

Feature Ubiquitous Computing at AIST

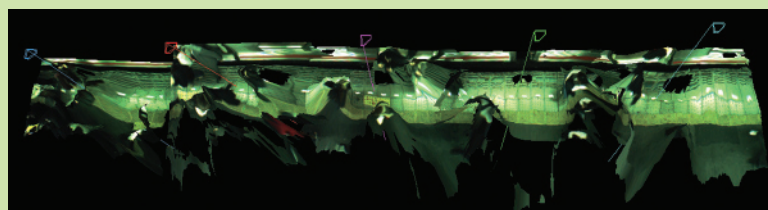
Increasing Convenience and Universality

Technology to Assist Humans

Technologies are progressing rapidly towards creating ubiquitous information societies where computers and networks exist universally.

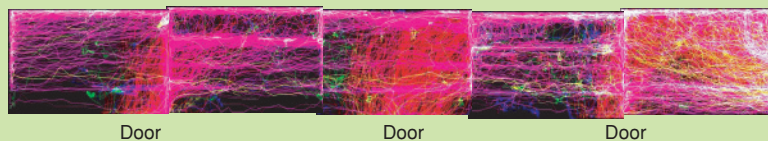
The question is how people will use computers in such a vast information infrastructure. We hope that computers will be able to serve more directly as the "backbone" in people's life and become capable partners that provide unobtrusive, but firm support to us. They will be no longer mere tools which users need to take out of their bags or pockets or operate by using a mouse.

The computers will exert full potential in a variety of basic technologies that interface with people's activities. The application of these technologies will bring about the systems which enable hands-free control home appliances, ensure people's safety, gently assist the disabled, navigate directions, give guidance for working procedures, provide information as required, and so on. This feature article introduces AIST research projects on the technologies which support ubiquitous information societies, through the examples of practical application.



This is a momentary image of a train platform extracted from a series of 3D images shot at 12 frames/sec by five stereo cameras. As the subject's figure is captured three-dimensionally, the position, height and moving direction can be automatically calculated.

Stairs



The paths of the passengers of ten trains (one train runs per hour, i.e. for ten hours) were recorded and color coded according to directions of paths. The diagram clearly represents the flows of the passengers getting off the trains and shows that most of the people use the stairs on the right hand side.

Invisible guardians

Tragic accidents at train stations are frequently reported. To prevent such accidents, AIST has developed a system to ensure people's safety in wider areas by installing many 3D sensors (ubiquitous stereo vision). By the use of 3D information, the system is able to select and track a target person in an extensive area with no blind spots and is unaffected by obstructive factors such as people's clothing, illumination, sunlight, shadows, background, congestion and so on. In practice, the research team successfully illustrates the paths of the people on the platform from the first train to the last train. Furthermore, it is possible to detect a critical condition before a passenger falls from the platform so that the technology can be applied to the system to warn and protect people who are in danger in public places. The system will realize the "ubiquitous information environment that ensures human security".



Reliable, low-key assistance for humans in everyday life

The elderly lady in the picture has a "My Button", an electronic universal pass. We aim at building an IT infrastructure which assists ordinary people carrying this device. With your schedule data stored in My Button, for instance, the station environment assists you to get the right ticket while automatically paying the right fare, to locate the right platform, and to take the right train. This is "Human Centered Ubiquitous Information Environment".

In good old days ↑
But recently... ↓

