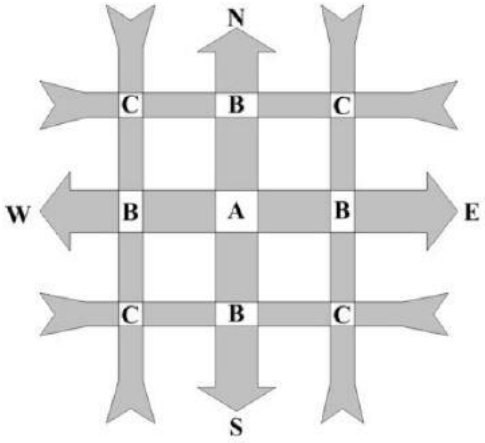
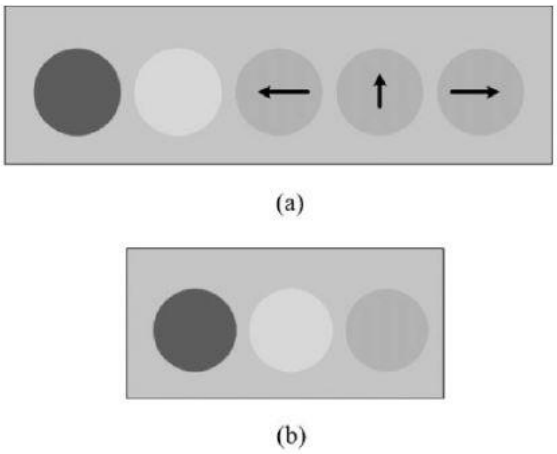
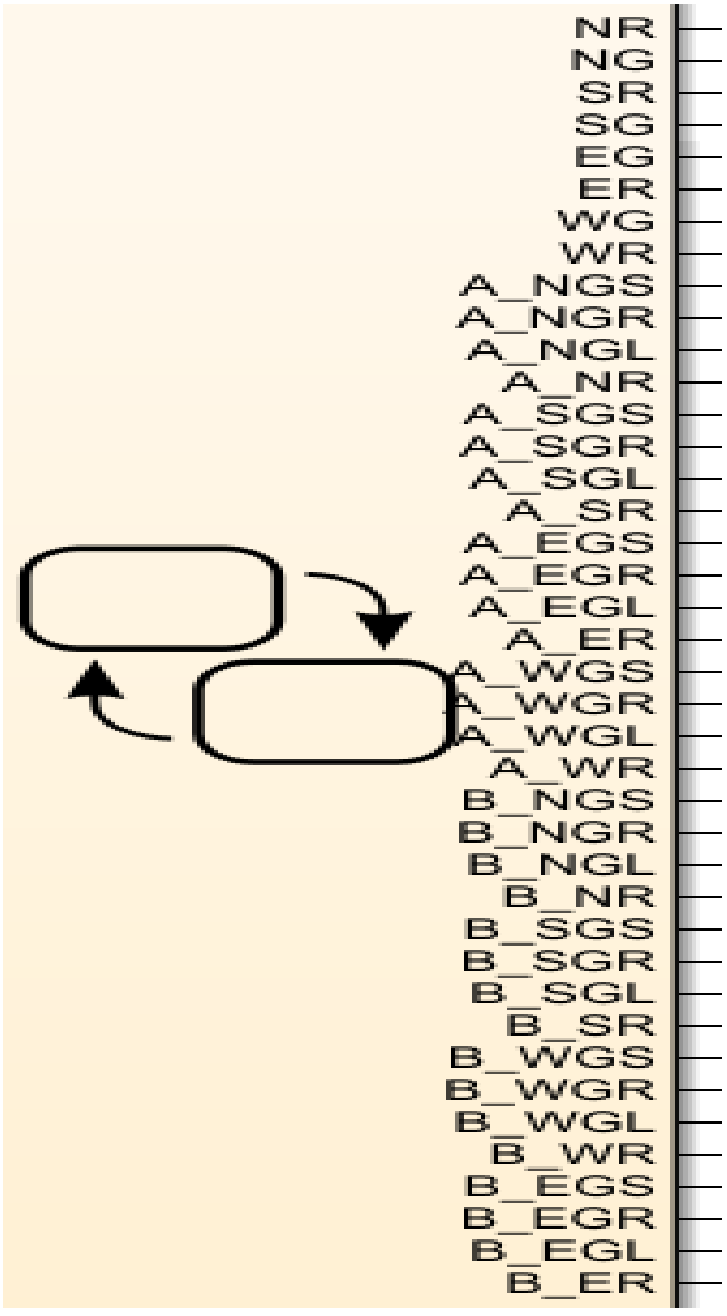


overview



- 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



controller combination

Notation for variables

"Controller_" "bound direction" "light" "move allow"

