UoC Lab.

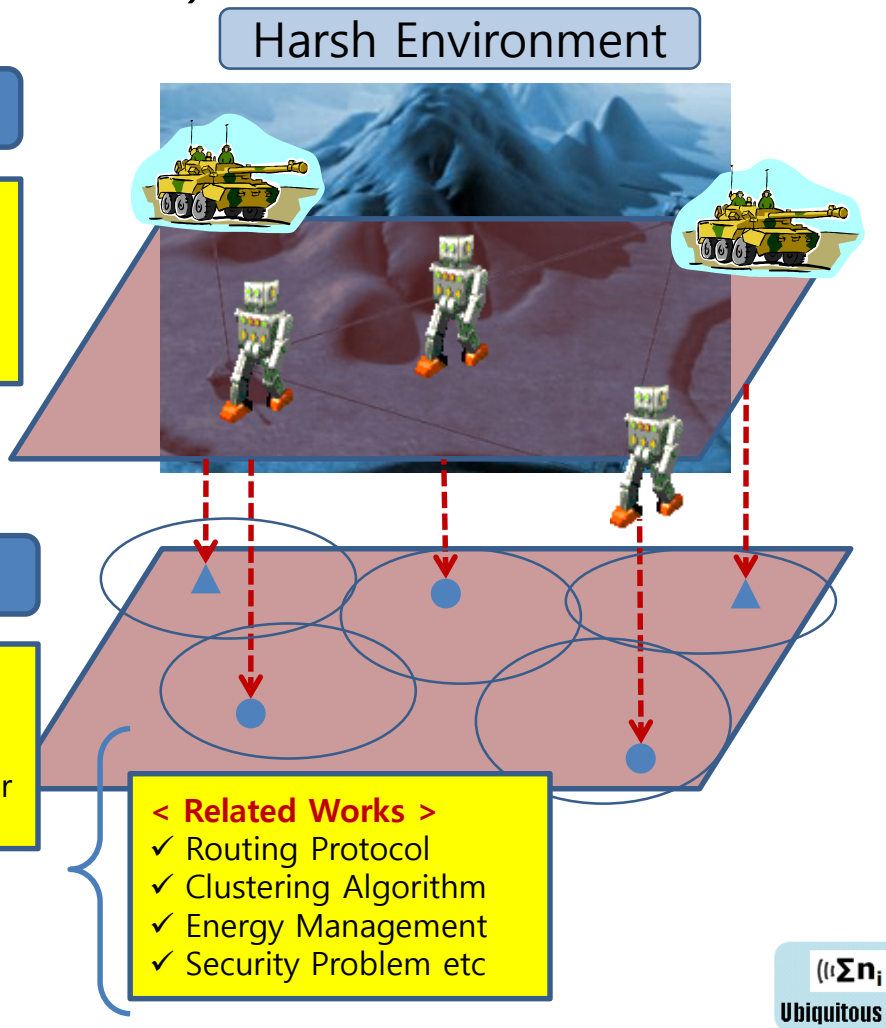
(Ubiquitous System on Context/Chip Network)

KOREATECH
KOREA UNIVERSITY OF TECHNOLOGY & EDUCATION

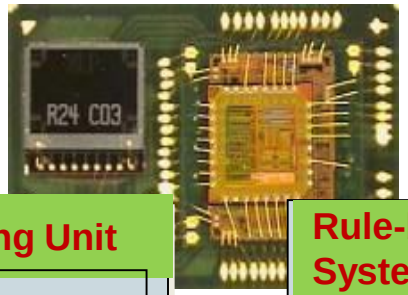
UoC Lab.
Ubiquitous on Chip Laboratory

연구분야

◆ Mobile Ad hoc Networks(MANETs)



Context-aware System Architecture



Transceiver Unit

Multi Sensor Module Unit

Communication Unit

Pre-process unit

Input queue

상황정보 수집함

Output queue

경고 등 상황을 출력함

High Performance Processing Unit

- Context acquisition module
- Context acquisition module
- Query acquisition module
- Query acquisition module
- Action module
- Action module
- Task processing module
- Task processing module

