



UCL

CAPABLE

Children's Activities, Perceptions and
Behaviour in the Local Environment

Kay Kitazawa, **CASA**

CAPABLE



- Where children go?
- Where children become active?
- Where children play?
- What kind of transport mode they use?



- Physical fitness
- Autonomy
- Parental attitude
- Spatial cognition ability
- Knowledge of local area

CAPABLE

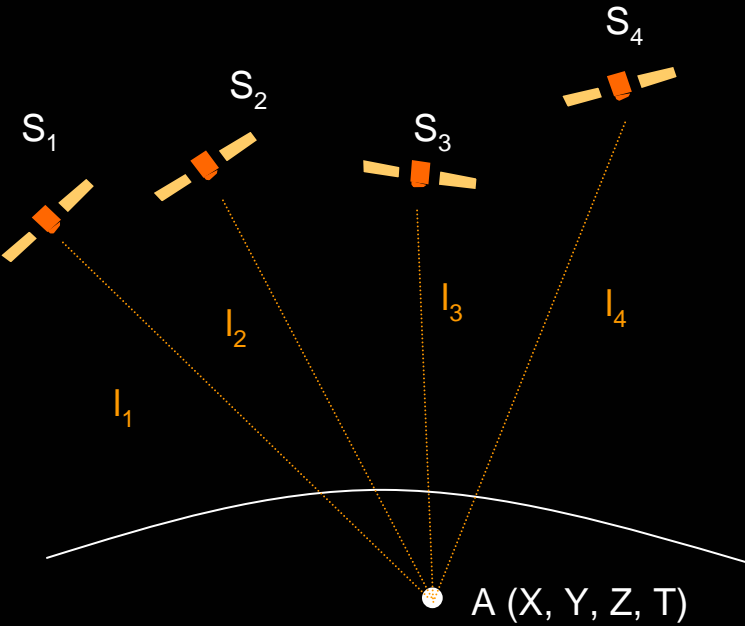
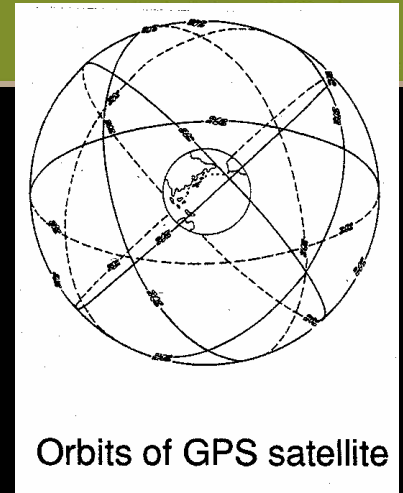
<http://www.casa.ucl.ac.uk/capableproject/>

CASA sub-projects in CAPABLE project

- GPS surveys
- Development of Multi-agent-based model of children's spatial movement
 - Behaviour model
 - Software



GPS-based technology



GPS satellite positions

$$(x_i, y_i, z_i, t_i) \quad i=1..4$$

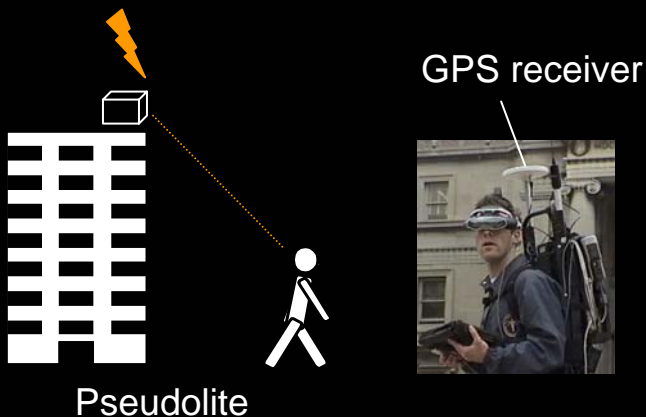
$$(X-x_i)^2 + (Y-y_i)^2 + (Z-z_i)^2 = l_i^2 = C^2 * (T-t_i)^2 \longrightarrow (X, Y, Z, T)$$

