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PORTUGAL

Fig1. Testing space with multiple colors.

ALIAS

AMBIENT LIGHTING INTEGRATED ASSISTANCE SYSTEM

Problem

Nowadays a lot of knowledge about the effects of lighting on human health and mood exists and is still growing. However, this knowledge isn't generally being put into practice.

Light is something that surrounds us every day and everywhere, therefore knowledge of it can also be used every day from dawn to dusk and everywhere like home, schools, health facilities, workplace or even outside. Artificial lighting is harmful if used incorrectly, affecting the normal circadian rhythm's pace and therefore several biological properties. Elderly people are further affected by artificial lighting since they prevail more time inside buildings, under the effect of artificial lighting, and have usually more health problems.

Goals

This work aims to provide a personalized wireless ambient lighting for assistive environments. The main idea is the usage of ambient lighting as a communication channel and as a health support system. Knowledge of circadian rhythm and colored lighting is used to provide an improved self-healing environment. Other features include the reaction to external events captured by sensors, changing the lighting status in order to serve as a visual communication and notification channel, readily understood.

In the future, the tool can also allow to put in practice and test existing theories and studies about lighting, colors and circadian rhythm effects on humans.

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Key Features

- Update lights
- Create groups of lights
- Define scenes
- Create rules
- Automatically update lights to promote circadian rhythm
- Turn on/off rules and circadian rhythm updates
- Update lights based on smartphone events

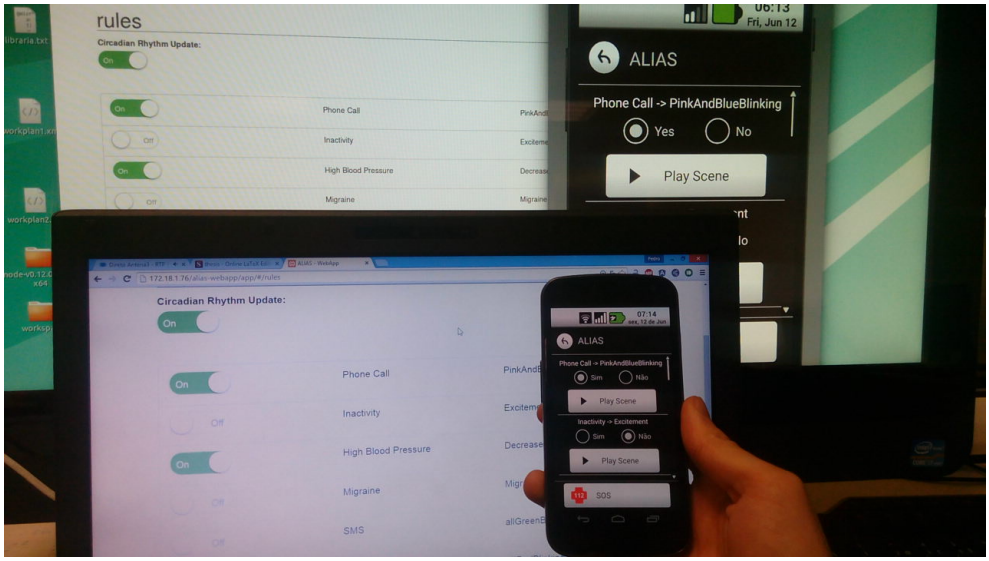

Fig2. Final applications on Web browser and Android smartphone.

The System

This work is integrated with the Smart Companion project that is targeted for elderly people and their caregivers.

The system is composed by an Android application aimed for the elderly, a web application for the caregivers developed on AngularJS, a mongoDB Database for storing all necessary data, and a NodeJS web server that is in charge of all communications to the bridge, which is responsible for managing the light actions.

Since the entire system is bonded (by the Web server) and continuously communicating via Socket, then if any client Application asks the Web server to execute any action, all other client applications will be notified about it.

Future Work

Mobile App: integration with external sensors; integration with medication reminders.

Web App: Improvements on the User Interface (UI); Add the option to edit scenes; Login/logout features.

Web Server: Add feature to personalize rules for each smartphone.

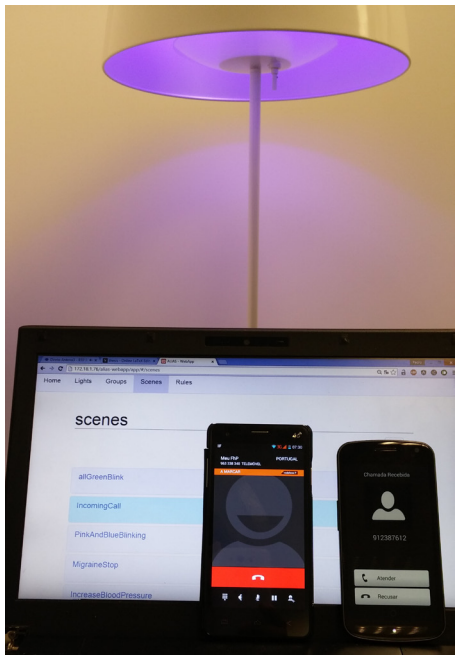

Fig3. System reaction to a phone call.