

CAMUS

TV

^{1, 2, 3, 4}
{akmoon¹, hkim²}@etri.re.kr
^{3 4}
ptnrev93³@mining.ssu.ac.kr, swlee⁴@ssu.ac.kr

Intelligent TV Recommendation Service Agent Using CAMUS Context-Aware Middleware

Aekyung Moon¹Hyun Kim²
Software Research Team, ETRI^{1 2}
SeongJin Lee³, Soowon Lee⁴
Dept. of Computing, Graduate, School, Soongsil University^{3 4}

TV

(Context)

CAMUS(Context-Aware Middleware for URC Systems)

TV

CAMUS

가

Keyword : Ubiquitous, Personalization, Context-aware, Sensor, Recommendation

1.

TV

가

가

가

[7].

[1].

TV

CAMUS(Context-

가

가

Aware Middleware for URC Systems)

TV

. CAMUS

가

가

가

[2,3,4,5,6].

[8].

TV
 CAMUS 가
 가 가 (Active Badge)
 . 2 . Cyberguide[12] Georgia
 3
 CAMUS . 4 가
 5 GPS
 IR positioning . Shopping
 Assistant[13] AT&T Bell
 2. 가
 가 Schilit . Conference Assistant[14] Georgia
 (Computing Context),
 (User Context),
 (Physical Context) 3 가 가 가 가
 [9]. People and Object Pager[15] Kent
 , , , , , [16]
 smart dust
 . Chen
 3. CAMUS 가
 (Week), (Month),
 [10]. , , , , ,
 가 CAMUS 가
 가
 가
 [8]. 가
 . Call Forwarding[11]
 Olivetti

CAMUS

legacy

3. 1 CAMUS

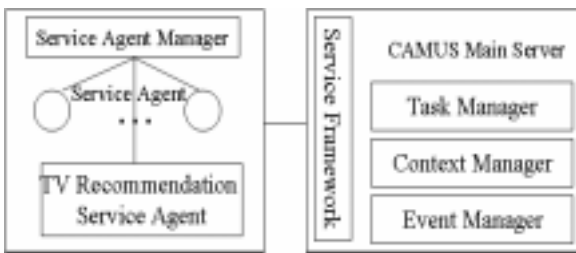
CAMUS
(Main Server)
Agent Manager

1

CAMUS

(Service Interface)

(Implementation)



(1) CAMUS

가 (Property)
(Operation)

id location

RFID

가

가

, RFID

가

3. 2 CAMUS

CAMUS

CAMUS

CAMUS

가

가

CAMUS

가

. CAMUS

(Rule)

가

가

가

(Speech

Recognizer)

가

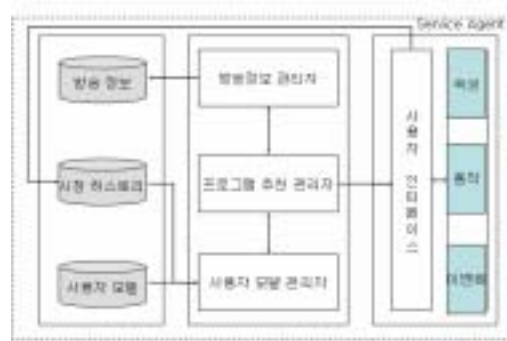
CAMUS

3 가

3.3

CAMUS

(Sobot)



(2) TV

4 TV

CAMUS

TV

(Name)

(Value)

. CAMUS

CAMUS

가

. TV

TV

가

. CAMUS

. TV

ECA(Event-Condition-Action)

가

TV

4.1 TV

2

TV

•property int tv_recommendation_number:

PDA

TV

“5”

CAMUS

•property int tv_obtain_interval:

TV

가

“2”

(Event)
 CAMUS
 •property int tv_recommendation_start_limit: 10
 “10” 10
 •property int tv_recommendation_end_limit: , SpeechRecieved , RFID
 “10” UserEntered 가
 10 TV
 •property string tv_channel_code: 가
 가
 4.2 TV CAMUS
 TV CAMUS
 UserEntered SpeechReceived
 CAMUS UserEntered TV
 가
 •getRecommendationList(String uid) RFID
 RFID
 가 가 UserEntered id
 가 SpeechReceived
 [17]
 CAMUS
 TV Java PLUE(Programming Language
 for Ubiquitous Environment)
 TV 3 PLUE
 TV
 가 TV TV
 “ on ”
 (event description) , “ if ”
 , if “ ”
 •userModelUpdate()
 가 가

```

on (UserEntered e)
  if (e.location = TV_Zone) {
    $place.tvserviceagent.getRecommendationList(e.id);