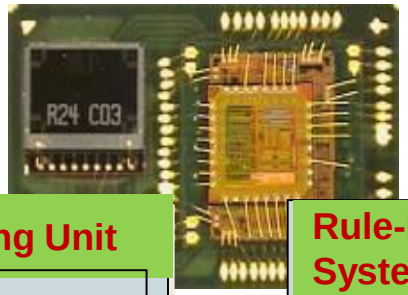
Rule-based System Unit

High-level Context Processing

Context –aware Service Coordination

(Reference Data value 가지고 있음) Blackboard (DB를 가지고 있음) Working memory

Context-aware System Architecture



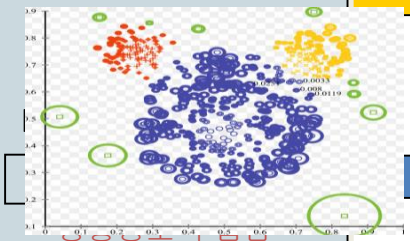
Transceiver Unit

Multi Sensor Module Unit

Pre-process Unit

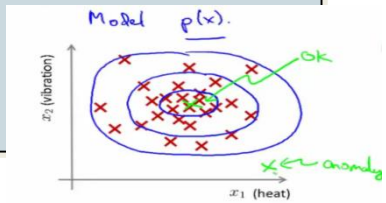
- Data Normalize

Communication Unit



Output queue

경고 등 상황을 출력함



High Performance Processing Unit

- Context acquisition module
- Context acquisition module
- Query acquisition module
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- Action module
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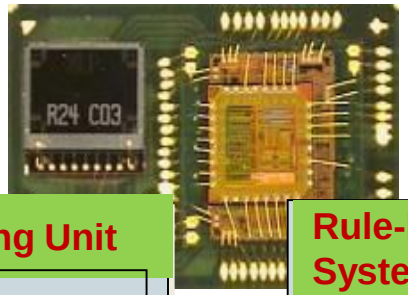

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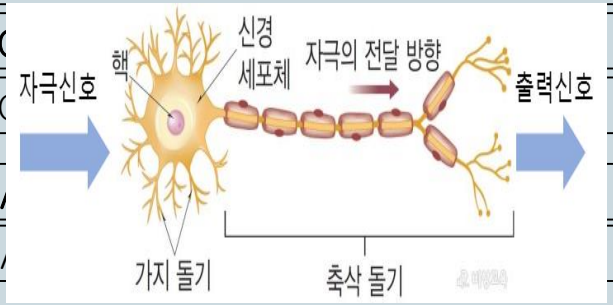
Context acquisition module

Context acquisition module



Task processing module

Task processing module

Rule-based System Unit

High-level Context Processing

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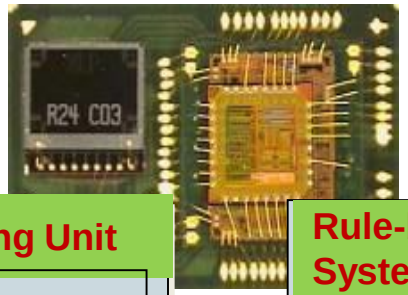
Context-aware System Architecture



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Multi Sensor Module Unit

Communication Unit

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Input queue

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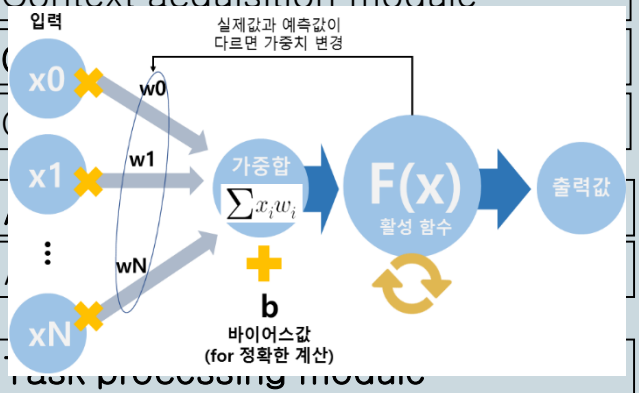
High Performance Processing Unit

