MEASURING MICROSCOPIC FLOW PERFORMANCE FOR PEDESTRIANS

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ABSTRACT

INTRODUCTION

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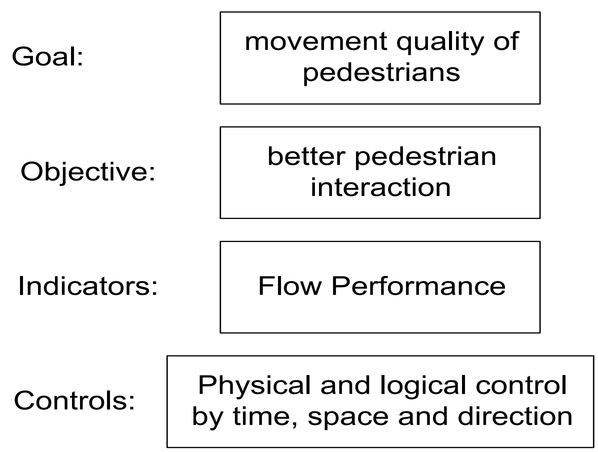
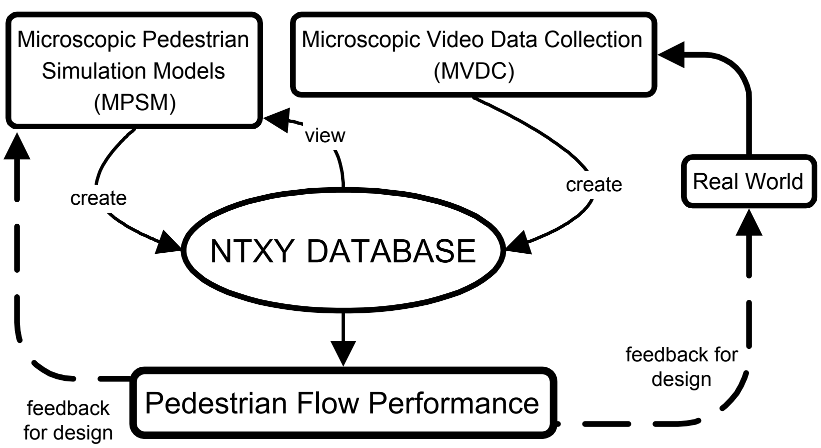

Goal:
movement quality of pedestrians
Objective:
better pedestrian interaction
Indicators:
Flow Performance
Controls:
Physical and logical control by time, space and direction

NTXY DATABASE



NTXY

	N	T	X	Y
48	4	10	477	797
49	4	11	489	875
50	4	12	495	959
51	5	3	33	217
52	5	4	109	305
53	5	5	185	390
54	5	6	267	515
55	5	7	310	610
56	5	8	322	702
57	5	9	331	807
58	5	10	328	895
59	5	11	328	969
60	6	3	875	919
61	6	4	842	786
62	6	5	821	692

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FLOW PERFORMANCE

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ρ

$\rho -$ = −

$$\vec{\delta} = \vec{} _{+} - \vec{}$$

$$\vec{\Omega} = \vec{} - \vec{}$$

Table 1. Individual Pedestrian Flow Performance

	$\omega = \sum_{=}^{-} \left\| \vec{}_{+} - \vec{} \right\|$
	$\upsilon = \frac{\omega}{-}$
	$\Psi = \frac{\left\|\vec{\Omega}\right\|}{\omega}$
	$\gamma = \frac{\sum_{=}^{-} \left\| \vec{\delta} - \frac{\vec{\Omega}}{\rho -} \right\|}{\omega \ \rho -}$
	$\lambda = \frac{\omega - \left\|\vec{\Omega}\right\|}{\omega \upsilon}$

$$\vec{} = \frac{\vec{\Omega}}{\left\|\vec{\Omega}\right\|}$$

κ

Table 2. Macroscopic Traffic Flow Variables

	$= \frac{\kappa}{-}$
	$= \frac{\sum \upsilon}{\kappa}$
	$= \frac{}{\frac{}{\kappa} \sum \frac{}{\upsilon}} = \frac{\kappa}{\sum \frac{}{\upsilon}}$
	$= \frac{\kappa}{}$

