



Making the Most of AT...

...From Chairs to Stairs

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Introduction

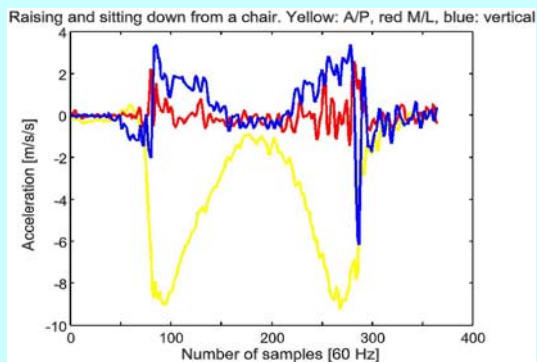
- It is generally accepted that it is best for older people to stay in their family homes for as long as possible (Royal Commission on Long Term Care, 1999).
 - This can be achieved by a combination of care, home modifications and AT
- But...
- How well do people achieve ADL with home modifications and AT? In other words, are people making the most of their AT?

Measuring Performance

- The aim of the project was to develop a portable system, based on body-mounted triaxial accelerometers and gyroscopes (Xsens, The Netherlands) a PDA (personal digital assistant) used as data logger and proprietary analysis software written in Matlab, to conduct ecological studies.

Overview

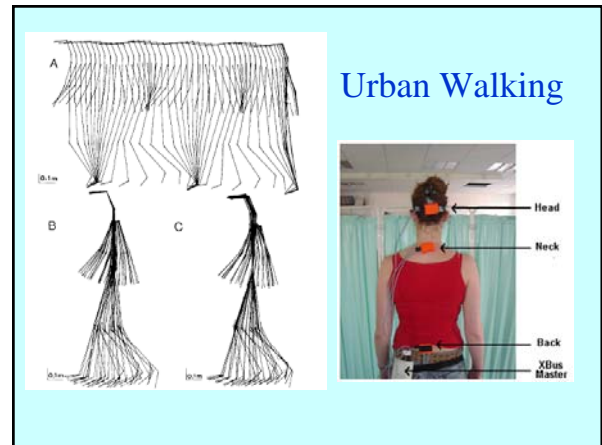
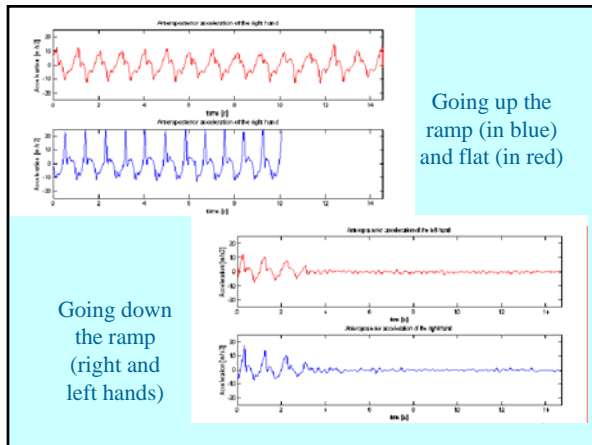
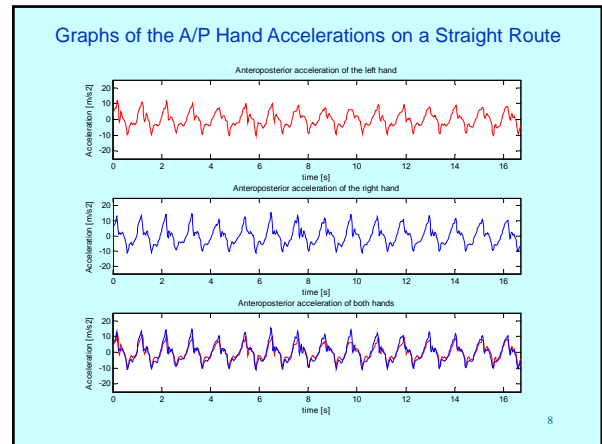
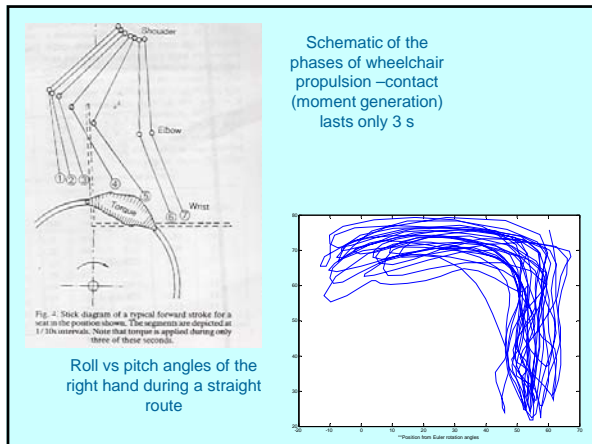
- Sit to stand
- Wheelchair self-propulsion
- Urban walking
- Stair climbing
- Stair climber
- Barriers to making the most of AT



Single triaxial accelerometer placed on the small of the back

Wheelchair Self-propulsion

- Sensors placed on both upper limbs,
- Differences on different surfaces
- Ascending and descending slopes
- This is work in progress to best highlight the features of the self-propulsion cycle under different rolling conditions.

