

# Working Definitions

## *Ethical Guidance for Research and Application of Pervasive and Autonomous Information Technology (PAIT)*

*March 3-4, 2010, Cincinnati, Ohio*

<http://poynter.indiana.edu/pait/>

The PAIT Planning Committee developed these working definitions to help guide our efforts. They are intended to be useful rather than conclusive.

For the purposes of this workshop, we consider terms such as “pervasive computing,” “ubiquitous computing,” “ubicom,” “everyware,” “ambient intelligence,” and “ambient computing” to be roughly synonymous. We use the term “information technology” to highlight the important role of hardware not usually associated with computers, such as advanced sensing and communication devices, involved in most pervasive IT. Our shorthand for these technologies and their application is PAIT.

**Definition:** Pervasive IT devices are small and/or unobtrusive (compared to a desktop computer, for example) and can be embedded in everyday objects (e.g., carpets, clothing, doorways, toys) to collect and/or act upon data generated by or important to human activity. Often the data collected can be wirelessly transmitted, stored, and shared on the Internet. In some instances, several devices will share data and work together toward a common goal. Some will be unobtrusive and generally unnoticed while others will interact perceptibly with people (asking questions, giving reminders).

Some pervasive technologies are also autonomous, or self-directing.

**Definition:** Autonomous systems are typically computer-based devices augmented with sensing devices beyond those found on a typical desktop computer, including analogues to vision and hearing. An autonomous system can operate for extended periods of time without direct human intervention and alter the way it performs by learning from its own experience. Some autonomous systems can also adapt to particular environments (e.g., by moving safely through a particular house) and some can perform based on non-linear calculations (e.g., Bayesian inference) such that performance cannot be completely predicted or characterized from the system’s programming. Many autonomous systems act only on and through data (as do most desktop computers), but others also act on the physical world (e.g., by welding joints). The latter are considered robots without regard to their physical shape or mobility status (they need not be humanoid and they can be bolted to a factory floor).