AUTOMATION OF MICROSCOPIC DATA COLLECTION

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et al

et al

et al

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X_i Y_i X Y

$=$ $+$ $+$

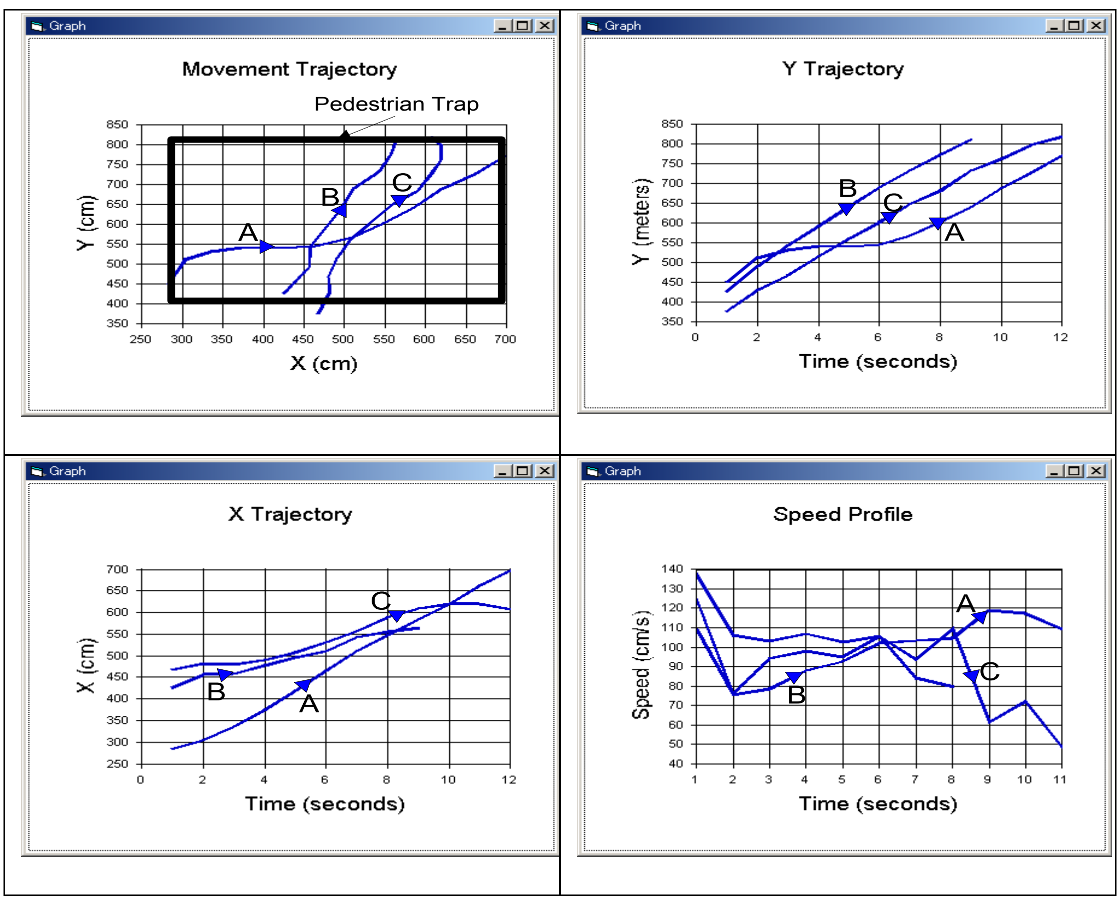
$=$ $+$ $+$

$=$ $+$ $-$ $=$

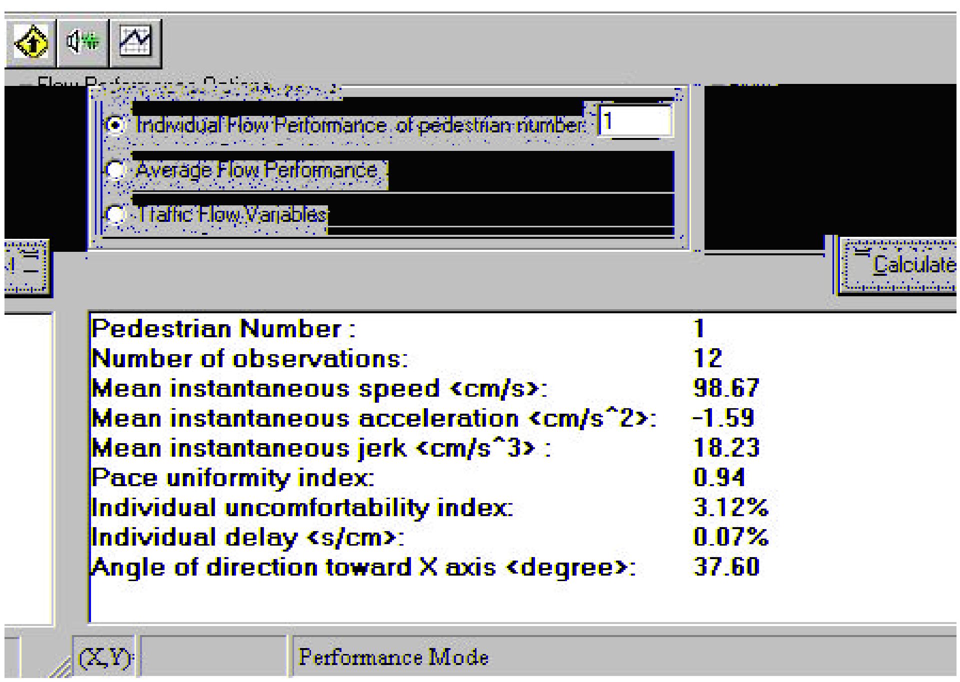
$-$

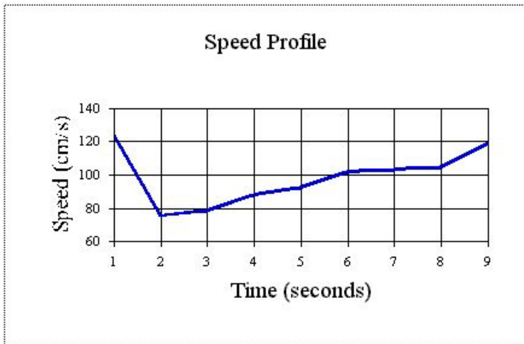
$=$ $+$ $+$ $=$