Context acquisition module

Context acquisition module



Task processing module

Rule-based System Unit

High-level Context Processing

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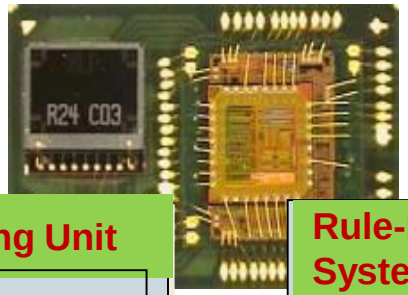

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Communication Unit

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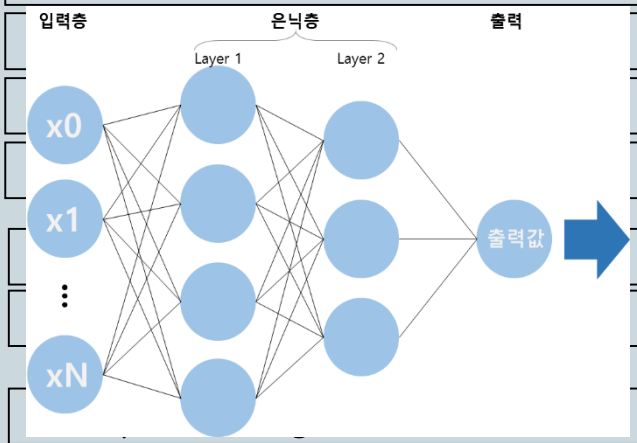
High Performance Processing Unit

Context acquisition module



Task processing module

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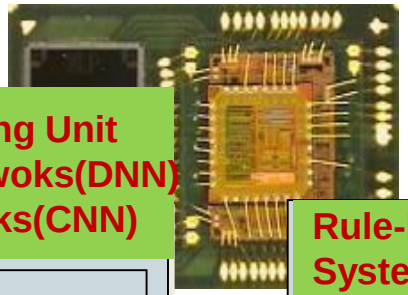

Transceiver Unit

Multi Sensor Module Unit

Communication Unit

Pre-process unit

Input queue

상황정보 수집함

Output queue

경고 등 상황을 출력함

High Performance Processing Unit
- Deep Learning Neural Netwoks(DNN)
- Convolution Neural Netwoks(CNN)

Context acquisition module

Context acquisition module

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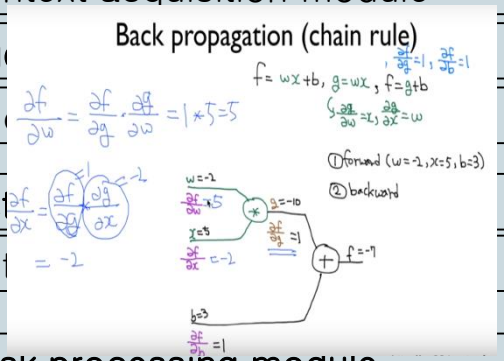


Task processing module

Task processing module

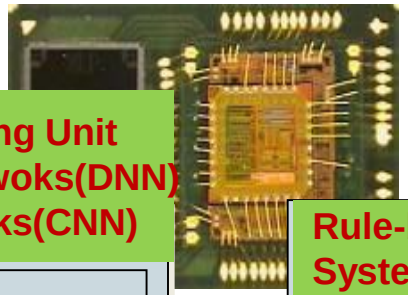
Rule-based System Unit

- High-level Context Processing
- Context –aware Service Coordination
- Context –aware State Machine
- Context –aware Sequential Machine

