Automatic Detection With the Integration Of Several Devices

PhD in Computer Sciences

Sonia E. Cardenas D., M. Carmen Juan L.
socar@doctor.upv.es, mcarmen@dsic.upv.es

DEPARTAMENT DE SISTEMES INFORMÀTICS I COMPUTACIÓ

UNIVERSITAT POLITÈCNICA DE VALÈNCIA

General Objective

To use devices, software, concepts of vision and image processing to develop applications for detecting the proximity with an environmental device.

Specific Objectives

1. To study and evaluate environmentals devices to determine the possibility of integrating with other kind of devices.
2. To develop a system that integrates several for detecting the user's movements and proximity to environmental devices.
3. To determine the algorithm that offers more accuracy and speed.

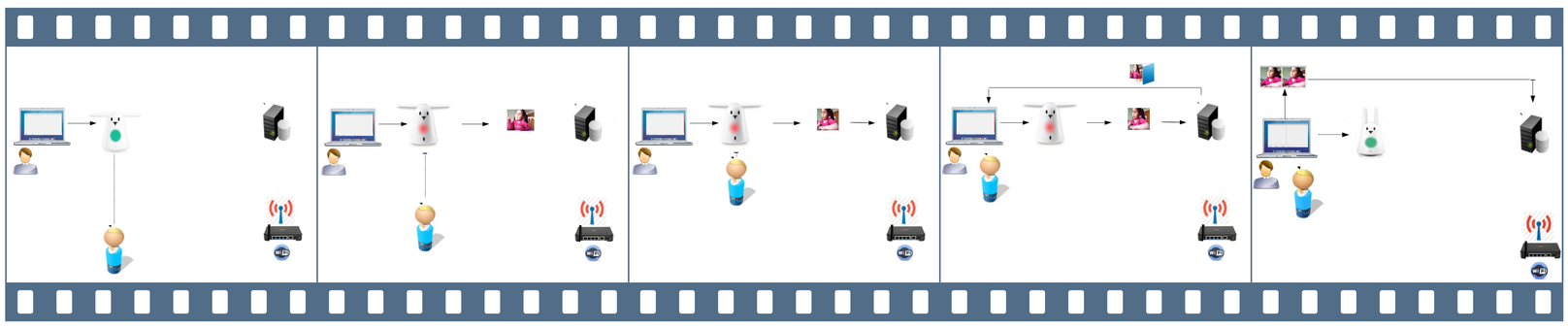
Expected Results

1. Contribute to the CHILDMNEMOS project.
2. To integrate automatic detection with auditory stimuli.
3. A system that integrates environmental devices for detection of user's movements and user's proximity.
4. To develop alternative applications for groups with visual or motor disabilities to improve their quality of life.
5. To identify the advantages and disadvantages of using these new technologies for detection.

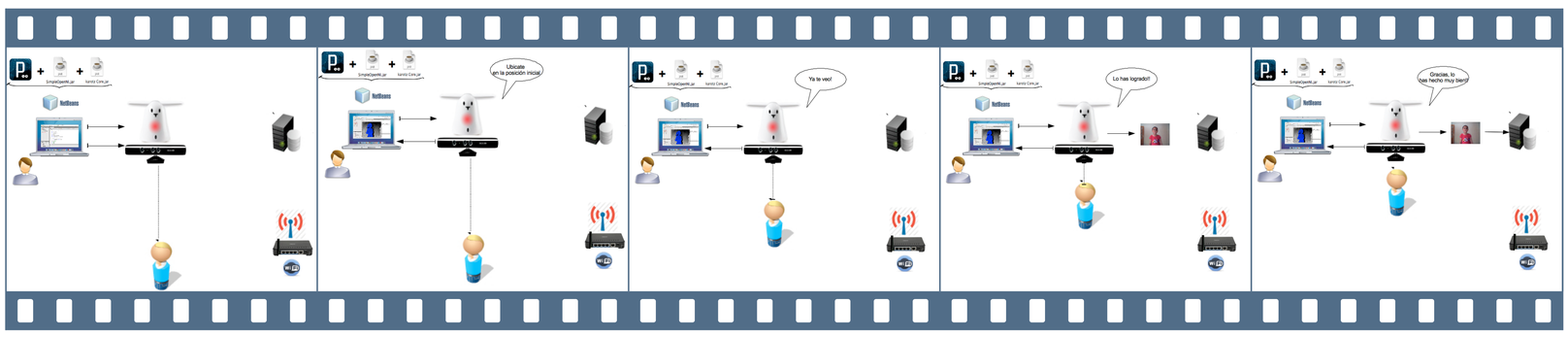
Key stages

1. State of the Art and Perspectives: Detection, Vision and Image Processing [1] [2].
2. Funtional Specifications and Development of Applications.
3. Test of Applications.
4. Statistical Analyze of Results.
5. Conclusions and Contributions.

