scanner	➢ 1-D (traditionally) + 3-D using manual landmarks ➢ Buy scanner, calipers and tapes (like CAESAR).	
	Low	➢ Fully automated 3-D scans which extract 1-D ➢ Buy scanner like TC2 (like SizeUK and Size USA)	➢ Collect 1-D (traditionally) using manual landmarks ➢ No scanner (like ANSUR, many older surveys)	
		Low	Medium	High
	Expenditure			

Findings

- Key areas for a high quality effective survey
  - Traditional style 1-D and 3-D data types provide different information and both are essential
  - new 4-D (high quality 3-D scans captured while the subject is in motion) could provide a cost effective way to capture fit information
  - Early stakeholders engagement is vital
  - ISO Standards provide basic templates but they are not sufficient
  - A systems-engineering approach balancing technical factors, cost, time, and needs, is required

Sizing up Australia - The Team

Ms Daisy Veitch – Chief Investigator

SHARP Dummies Pty Ltd, Adelaide, Australia

Mr Chris Fitzgerald – Chief Investigator

Risk & Injury Management Services Pty Ltd, Melbourne, Australia

Dr Verna Blewett – advisor and report editor

Central Queensland University, Appleton Institute, Adelaide,

Mr Steve Ward – supported literature review and editor

University of New South Wales, Sydney, Australia

Dr Chang Shu – advisor and mentor

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Professor Kathleen Robinette – advisor and mentor

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Daisy Veitch
daisy.veitch@gmail.com