

(a)



(b)

overview

- Modelling the behaviour of the system using State Charts
- Using Simulink – Stateflow to model & implement a system in terms of Hierarchical state machines

Design of Traffic Light Control Systems Using State charts/HSM

Notation for variables

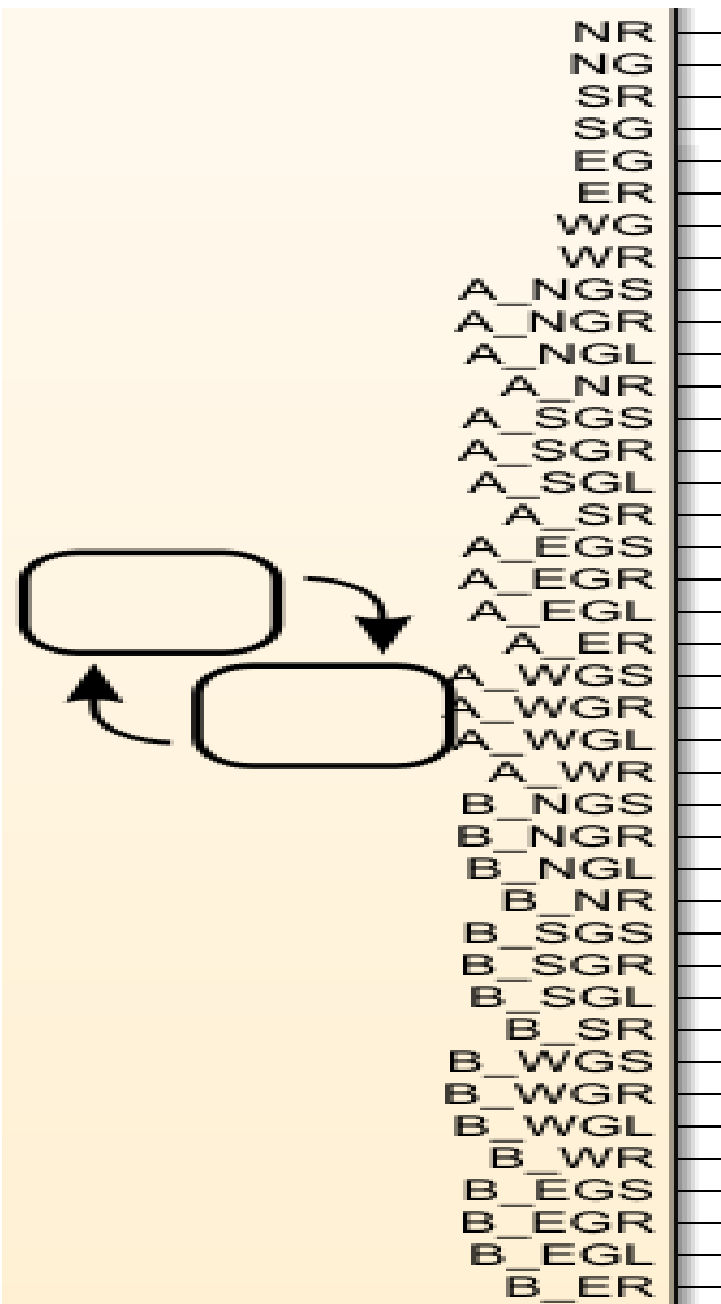
“Controller_” “bound direction” “light” “move allow”

Controllers-A,B,C

Bound directions-North,South,West,East

Light-Green(with directions),Yellow, Red

Move allow-Left(L),right(R),straight(S)

