



Moving Human Electromagnetic Scattering Simulator



Introduction

This system automatically detects humans within the sensor's field of vision. The characteristics of each person detected are automatically determined. This data, along with the found person's position, is wirelessly transmitted to a PC. A PC can then use this data to create an electromagnetic scattering simulation, and display information about the persons being tracked.



Requirements

- A lightweight, portable system
- Read an imaging device with a microcontroller
- Take advantage of open source software
- Uses Ethernet or Wi-Fi
- Identifies humans and characteristics
- Runs AFRL provided software

Budget

Item	Cost
PandaBoard	\$179
ASUS Xtion	\$160
Power System	\$61
Enclosure	\$25
	\$425/\$500



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Software

Running on the PandaBoard is a network server program, which includes a routine to take advantage of the open source software OpenNI. OpenNI is able to automatically relay data about humans found by the ASUS Xtion. A PC application is used to retrieve data from the PandaBoard. This application is able to display the relative location of the persons found, and is capable of initializing an AFRL electromagnetic scattering simulation.

Hardware

The system utilizes a microcomputer board called the PandaBoard, which runs the Linux operating system. This board is enclosed in a case, along with a battery capable of powering the system. Mounted on the enclosure is an ASUS Xtion. This is a powerful imaging device capable of detecting motion and depth, and is connected to the PandaBoard by USB in order to deliver sensor information.

Results

The system is capable of relaying data about humans found by the ASUS Xtion. The PandaBoard successfully receives data from the sensor. This data is then transmitted over Wi-Fi, and a PC application is able to connect to the box and retrieve positions and characteristics of multiple people within the sensor's range. The accuracy of the calculated characteristics is sometimes inconsistent, however the reported positions are generally correct.

