

Analysis of tri-axial accelerometer data of 4 month old infants

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Abstract

The main goal of the project is to extract physical activity levels from tri-axial accelerometer data, taken of 4 month old infants. Infants wore two accelerometers, one on the torso, other on the ankle, for 48 hours in a free living environment. In order to properly extract physical activity, the accelerometer data has to be prepared and preprocessed. Preparation includes data organization and timestamp alignment, while the preprocessing includes filtering, averaging, removal of data where the accelerometer was not worn, summary measure extraction, correction for gravity component and correction for acceleration contributed by the infants caretaker. Several approaches are discussed and presented along with the problems and negative features of each. The results from the correction of accelerations due to infant being moved are compared against the diary notations of infants sleeping and feeding habits, kept by their mothers. In the end, physical activity levels are extracted and analyzed along with other variables.

over all	mean of summary		mean SD of being moved blocks		variation of SD of being moved blocks	
	torso	ankle	torso	ankle	torso	ankle
mean	-2.362e-13 g	2.099e-12 g	0.0065 g	0.0131 g	0.0045 g	0.0065 g
sd	0.0061 g	0.0112 g	0.0011 g	0.0020 g	0.0010 g	0.0023 g
min	-0.3132 g	-0.3134 g	0.0044 g	0.0103 g	0.0033 g	0.0040 g
max	0.3348 g	0.3551 g	0.0092 g	0.0183 g	0.0072 g	0.0148 g

newline

average torso min of SD = 0.0013g
average torso max of SD = 0.0237g
average ankle min of SD = 0.0021g
average ankle max of SD = 0.0338g

References

Supplements

Example of a diary kept by the infants mother.

Monitor Dagbook

Anmärkningen gäller:			Togs av:		84P071B	Togs på igen:	
Actiheart	Acti-Mini	GENEA	Datum	Kl.		Anmärkning	Datum
			12/3	8 ⁰⁰	Troxam var blöt, pga läkande blöja...	12/3	15 ³⁰
			12/3	1245	Tog bort båda monitorerna		

Startdatum: 11/3 Kl. 10⁰⁰
 Stopdatum: 21/3 Kl. 10⁰⁰

Monitor Dagbok

Anmärkning gäller:			Togs av:		Anmärkning	Togs på igen:	
Actiheart	ADT	GFMEA	Datum	Kl.		Datum	Kl.
X			13/3	08.30	Sov utom	13/3	09.00
X			14/3	00.10	— 11 —	14/3	09.25
X			15/3	00.25	— 11 —	15/3	09.50
X			15/3	23.45	— 11 —	16/3	09.40
X			16/3	23.40	— 11 —	17/3	06.45
		X	16/3	23.40	— 11 —	17/3	10.45
X			17/3	22.35	— 11 —	18/3	08.50
X			18/3	22.40	— 11 — + glömda	19/3	12.15
X			19/3	22.25	— 11 —	20/3	10.15
X			20/3	23...	— 11 —	21/3	8. —
X		X	21/3	10 ⁰⁰	SLUT ☺		

Sovschema

Studiekod: **84P077B**

Instruktioner:

Markera med ett streck vid vilka klockslag och under hur lång tid ditt barn sover (enligt exemplet nedan) under de 5 efterföljande dagarna till erat besök.

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Mån																								

Datum: 090312 00⁰⁰

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Mån	5																							
Tis																								
Ons																								
Tor	1																							
Fre	2																							
Lör	3																							
Sön	4																							

Anmärkingar/förtydliganden:

Dygn (1-5): 1 12/3 00⁰⁰

[illegible]

Studiekod: _____

[illegible]

Dygn (1-5): 3

[illegible]

Dygn (1-5): 4

[illegible]

Dygn (1-5): 5

[illegible]

Kompletterande uppgifter

Efter femdagarsperioden vill vi att Du antecknar två saker:

- 1) Om detta varit fem vanliga dagar eller om det hänt något speciellt (sjukdom, resa etc)

Har ungefär varit som fem vanliga
dagar. Dag 4 verkade mte
bättre ~~men~~ än att lite mindre.

- 2) Om Du undvikit något livsmedel till barnet pga misstanke om allergi/överkänslighet.

