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APPENDIX A: LIST OF ABBREVIATIONS AND NOTATIONS

Abbreviations:

AGFLC: Ant-Genetic based Fuzzy Logic controller
AS: Ant System
AVL: Automatic Vehicle Location
BRT: Bus Rapid Transit
DB: Data Base
FLC: Fuzzy Logic Controller
FTA: Federal Transit Administration
GFLC: Genetic Fuzzy Logic Controller
GPS: Global Positioning System
LRT: Light Rail Transit
RB: Rule Base
TPS: Transit Preemption Signal
TSP: Traveling Salesman Problem

Notations:

$x_1,\ldots,x_N$: state variables
y: control variable
$A_{i1},\ldots,A_{iN}$: linguistic variables for $x_1,\ldots,x_N$
B_i: linguistic variable for y
$U_1,\ldots,U_N$: universe of discourse of $x_1,\ldots,x_N$
V: universe of discourse of y
N: number of state variables
M: number of rules
i, j, r, s: city i, j, r, s
K: number of ants
S: city S, selected according to probability P_{rs}^k
P_{rs}^k: the probability with which ant k choose to move from city r to city s
q_0: parameter of transition rule
q: random number chosen randomly with uniform probability in [0,1]
τ^0: initial pheromone

ξ : pheromone decay parameter for local update rule

ρ : pheromone decay parameter for global update rule

t_{max}: maximal iteration of ACO

k: ant k

η_{rj} : heuristic value on arc(r,j)

τ_{rj} : amount of pheromone trail on arc(r,j)

J_r^k : set of cities that remain to be visited by ant k positioned on city r

α, β : parameters representing the relative importance of heuristic value and pheromone trail

$L_k(t)$: length of tour constructed by ant k

$L^+(t)$: the shortest path of iteration t

$L^*(t)$: tour length of $T^*(t)$

$T^*(t)$: best-so-far tour till the t^{th} iteration

t: iteration t

GR: remaining green time when a transit actuates the detector

H: the time needed for a transit vehicle traveling from the detector through the far-side stop line of the intersection

L: the time needed for a transit vehicle traveling from the detector to the near-side stop line of the intersection

G_{ext} represents the green extension time

RR: the remaining red time when a transit actuates the detector

AR: the all-red time

R_{tru}: the red truncation time

NE: the degree of necessity to implement TPS

N_t: the threshold value preset to determine whether the priority is provided or not

TF: traffic flows at all approaches in the green phase

QL: queue length at all approaches in the red phase

NL: negative large

NS: negative small

ZE: zero

PS: positive small

PL: positive large

c_k^r: the coordinate of right anchor of k^{th} linguistic degree

c_k^c: the coordinate of cortex of k^{th} linguistic degree

c_k^l: the coordinate of left anchor of k^{th} linguistic degree

$c_{\max}$: the maximum value of the variable

$c_{\min}$: the minimum values of the variable

r_i: position variable

a: parameter of crossover

h: parameter of mutation

v: number of evolution epoch

p: number of chromosome of a generation

d_i: number of linguistic degree of x_i

δ : mature rate of GA

f_v: best objective value of the v^{th} evolution

ε : arbitrary small number

AR_i: the i^{th} antecedent

C_j: consequent j, j=1~J

J: number of linguistic degree of the control variable

C_{J+1}: the exclusion set

θ_{ij} : the reasonability value on arc(i,j)

E: objective function

E_p: value of objective function simulated by a predetermined rule table with equally distributed membership function

TPD: the total person delays

APPENDIX B: VITA

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A. 與論文相關論文 (Refereed Papers)

1. Chiou, Yu-Chiun, Ming-Te Wang and Lawrence W. Lan (2005), "Coordinated Transit-preemption Signal Controllers along an Arterial: Iterative Genetic Fuzzy Logic Controller (GFLC) Method," *Journal of the Eastern Asia Society for Transportation Studies*, Vol. 6, pp. 2321-2336.
2. Chiou, Yu-Chiun, Ming-Te Wang and Lawrence W. Lan (2003), "Adaptive Bus-preemption Signals with Genetic Fuzzy Logic Controller (GFLC)," *Journal of the Eastern Asia Society for Transportation Studies*, Vol. 5, pp. 1745-1759.

B. 其他投稿論文 (Other refereed papers)

1. Chiou, Yu-Chiun, Ming-Te Wang and Lawrence W. Lan (2006), "Ant-Genetic Based Fuzzy Logic Controller Algorithms," Manuscript submitted to *Fuzzy Sets and Systems*.
2. Lan, Lawrence W., Ming-Te Wang and April Y. Kuo (2006), "Development and Deployment of Public Transport Policy and Planning in Taiwan," *Transportation*, Vol. 33, No. 2. (SSCI)
3. 藍武王、王銘德（2002），「臺灣公路客運現況及未來展望」，*工程*，75 卷 2 期，頁 86~102。

C. 研討會論文 (Conference Papers)

1. Chiou, Yu-Chiun, Ming-Te Wang and Lawrence W. Lan, "Adaptive Transit Preemption Signal Fuzzy Logic Controllers with Ant Colony Optimization and Genetic Algorithm," Manuscript prepared to submit to 17th International Symposium on Transportation and Traffic Theory (ISTTT) in London, 23-25 July, 2007. (Abstract accepted)

2. Chiou, Yu-Chiun, Ming-Te Wang and Lawrence W. Lan, "Adaptive Traffic Signal Control with Transit Preemption: Genetic Fuzzy Logic Controller Approach," Manuscript prepared to submit to the 11th International Conference Of Hong Kong Society For Transportation Studies (HKSTS) in Hong Kong, 9-11 December, 2006. (Abstract accepted)

3. Chiou, Yu-Chiun, Ming-Te Wang and Lawrence W. Lan (2006), "Genetic Fuzzy Logic Transit Preemption Signal Controller with Consideration of Loading Information," Presented in INFORMS International Conference, Hong Kong.

D. 研究報告及其他 (Research Reports and Other Papers)

1. 藍武王、王銘德、陳其華、郭怡雯（2003），*公路汽車客運業經營困境之因應對策*，研究報告，臺灣省公共汽車客運商業同業公會聯合會委託研究。