```

```

}
(a)
on (SpeechReceived e)
if (e.symbol = "tvon") {
    $place.tvserviceagent.getRecommendationList(e.id);
}
(b)

```

CAMUS

TV

(3) TV CAMUS

CAMUS

4

PDA

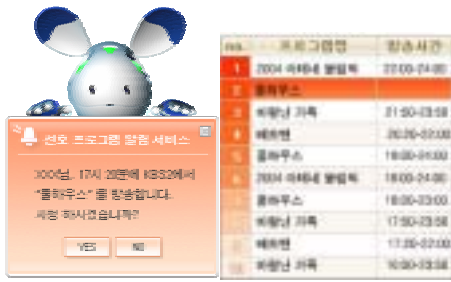
가 TV (3-(a))

getRecommendationList(id) 가

가 id

가 “ ”

(3-(b)) SpeechReceived



(4)

5.

TV 가

가

가

- [1] J. Ryu, M. Kim, J. Nam, K. Kang and J. Kim, "User Preference based Intelligent Program Guide," *Journal of The Korean Society of Broadcast Engineers*, Vol. 7, No. 2, pp. 153-167, 2002
- [2] S. Yoo, H. Lee, H. Lee and H. Kim, "A Content-based TV Program Recommender," *Journal of KISS*, Vol. 9, No. 6, pp. 683-692, 2003
- [3] L. Ardissono, et al., "Personalized recommendation of TV Programs," *LNCS*, No. 2829, pp. 474-486, 2003
- [4] W. Lee and T. Yang, "Personalizing Information Appliances: a Multi-agent Framework for TV Programme Recommendations," *Expert Systems with Applications*, Vol. 25, pp. 331-341, 2003
- [5] Y. Blanco-Fernández, et al., "AVATAR: An Advanced Multi-agent Recommender System of Personalized TV Contents by Semantic Reasoning," *LNCS*, No. 3306, pp. 415-421, 2004
- [6] J. Xu, L. Zhang, H. Lu and Y. Li, "The Development and Prospect of Personalized TV Program Recommendation Systems," *Proc. IEEE Symp. Multimedia Software Engineering*, pp. 82-89, 2002
- [7] A. Ranganathan and R. H. Campbell, "A Middleware for Context-Aware Agents in Ubiquitous Computing Environments," *Middleware 2003*, LNCS, No. 2672, pp. 143-161, 2003
- [8] H. Kim et al., "A Software Robot Technology in URC," *Journal of The Korean Institute of Communication Sciences*, Vol. 21, No. 10, pp. 36-43, 2004
- [9] B. Schilit, N. Adams, and R. Want. "Context-aware Computing Applications," *Proc. IEEE Workshop on Mobile Computing Systems and Applications*, pp. 85-90, 1994
- [10] A. Dey, D. Abowd and D. Salber, "Conceptual Framework and a Toolkit for Supporting the Rapid Prototyping of Context-Aware Applications," *Human-Computer Interaction (HCI) Journal*, Vol. 16, 2001
- [11] R. Want, A. Hopper, V. Falcao and J. Gibbons. "The Active Badge Location System," *ACM Transactions on Information Systems*, Vol. 10, No. 1, pp. 91-102, 1992
- [12] G. Abowd et al., "Cyberguide: A Mobile Context-aware Tour Guide", *Wireless Networks*, Vol. 3, No. 5, pp. 421-433, 1997
- [13] A. Asthana, M. Cravatts and P. Krzyzanowski, "An Indoor Wireless System for Personalized Shopping Assistance," *Proc. IEEE Workshop on Mobile Computing Systems and Applications*, pp. 69-74, 1994
- [14] A. Dey, M. Futakawa, D. Salber, and G. Abowd, "The Conference Assistant: Combining Context-Awareness with Wearable Computing," *Proc. Symp. Wearable Computers*, pp. 21-28, 1999
- [15] P. Brown. "Triggering Information by Context", *Personal Technologies*, Vol. 2, No. 1, 1998
- [16] K. Römer, "Tracking Real-World Phenomena with Smart Dust," *LNCS*, No. 2920, pp. 28-43, 2004
- [17] M. Balabnovic and Y. Shoham, "Content-Based, Collaborative Recommendation," *CACM*, Vol. 40, No. 3, pp. 66-72, 1997