(Reference Data value 가지고 있음) Blackboard

(DB를 가지고 있음) Working memory

Context-aware System Architecture



Transceiver Unit

Multi Sensor Module Unit

Communication Unit

Pre-process unit

Input queue

상황정보 수집함

Output queue

경고 등 상황을 출력함

High Performance Processing Unit
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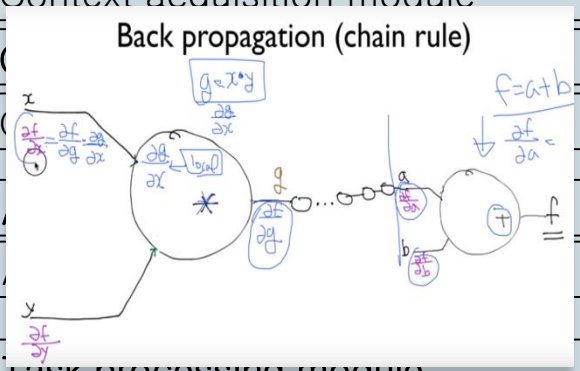
Context acquisition module

Context acquisition module



Task processing module

Task processing module

Rule-based System Unit

- High-level Context Processing
- Context –aware Service Coordination
- Context –aware State Machine
- Context –aware Sequential Machine

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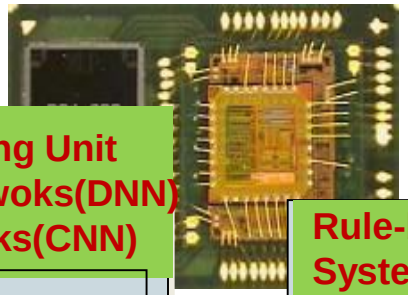
Context-aware System Architecture



Transceiver Unit

Multi Sensor Module Unit

Communication Unit

Pre-process unit

Input queue

상황정보 수집함

Output queue

경고 등 상황을 출력함

High Performance Processing Unit
- Deep Learning Neural Netwoks(DNN)
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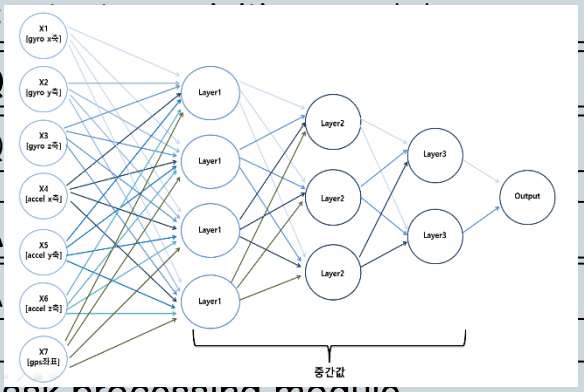
Context acquisition module



Task processing module

Task processing module

Rule-based System Unit

- High-level Context Processing
- Context –aware Service Coordination
- Context –aware State Machine
- Context –aware Sequential Machine

(Reference Data value 가지고 있음) Blackboard

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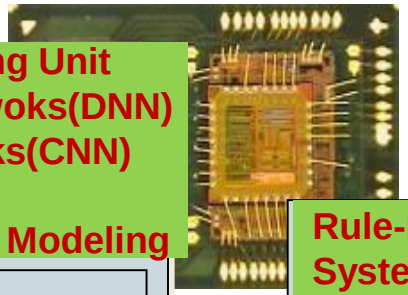
Context-aware System Architecture

Transceiver Unit



Multi Sensor Module Unit

Communication Unit

Pre-process unit

Input queue

상황정보 수집함

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경고 등 상황을 출력함

High Performance Processing Unit
- Deep Learning Neural Netwoks(DNN)
- Convolution Neural Netwoks(CNN)