✓ Requirement

Signals from at least 4 different satellites

✓ Lots of complementary technologies

DGPS	Improve the accuracy by FM radio wave	0.3m-10m
RTK-GPS	Receive the same GPS signal at a reference points & mobile receiver	1-10cm
Pseudolite	Set transmitters which emit signal similar to that of GPS	6-30cm
SnapTrack	Mobile GPS receiver and server	10-100m
Indoor GPS	High-reception receiver	10-100m
GPS one	Combination of GPS and cellular system	10-500m

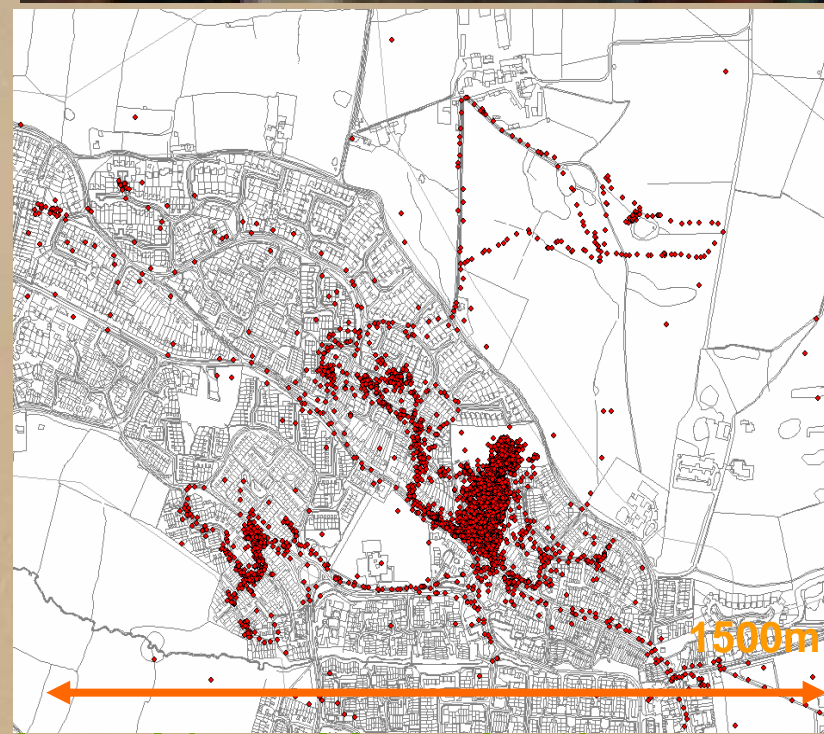
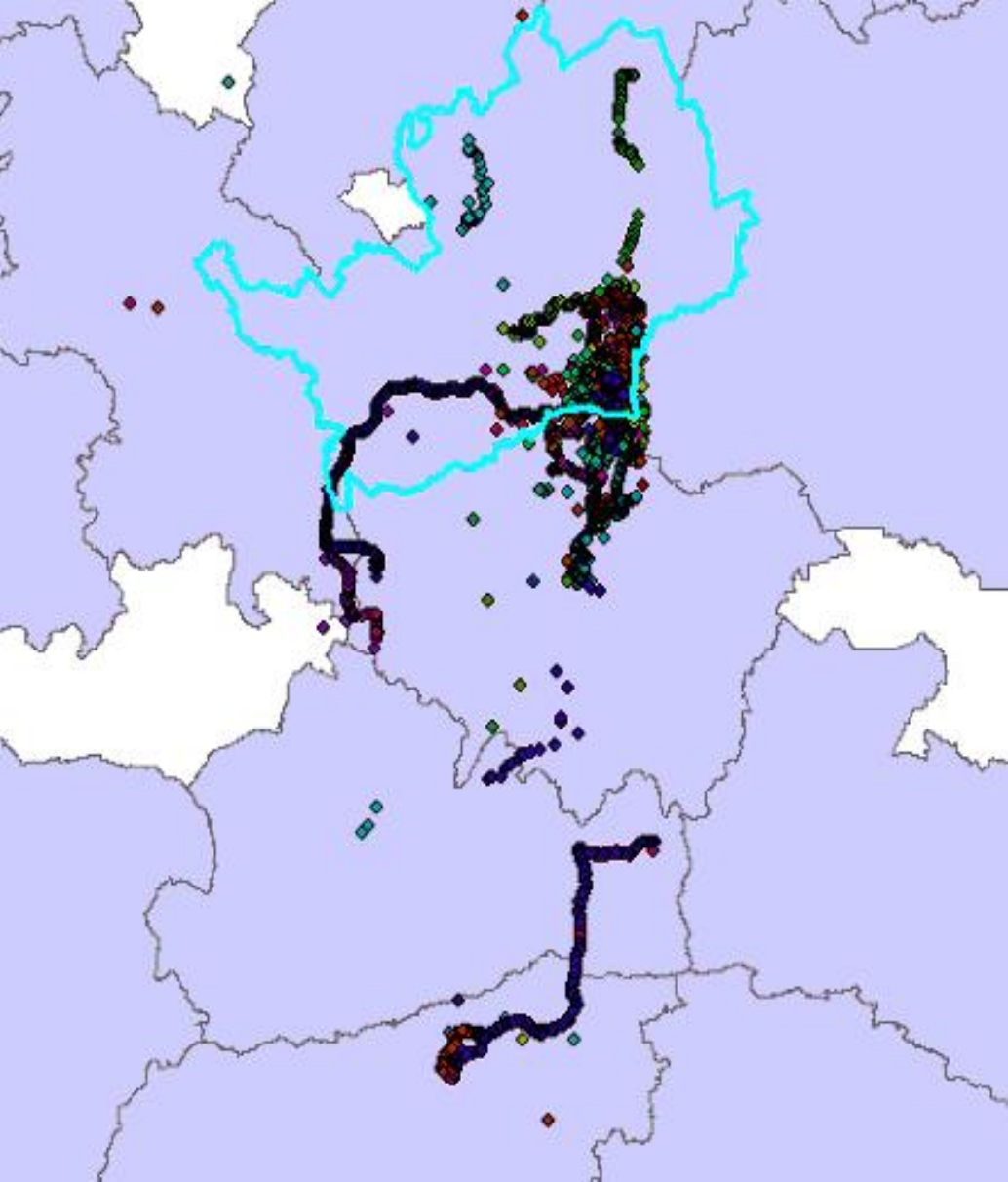