Controllers-A,B,C

Bound directions-North,South,West,East

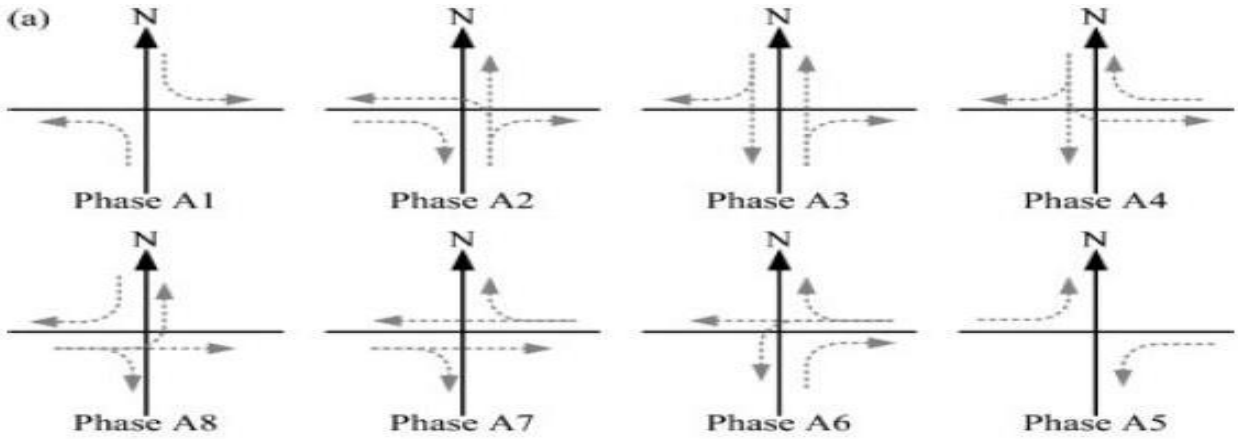
Light-Green(with directions),Yellow, Red

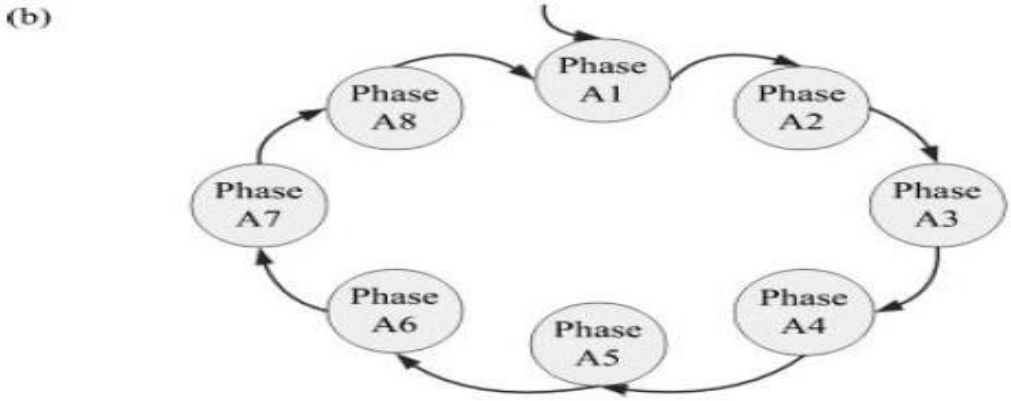
Move allow-Left(L),right(R),straight(S)

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")