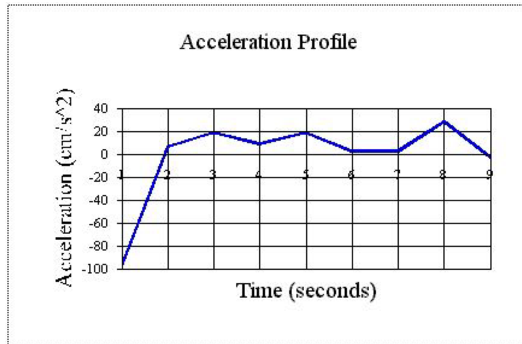
RESULTS AND DISCUSSIONS

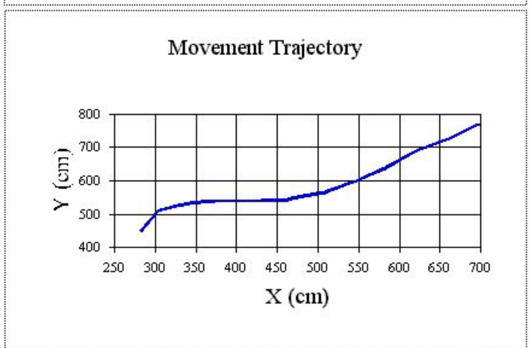


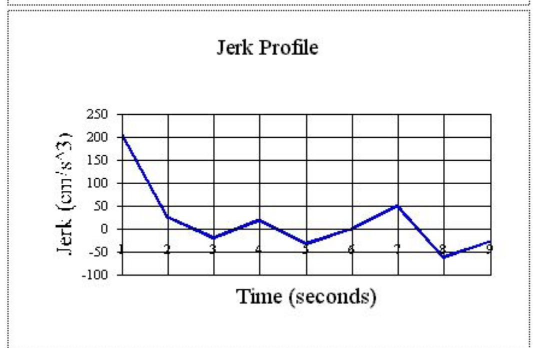
Graph
Movement Trajectory
Pedestrian Trap
Y (cm)
X (cm)
A
B
C
Graph
Y Trajectory
Y (meters)
Time (seconds)
A
B
C
Graph
X Trajectory
X (cm)
Time (seconds)
A
B
C
Graph
Speed Profile
Speed (cm/s)
Time (seconds)
A
B
C