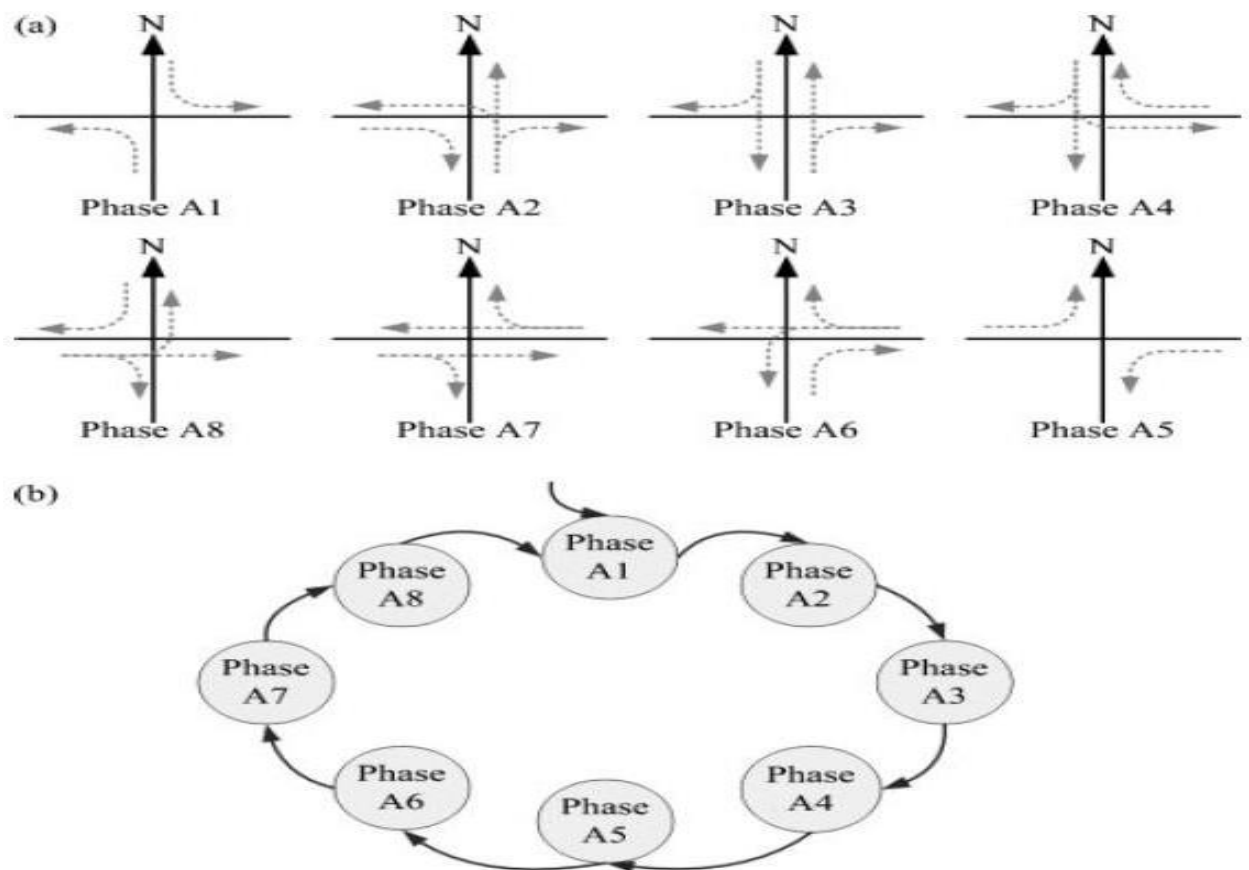


controller combination

For A

Traffic light indication by analysing bounds

(as shown via graphs, state machines)



Controller A

Variables used

- **A_NGS-CONTROLLER-A NORTH BOUND GREEN SRAIGHT**

(A_ "S/E/W...BOUND" "G/Y...LIGHT" "S/L/R..DIRCTIONS")

- FOR RED LIGHT

A_NR-CONTROLLER-A NORTH BOUND RED

(A_ "S/W/E"R)

45 sec transitions between states **A1-A2.....A8**



For B

Variables used

- **B_NGS-CONTROLLER-B NORTH BOUND GREEN SRAIGHT**

(B_ "S/E/W...BOUND" "G/Y...LIGHT" "S/L/R..DIRCTIONS")

- FOR RED LIGHT

B_NR-CONTROLLER-B NORTH BOUND RED

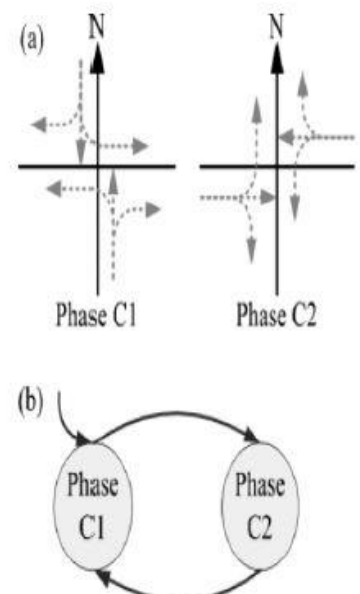
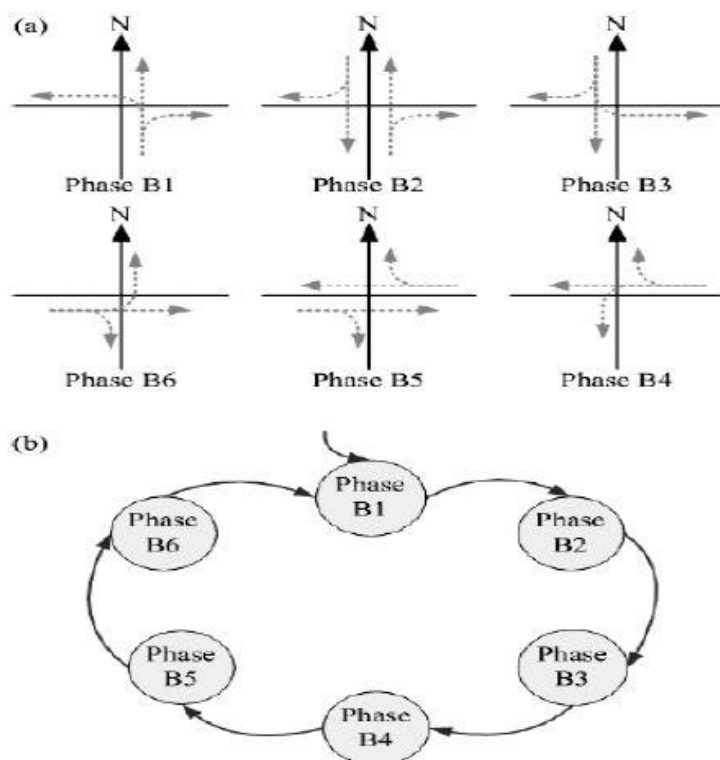
(B_ "S/W/E"R)

45 sec transitions between states **B1-B2,B4-B5**

90 sec transitions between states **for rest states**

Traffic light indication by analysing bounds

(as shown via graphs, state machines)



controller-B/C



controller-B/HSM

For C

Traffic light indication by analysing bounds

(as shown via graphs, state machines)

“BOUND DIRECTION” “LIGHT”

BOUND -N S E W,

LIGHT-G Y R

NG-NORTH BOUND GREEN

NR,SG,SR,EG,ER,WG,WR

90 sec transitions between states

Outer to inner decomposition

- A,B,C controllers

Parallel (AND)

- Inside controllers' states

Exclusive(OR)

A1-A8

B1-B6

C1-C2

- Substates

Parallel (AND)

A1-A8-North/south/east/west bound states (parallel)

B1-B6-North/south/east/west bound states (parallel)

C1-C2-North/south/east/west bound states (parallel)

controller-C/HSM

