R-CoRe:

A Rule-based Contextual Reasoning Platform for AmI

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Reasoning about Context in AmI

- Challenges
  - Imperfect context information
  - Heterogeneous entities
  - Highly dynamic and open environments
  - Distributed context information
  - Unreliable wireless communications
  - …restricted by the range of transmitters

R-CoRe

- Main Features
  - **Distributed**
  - **Rule-based**
  - **Non-monotonic**
  - **Preference-based conflict resolution**
  - **Dynamic & Adaptive**

- Underlying technologies
  - **Contextual Defeasible Logic (CDL)**
    - a distributed version of Defeasible Logic
  - **Kevoree**
    - a s/w framework for Distributed Dynamically Adaptive Systems

Contextual Defeasible Logic

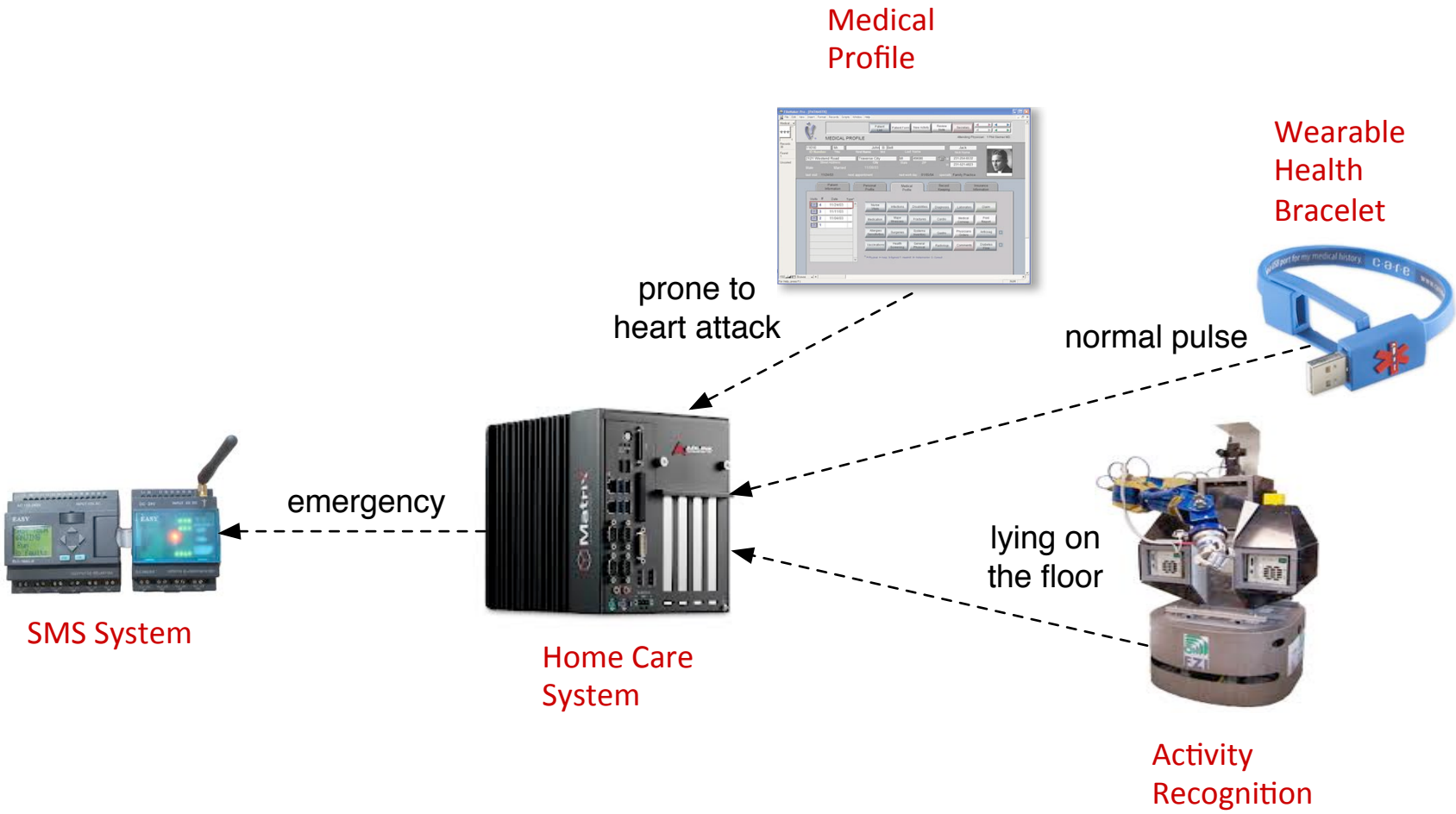
- Overview
  - The local knowledge of each agent is modeled as a Defeasible Logic theory (**context**)
  - **Mapping rules** enable information exchange between contexts
  - **Preferences** on contexts are used to resolve conflicts caused by the interaction of mutually inconsistent contexts.

Kevoree

- Overview
  - Open-source software platform
  - Provides tools to build, adapt and synchronize distributed systems
  - Any sensor, software application, web service can be represented as a **component** (with I/O ports)
    - In R-CoRe, each context is implemented as a Kevoree component
  - **Channels** represent different types of communication among components (TCP/IP, email, SMS, etc.)
    - In R-CoRe, contexts exchange information through Kevoree channels

Available at www.kevoree.org

R-CoRe in action

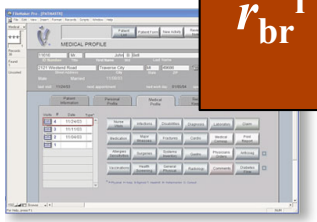


R-CoRe in action

$r_{med}^{l} : \rightarrow (med : \text{proneToHA})$

$r_{br}^{l} : \rightarrow (br : \text{normalPulse})$

$r_{sms}^{m} : (hcs : \text{emergency}) \Rightarrow (sms : \text{dispatchSMS})$



prone to heart attack

normal pulse

emergency

lying on the floor

$r_{hcs}^{m1} : (br : \text{normalPulse}) \Rightarrow (hcs : \neg \text{emergency})$

$r_{hcs}^{m2} : (arm : \text{lyingOnFloor}), (med : \text{proneToHA}) \Rightarrow (hcs : \text{emergency})$

$T_{hcs} = [med, arm, br]$

$r_{arm}^{l} : \rightarrow (arm : \text{lyingOnFloor})$

R-CoRe:

A Rule-based Contextual Reasoning Platform for Aml

You can download the demo and test it yourself from

https://github.com/securityandtrust/ruleml13

We would really appreciate your feedback!!!

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