Tracking children's spatial movement

- Global Positioning System (GPS) equipments
 - Garmin GPS Foretrex 201
- GPS data sample



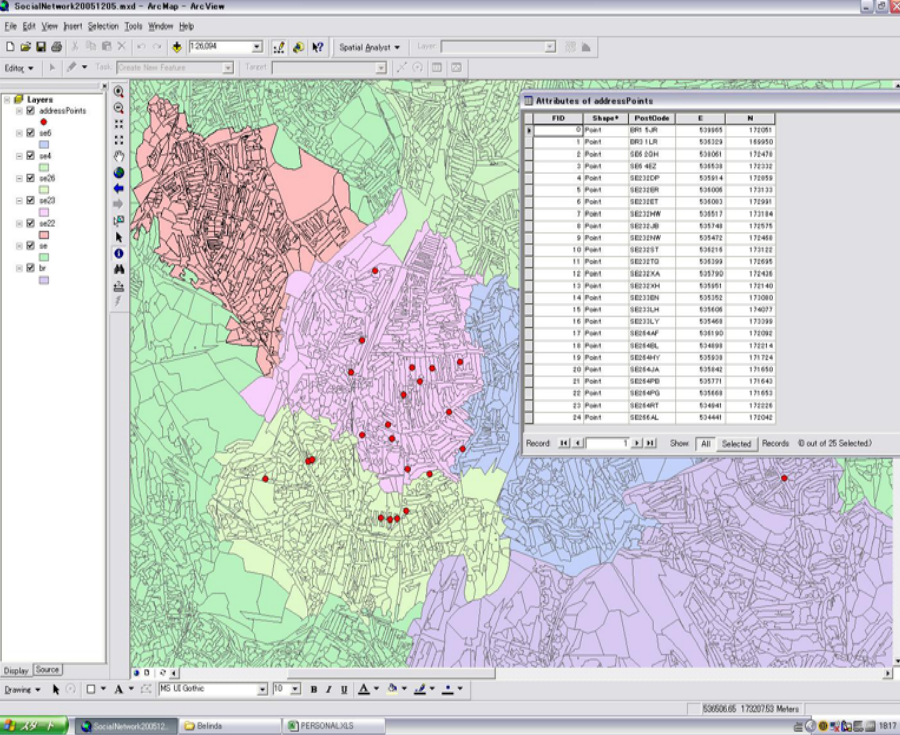
Holy Family - DB (GPS 1).csv													
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Header	Position	Time	Altitude	Depth	LegLength	LegTime	LegSpeed	LegCourse	Latitude	Longitude	E	N
2	Trackpoint	N51 48.708 W0 10.849	13/07/2005 10:47	75 ft						N51 48.70 W0 10.849		525505	214138
3	Trackpoint	N51 48.711 W0 10.848	13/07/2005 10:47	75 ft		16 ft	00:00:02	5.6 mph	17? true	N51 48.71 W0 10.848		525506	214143
4	Trackpoint	N51 48.709 W0 10.861	13/07/2005 10:47	75 ft		49 ft	00:00:04	8.4 mph	261? true	N51 48.70 W0 10.861		525491	214139
5	Trackpoint	N51 48.706 W0 10.865	13/07/2005 10:47	75 ft		28 ft	00:00:04	4.7 mph	212? true	N51 48.70 W0 10.865		525486	214134
6	Trackpoint	N51 48.706 W0 10.870	13/07/2005 10:47	75 ft		19 ft	00:00:02	6.6 mph	270? true	N51 48.70 W0 10.870		525481	214134
7	Trackpoint	N51 48.708 W0 10.861	13/07/2005 10:47	75 ft		37 ft	00:00:09	2.8 mph	65? true	N51 48.70 W0 10.861		525491	214138
8	Trackpoint	N51 48.711 W0 10.860	13/07/2005 10:47	75 ft		16 ft	00:00:05	2.2 mph	17? true	N51 48.71 W0 10.860		525492	214143
9	Trackpoint	N51 48.713 W0 10.866	13/07/2005 10:47	75 ft		29 ft	00:00:04	4.9 mph	303? true	N51 48.71 W0 10.866		525485	214147
10	Trackpoint	N51 48.716 W0 10.870	13/07/2005 10:47	75 ft		21 ft	00:00:03	4.9 mph	317? true	N51 48.71 W0 10.870		525480	214152
11	Trackpoint	N51 48.712 W0 10.875	13/07/2005 10:47	75 ft		30 ft	00:00:11	1.9 mph	219? true	N51 48.71 W0 10.875		525475	214145
12	Trackpoint	N51 48.711 W0 10.873	13/07/2005 10:48	73 ft		12 ft	00:00:14	0.6 mph	129? true	N51 48.71 W0 10.873		525477	214143
13	Trackpoint	N51 48.711 W0 10.873	13/07/2005 10:48	73 ft		0 ft	00:00:01	0.0 mph	0? true	N51 48.71 W0 10.873		525477	214143