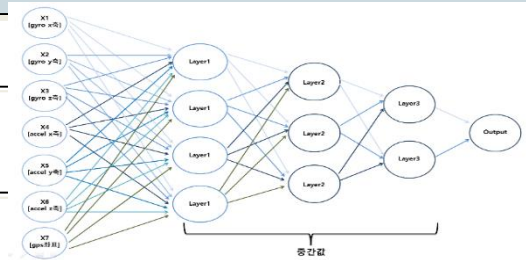
Markov Prediction

Stochastic Probability Layer Modeling

- Context acquisition mo dule
- Context acquisition module
- Query acquisition module
- Query acquisition module
- Action module
- Action module
- Task processing module
- Task processing module

Rule-based System Unit

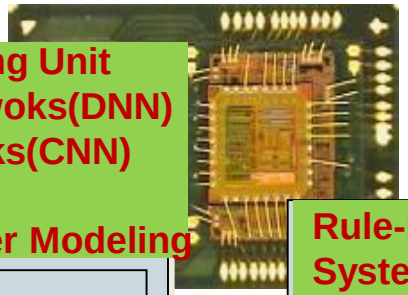
- High-level Context Processing
- Context –aware Service Coordination
- Context –aware State Machine
- Context –aware Sequential Machine



Blackboard (DB를 가지고 있음)

Working memory

Context-aware System Architecture



Transceiver Unit

Multi Sensor Module Unit

High Performance Processing Unit
- Deep Learning Neural Netwoks(DNN)
- Convolution Neural Netwoks(CNN)
- Markov Prediction
- Stochastic Probability Layer Modeling

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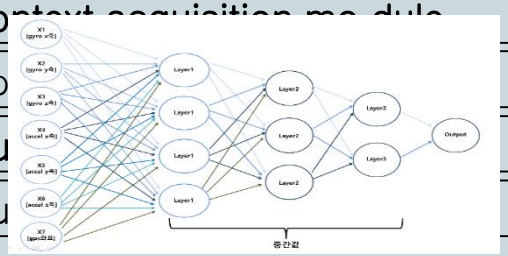
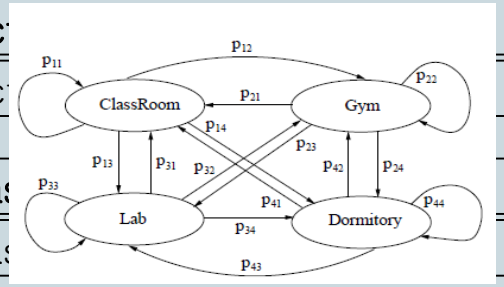




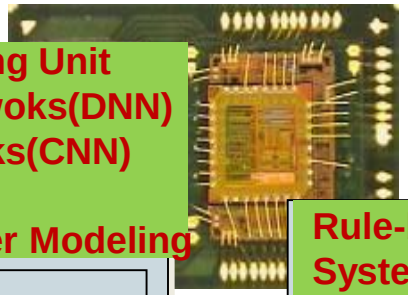
Rule-based System Unit

- High-level Context Processing
- Context –aware Service Coordination
- Context –aware State Machine
- Context –aware Sequential Machine

Blackboard (DB를 가지고 있음)

Working memory

Context-aware System Architecture



Transceiver Unit

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High Performance Processing Unit
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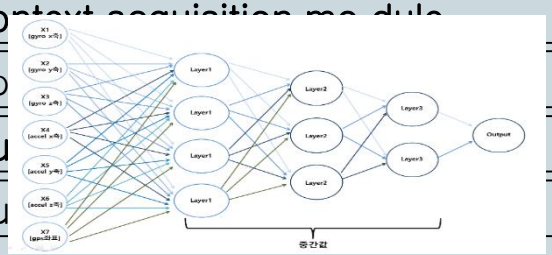


Ac

Ac

$$P = \begin{pmatrix} p_{1,1} & \cdots & p_{1,N} \\ \vdots & p_{N/2,N/2} & \vdots \\ p_{1,N} & \cdots & p_{N,N} \end{pmatrix}$$

