COMP90054 Software Agents Foundations—States, Intensionality, Partial Observability & Epistemic Logic

Adrian Pearce

Outline

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Modal logic

See Section 2.1 of van der Hoek, W., Logical Foundations of Agent-Based Computing, LNAI 2086, pp. 50-73 (2001)

Epistemic logic

See Section 2.2 of van der Hoek, W., Logical Foundations of Agent-Based Computing, LNAI 2086, pp. 50-73 (2001)

Example: Alternating Bit Protocol

Protocol for S:

i:=0

while true do

begin read x_i;

send x_i

i := i+1

end

Protocol for R:

when $K_R(x_0)$ set i:=0

while true do

begin read x_i; write x_i;

i:= i+1

end

Example: Alternating Bit Protocol

Protocol for S:

i:=0

while true do

begin read x_i;

send x_i until $K_S K_R(x_i)$;

i := i+1

end

Protocol for R:

when $K_R(x_0)$ set i:=0

while true do

begin read x_i; write x_i;

send "$K_R(x_i)$"

i:= i+1

end

Example: Alternating Bit Protocol

Protocol for S:

i:=0

while true do

begin read x_i;

send x_i until $K_S K_R(x_i)$;

send "$K_S K_R(x_i)$" until $K_S K_R K_S K_R(x_i)$

i := i+1

end

Protocol for R:

when $K_R(x_0)$ set i:=0

while true do

begin read x_i; write x_i;

send "$K_R(x_i)$" until $K_R K_S K_R(x_i)$;

send "$K_R K_S K_R(x_i)$" until $K_R(x_{x+1})$

i:= i+1

end

Publications

- van der Hoek, W., Logical Foundations of Agent-Based Computing, LNAI 2086, pp. 50-73 (2001)

Summary