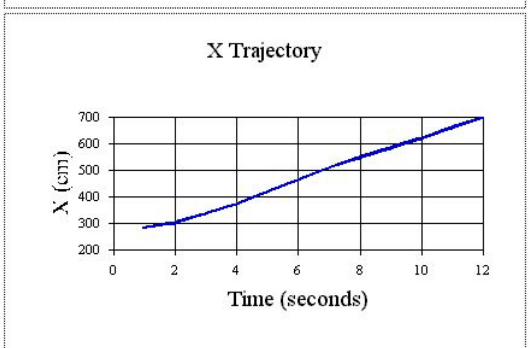

Individual Flow Performance of pedestrian number: 1
Average Flow Performance
Traffic Flow Variables
Calculate
Pedestrian Number : 1
Number of observations: 12
Mean instantaneous speed <cm/s>: 98.67
Mean instantaneous acceleration <cm/s^2>: -1.59
Mean instantaneous jerk <cm/s^3> : 18.23
Pace uniformity index: 0.94
Individual uncomfortability index: 3.12%
Individual delay <s/cm>: 0.07%
Angle of direction toward X axis <degree>: 37.60
(X,Y)
Performance Mode

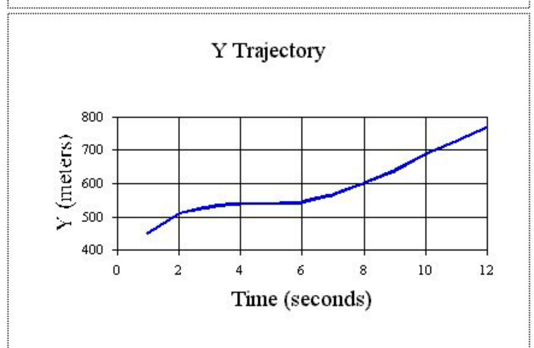

Speed Profile
Speed (cm/s)
Time (seconds)

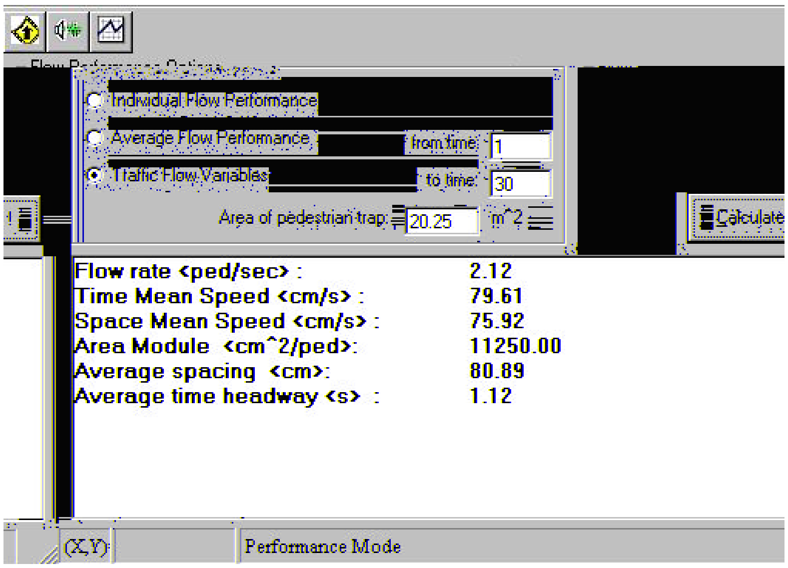

Acceleration Profile
Acceleration (cm/s^2)
Time (seconds)


Movement Trajectory
Y (cm)
X (cm)


Jerk Profile
Jerk (cm/s^3)
Time (seconds)


X Trajectory
X (cm)
Time (seconds)


Y Trajectory
Y (meters)
Time (seconds)



CONCLUSIONS

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