Ta

Task processing module

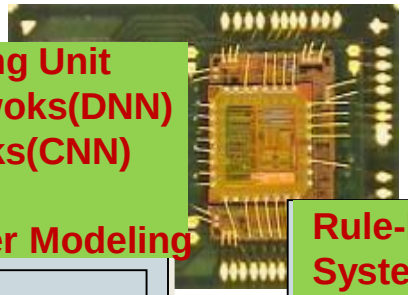
Rule-based System Unit

- High-level Context Processing
- Context –aware Service Coordination
- Context –aware State Machine
- Context –aware Sequential Machine

Blackboard (DB를 가지고 있음)

Working memory

Context-aware System Architecture



Transceiver Unit

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High Performance Processing Unit
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Communication Unit

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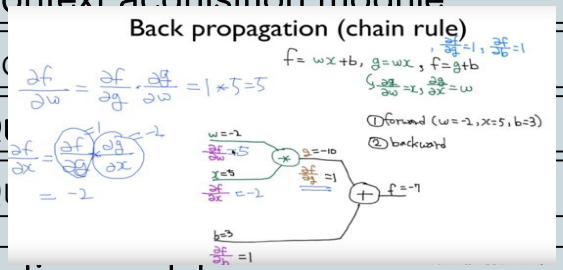
Context acquisition module



Action module

$$P = \begin{pmatrix} p_{1,1} & \cdots & p_{1,N} \\ \vdots & p_{N/2,N/2} & \vdots \\ p_{1,N} & \cdots & p_{N,N} \end{pmatrix}$$

Rule-based System Unit

- High-level Context Processing
- Context –aware Service Coordination
- Context –aware State Machine
- Context –aware Sequential Machine

(Reference Data value 가지고 있음) Blackboard (DB를 가지고 있음) Working memory

Context-aware System Architecture

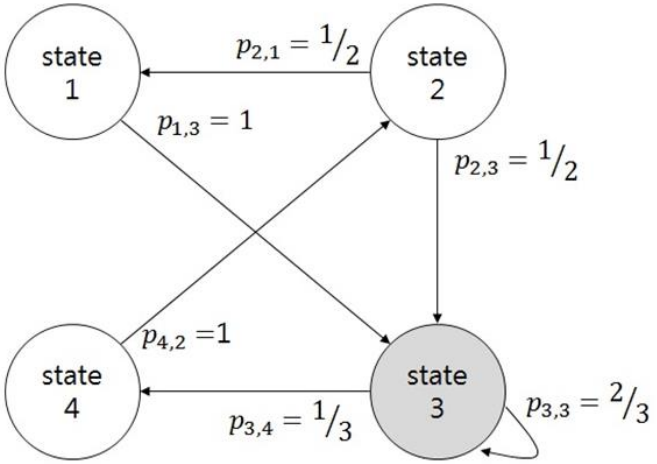
- 노드의 이동 속성 정보를 이용한 천이 확률 매트릭스 생성

시간(t)	t_0	t_1	t_2	t_3	t_4	t_5	t_6	t_7
상태(S)	2	3	4	2	1	3	3	3

(a) 시간 따른 상태 집합 S

$$P = \begin{bmatrix} 0/1 & 0/1 & 1/1 & 0/1 \\ 1/2 & 0/2 & 1/2 & 0/2 \\ 0/3 & 0/3 & 2/3 & 1/3 \\ 0/1 & 1/1 & 0/1 & 0/1 \end{bmatrix}$$