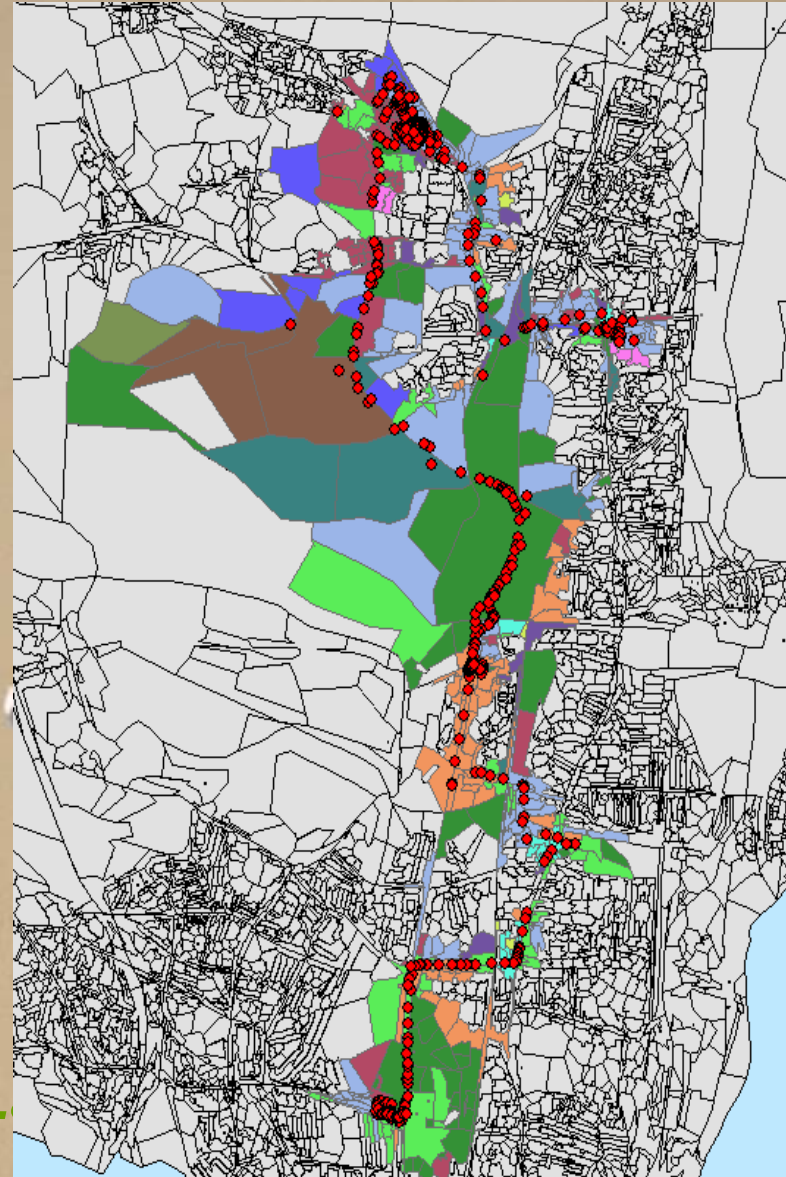
GPS traces of 30 children (4 days)