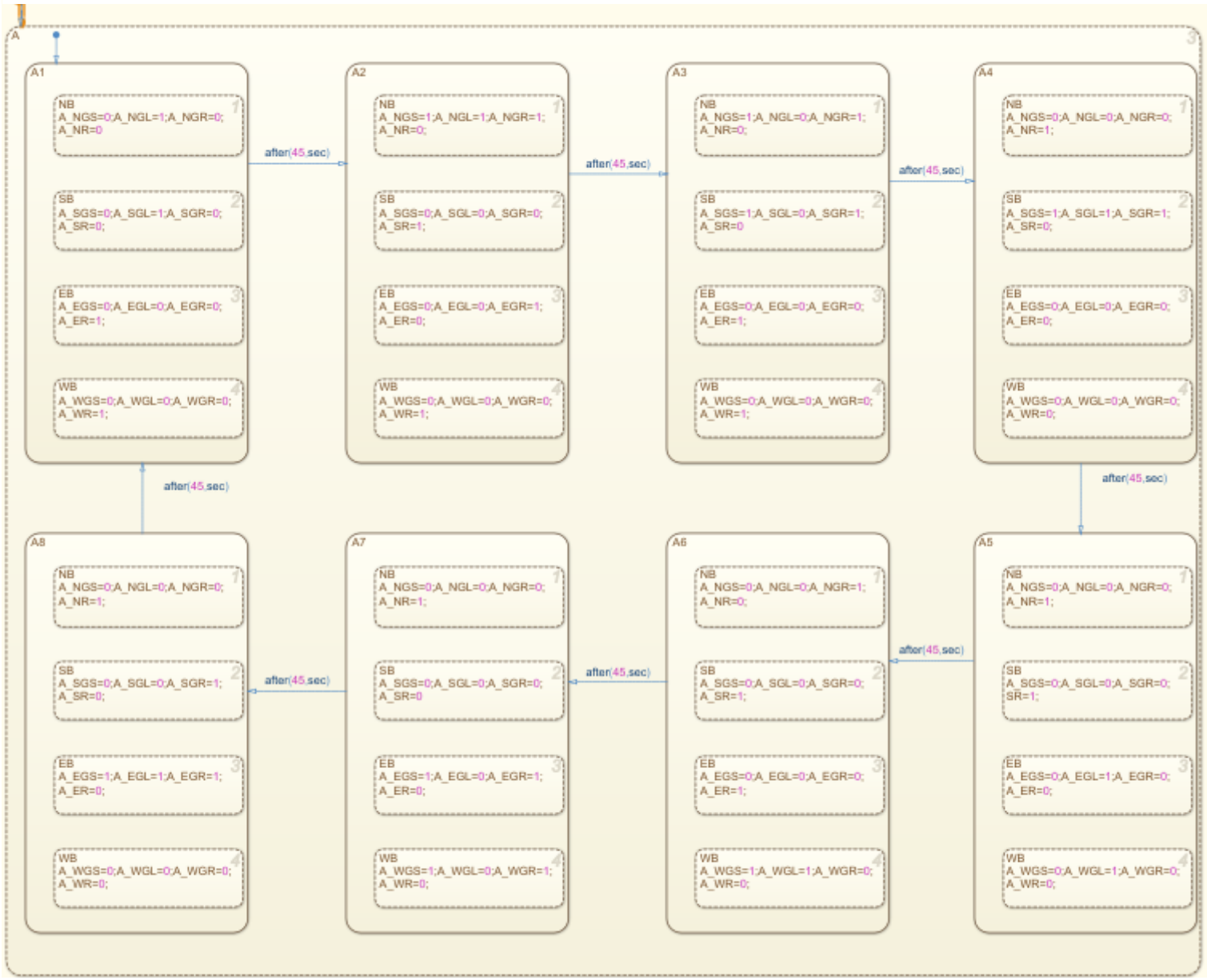
- FOR RED LIGHT

A_NR-CONTROLLER-A NORTH BOUND RED

(A_"S/W/E"R)