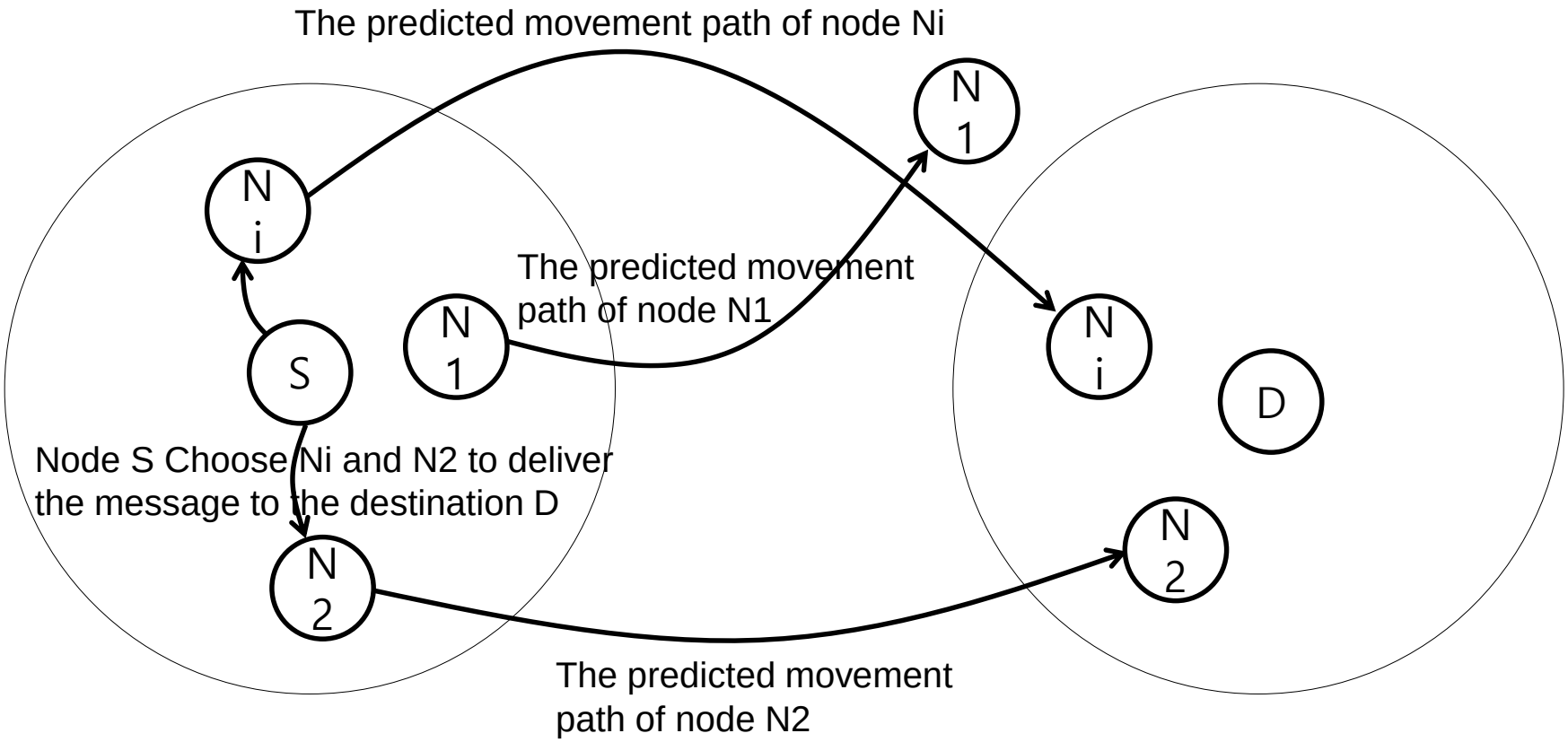
(b)상태 집합 S에 의해 생성된 천이 확률 매트릭스



(c)상태 집합 S에 의해 생성된 천이 상태도

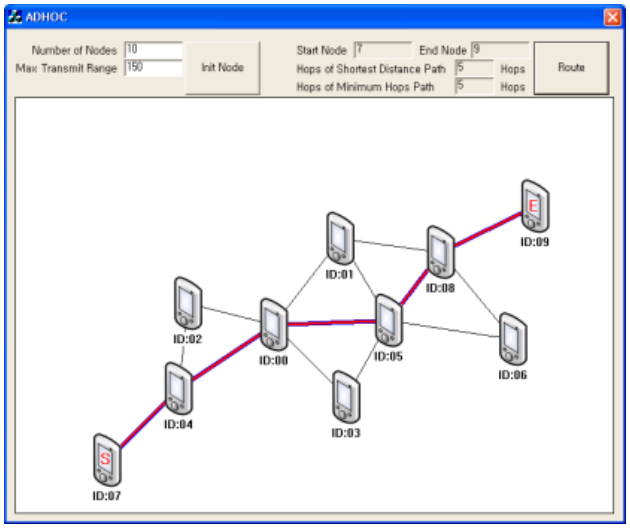
[그림 10] 상태 집합 S로 생성한 천이 확률 매트릭스 및 다음 상태 예측 과정