CAPABLE

<http://www.casa.ucl.ac.uk/capableproject/>



Socio-cultural characteristics of the neighbourhood



Where children's relatives/friends live

Repat

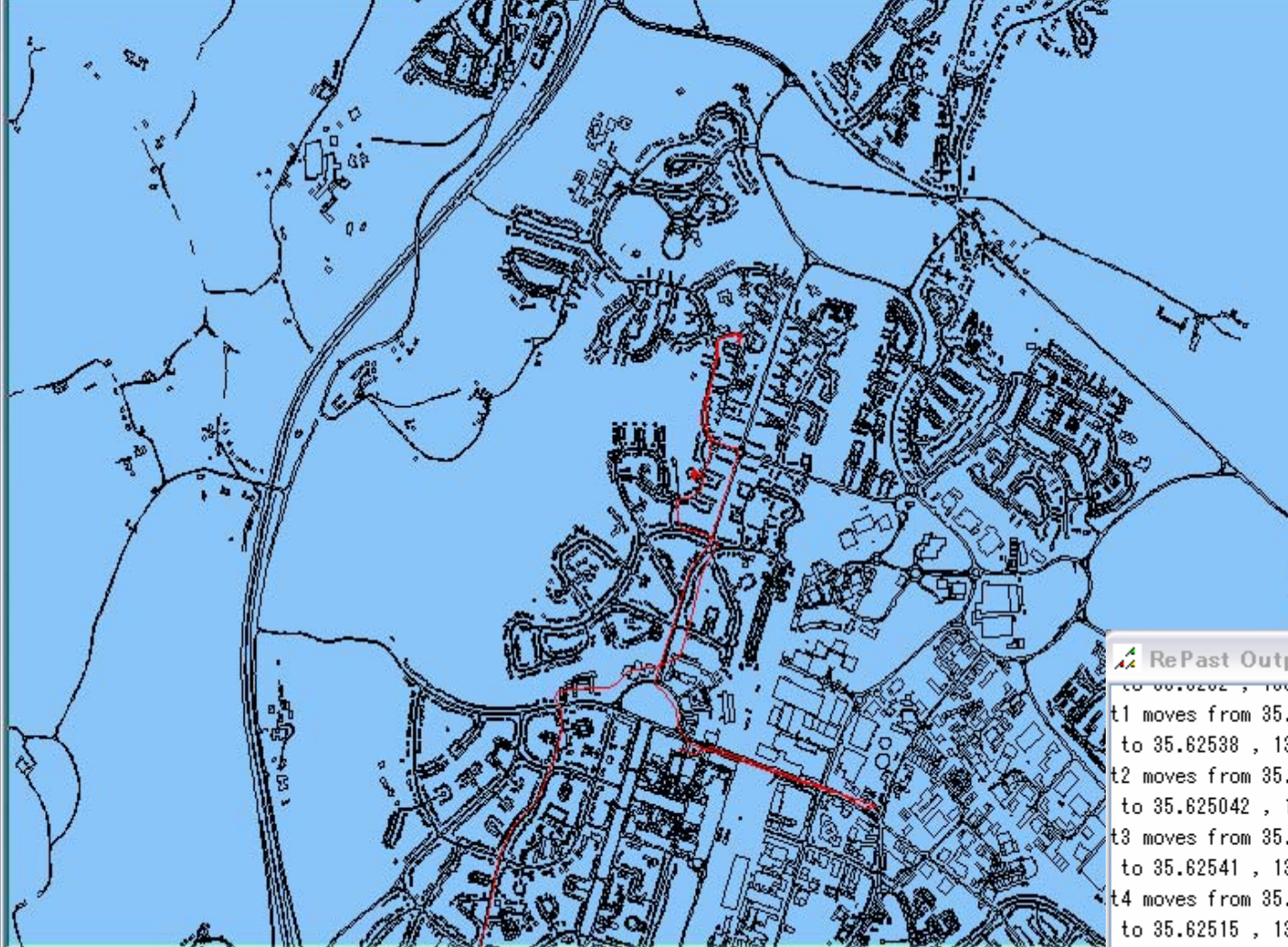

Tick Count: 11.0 Run: 1



CAPABLE GPS Survey

Control Navigate Views Layers

Mouse Mode: Navigation 1:31,744



Lat, Lon (51.814, -0.241) - x, y (1,209)

GPS TestApp Setti...

Parameters Custom Actions Repast Actions

Make Movie

Take Snapshot

Create / Edit Charts

- In Alpha Order
- Stdout to Console
- Stderr to Console
- Rng Seed in Defaults
- Update Probes
- Show Custom Charts

Set As Default

Write Parameters

About

RePat Output

```
CO 00.0202 , 100.10000
t1 moves from 35.625427 , 139.78043
to 35.62538 , 139.78041
t2 moves from 35.625046 , 139.78087
to 35.625042 , 139.78078
t3 moves from 35.62538 , 139.78067
to 35.62541 , 139.78064
t4 moves from 35.6252 , 139.78055
to 35.62515 , 139.78049
```

Thank you!

Kay Kitazawa

k.kitazawa@ucl.ac.uk

<http://www.casa.ucl.ac.uk/kay>



CAPABLE

<http://www.casa.ucl.ac.uk/capableproject/>