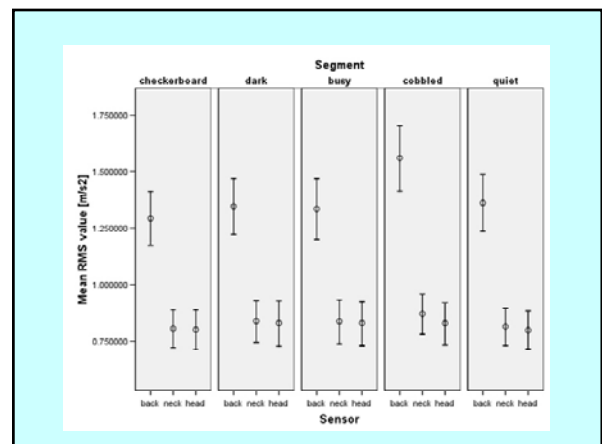


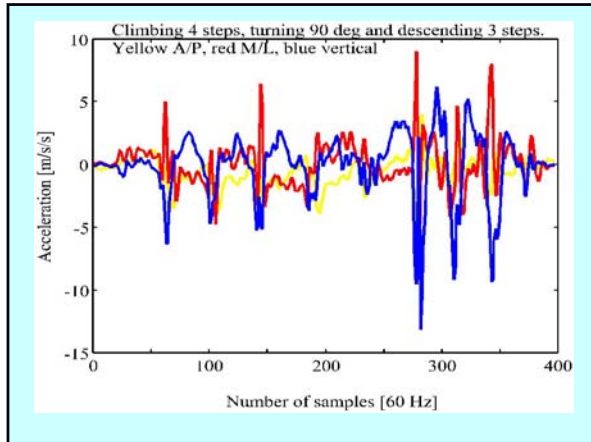
•Five data sections of 30 m (within 41 sections)

- quiet
- dark
- busy
- cobbled street and
- checkerboard floor

•The outcome was RMS of ML acceleration normalised to the subject's average velocity

Test Protocol





ASCENT								
Swing leg	WT	PO	FC		FP			
Stance leg	WA		PU	FCN				
	Double support		Single support					
Young	0%	11.50%	17%	24%	30%	43.50%	50%	
	Initial contact		Heel off	Mid swing		Initial contact		
Old	0%	10%	16%	24%	31%	40%	50%	

DESCENT								
Swing leg	WT	PO	FC		FP			
Stance leg	WA		FCN		CL			
	Double support		Single support					
Young	0%	7.50%	15%	29%	38%	44%	50%	
	Initial contact		Heel off	Mid swing		Initial contact		
Old	0%	15%	20%	29%	38%	42%	50%	

		Non HR users (N=12)		HR users (N=15)		Paired T test
		RMS Mean (m/s ²)	RMS S.D. (m/s ²)	RMS Mean (m/s ²)	RMS S.D. (m/s ²)	
Head	Ascent without handrail	2.36	0.49	2.62	0.88	0.37
	Ascent with handrail	2.67	0.84	2.88	0.85	0.53
	Descent without handrail	2.44	0.75	2.79	1.00	0.33
	Descent with handrail	2.60	0.65	2.96	0.93	0.26
Trunk	Ascent without handrail	2.24	0.40	2.68	0.47	0.02*
	Ascent with handrail	2.06	0.38	2.49	0.48	0.02*
	Descent without handrail	2.74	0.54	3.20	0.63	0.06
	Descent with handrail	2.68	0.50	3.16	0.69	0.05*

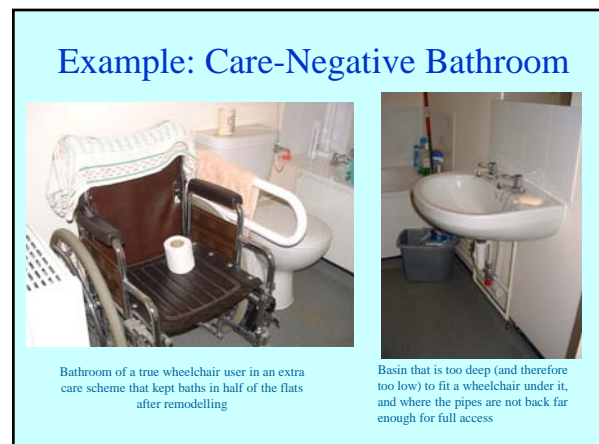
Descriptive statistics for handrail and non-handrail users and subgroup differences for mean acceleration RMS at the trunk and head. * P<0.05



What is Care Neutral?

- A building is **care-neutral** if it does not have any impact on the support and care regime that the building supports;
- A building can be regarded as **care-positive** if its inclusive design allows or even encourages the independence of its tenants;
- A building is **care-negative** if its poor, inaccessible design has adverse quality of life ramifications for the tenants or increased cost implications for the service provider.

Prof. Julienne Hanson 2007



Discussion

- AT alone cannot breach environmental gaps
- To make the most of AT we first need to have a care-neutral (or preferably care positive!) environment
- AT developed used user-centred approach
- Portable, ideal for ADL/AT assessment
 - Inexpensive
 - Allows measurement of many activities
 - Allows long term measurements



Questions?