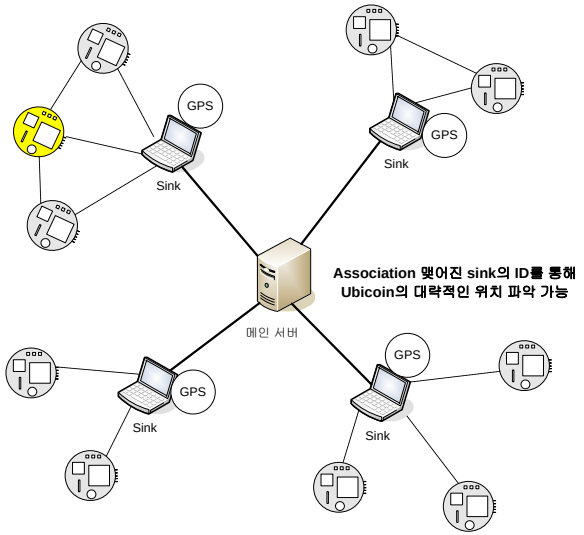
Context-aware System Architecture

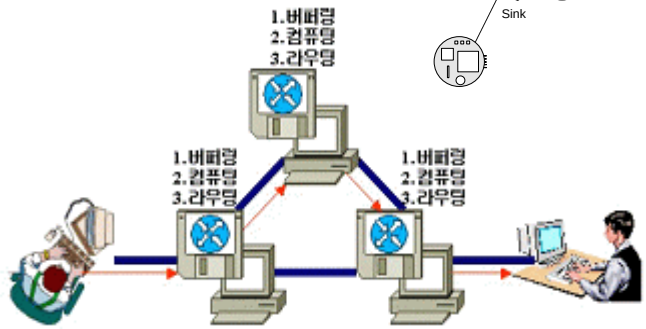


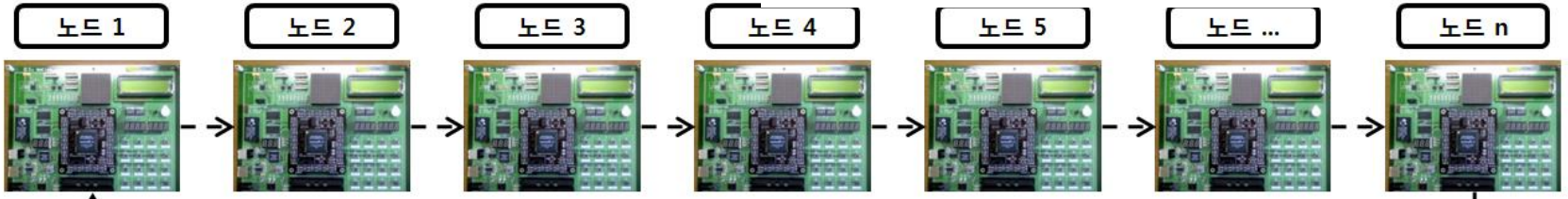
Context-aware Inference Network System

- 무선 송.수신 센서네트워크 기술
  - Ontology Knowledge based 경로탐색 협업 메시지 구조
    - Context-awareness message processor
  - Inference Sensor Network 구성
    - Active Network 응용









https://www.youtube.com/channel/UC61GAF9f8y2xT3EBl5ntSWg

Context-aware Inference Network System
Schedule for research of UoC