Applications



Steps To Algorithm 1

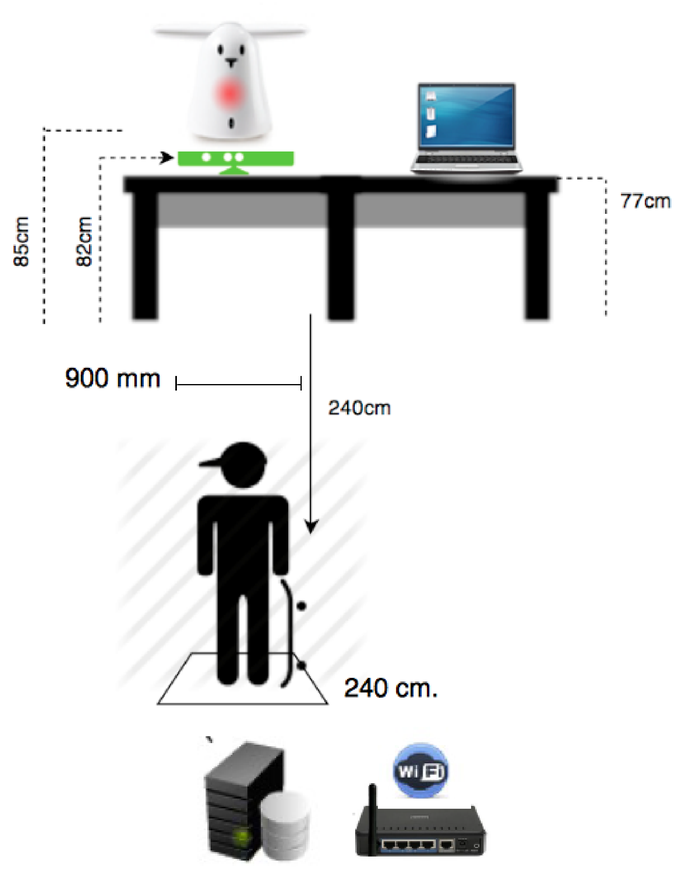


Steps To Algorithm 2

Algorithm 1: Detection of proximity only with a Karotz. Algorithm for Face Recognition and Cascade Classifier [3]. JavaCV interface with OpenCV, Java-NetBeans, Java Media Framework.

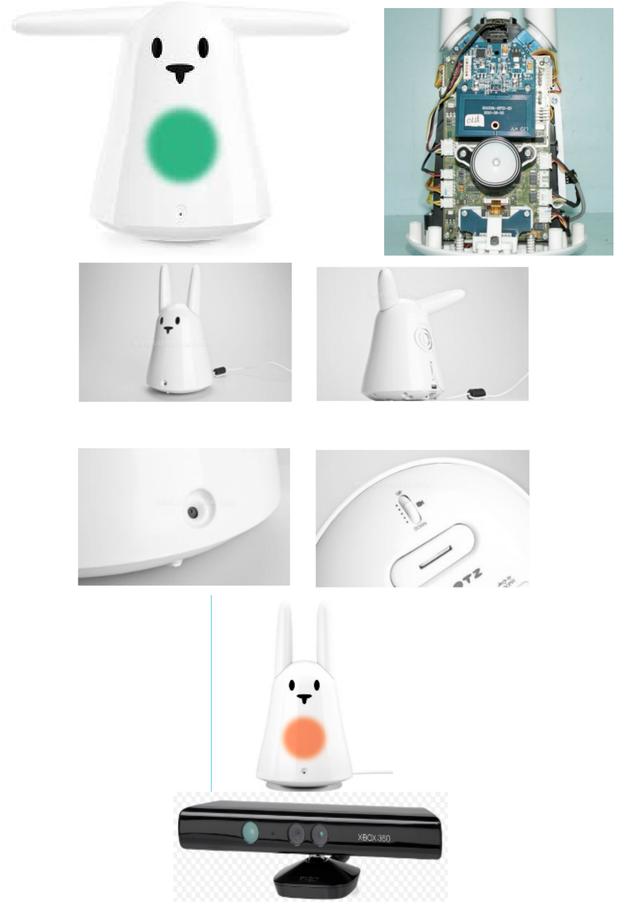
Algorithm 2: Detection of proximity with the integration of a Karotz and a Kinect. SimpleOpenNI, wrapper of OpenNI and NITE. Processing, Karotz SDK, Java, NetBeans.

Scene



The user interacts with the application without requiring to wear any devices or touch them.

Devices



This is a first work that integrates Karotz and Kinect devices for automatic detection.

Future Works

- To study other environmental devices to develop useful applications for education.
- To develop alternative applications for groups with some kind of visual or motor disabilities.
- To process images to interpret the gestures of people.

References

[1] K. Iida and K. Suzuki.
Enhanced Touch: A Wearable Device for Social Playware. In *International Conference on Advances in Computer Entertainment Technology. Article number 83. (2011).*

[2] J. Shotton, A. Fitzgibbon, M. Cook, T. Sharp, M. Finocchio, R. Moore, et al.
Real-Time Human Pose Recognition In Parts From Single Depth Images. In *IEEE Computer Vision and Pattern Recongnition Conference. 1297-1304. (2011).*

[3] P. Viola and M. J. Jones.
Robust Real-Time Face Detection. In *International Journal of Computer Vision 57(2). 137- 154. (2004).*