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

controller-A/HSM



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

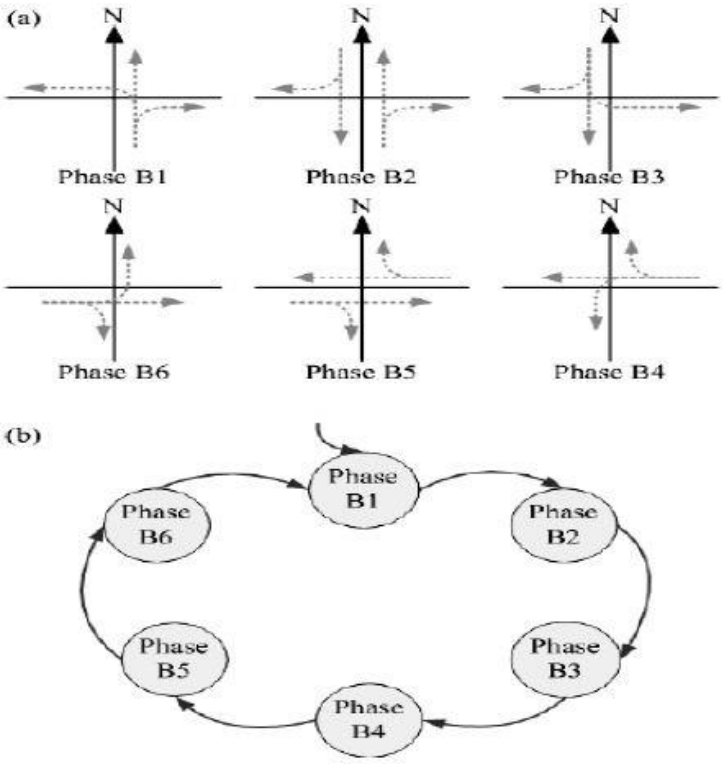
(B_"S/W/E"R)

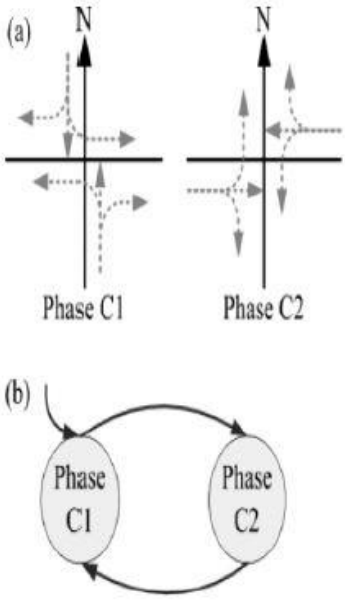
45 sec transitions between states **B1-B2,B4-B5**

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”

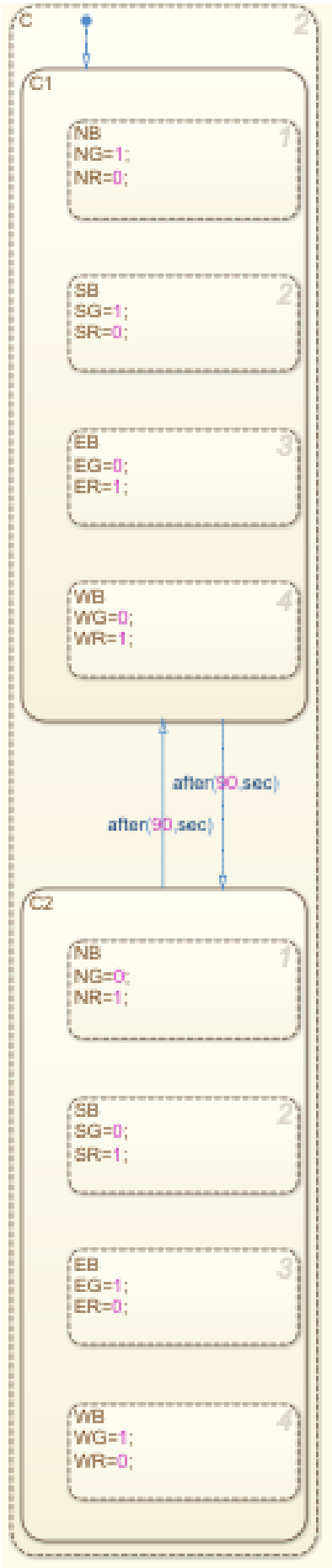
BOUND -N S E W,

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** controller-C/HSM

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)