Can machines observe the people, products and places of the physical world in real-time, digitally represent them, and understand the context of their physical and digital relationships?

**In other words:**

**Is ubiquitous machine-contextual-awareness a possibility?**

Several recent trends support this hypothesis:

- Billions of devices can be radio-identified at several meters distance [1].
- Heterogeneous Internet-connected radio-identification infrastructure [2].
- Widespread adoption of open wireless packet protocols [3].
- People, products and places are digitally represented on the Internet.
- Industry-pressure is standardising such digital representation.

Is ubiquitous machine-contextual-awareness a possibility?

Digital Representation

Machines can associate a radio-identified device with its corresponding URL. This is accomplished through a lookup table [4] or via an explicit URL in the radio payload.

**References and Links**


**Human Contextual Awareness**

Humans can identify physical actors and the semantic relationships between them.

**Machine Contextual Awareness**

Identifying, associating and representing real-world devices in real-time, including their semantic relationships, enables ubiquitous machine-contextual-awareness.

Ongoing work is focused on the following:

- An open, distributed and secure lookup table (ID → URL)
- Development of open source machine-contextual-awareness software
- Potential application to passive RFID (ex: EPC Gen 2)

The authors invite collaboration from the scientific and industrial communities.

**Machine Identification**

Machines can detect and identify devices via Active RFID and relay this information to the Internet in real-time.

**Digital Representation**

People, products and places are digitally represented on the Internet.

This digital representation is accessed via a URL.

**Machine Association**

Machines can associate a radio-identified device with its corresponding URL. This is accomplished through a lookup table [4] or via an explicit URL in the radio payload.

**Machine Representation**

Machines can represent people, products and places, as well as their semantic relationships, using JSON-LD [6] and Schema.org [7], which, thanks to adoption by popular search engines, are becoming a de facto standard.

```
{  
  "@context": "http://schema.org",  
  "@type": "Person",  
  "name": "Barn Owl!",  
  "image": "http://person.info/photo.jpg",  
  "url": "http://person.info"  
}
```

This representation can easily be embedded in a webpage on the Internet.

Jeffrey Dungen, George Koulouris, Imran Zaidi, Juan Pinazo Neto / reelyActive, Montréal, Canada