Inferring activities from interactions with objects

Philipose M., Fishkin K.P., Perkowitz M., Patterson D.J., Fox D., Kautz H., Hahnel D.

Intel Research Seattle; University of Washington; University of Freiburg; Intel Research Seattle, 1100 NE 45th St., Seattle, WA 98195; 6910 Roosevelt Way NE, #124, Seattle, WA 98115; 11341 B 17th Ave. NE, Seattle, WA 98125; Dept. of Computer Science and Eng., Paul C. Allen Center, Univ. of Washington, 185 Stevens Way, Seattle, WA 98195

Abstract: A new pattern for ADL inferencing levy radio-frequency-identification technology, data mining and a probabilistic inference engine to recognize ADL, based on the objects people use. A key aspect of pervasive computing is using computers and sensor networks to effectively infer users behavior in their environment. This includes inferring which activity users are performing, how they are performing it and its current stage. An approach is proposed that shows promise in automating some types of ADL monitoring. The sequence of objects a person uses while performing an ADL robustly characterizes both the ADL identity and the quality of its execution. The Proactive Activity Toolkit (PROACT) represents activities as a probabilistic sequence of objects used.

Index Keywords: Antennas; Automation; Computational methods; Data mining; Probabilistic logics; Problem solving; Sensors; Deployment; Inferring activities; Proactive activity toolkit (PROACT); Radio-frequency-identification (RFID) tags; Inference engines

Year: 2004
Source title: IEEE Pervasive Computing
Volume: 3
Issue: 4
Page : 50-57
Cited by: 238
Link: Scorpus Link
Correspondence Address: Philipose, M.; Intel Research Seattle, 1100 NE 45th St., Seattle, WA 98195, United States; email: matthai.philipose@intel.com
Document Type: Review
Source: Scopus
Authors with affiliations:

1. Philipose, M., Intel Research Seattle, Intel Research Seattle, 1100 NE 45th St., Seattle, WA 98195
2. Fishkin, K.P., Intel Research Seattle, Intel Research Seattle, 1100 NE 45th St., Seattle, WA 98195
3. Perkowitz, M., Intel Research Seattle, 6910 Roosevelt Way NE, #124, Seattle, WA 98115
4. Patterson, D.J., University of Washington, 11341 B 17th Ave. NE, Seattle, WA 98125
5. Fox, D., University of Washington, Dept. of Computer Science and Eng., Paul C. Allen Center, Univ. of Washington, 185 Stevens Way, Seattle, WA 98195
6. Kautz, H., University of Washington, Dept. of Computer Science and Eng., Paul C. Allen Center, Univ. of Washington, 185

Stevens Way, Seattle, WA 98195

7. Hähnel, D., University of Freiburg, Intel Research Seattle, 1100 NE 45th St., Seattle, WA 98195

References:

1. McDonald, A., Curtis, J., (2001) Not Alone: A Good Practice Guide to Working with People with Dementia in Sheltered Housing, , Anchor Trust
2. Schmidt, A., Gellersen, H.-W., Merz, C., Enabling implicit human computer interaction: A wearable RFID-tag reader (2000) Proc. 4th Int'l Symp. Wearable Computers (ISWC 00), pp. 193-194. , IEEE CS Press
3. Patterson, D., Inferring high-level behavior from low-level sensors (2003) Proc. 5th Int'l Conf. Ubiquitous Computing (Ubi-Comp 2003), pp. 73-89. , LNCS 2864, Springer-Verlag
4. Perkowitz, M., Mining models of human activities from the web (2004) Proc. 13th Int'l World Wide Web Conf. (WWW 2004), pp. 573-582. , ACM Press
5. Heylighen, F., Mining associative meanings from the web: From word disambiguation to the global brain (2001) Proc. Int'l Colloquium: Trends in Special Language & Language Technology, pp. 15-44. , Antwerpen
6. Mihailidis, A., Fernie, G., Barbenel, J.C., The use of artificial intelligence in the design of an intelligent cognitive orthosis for people with dementia (2001) Assistive Technology, 13, pp. 23-39