大学名	長崎大学		
University	Nagasaki University		
外国人研究者	ジョエル　フェマンド　パロミノ　マスコ		
Foreign Researcher	Joel Fernanndo Palomino Masco		
受入研究者	石松　隆和	職名	教授
Research Advisor	TAKAKAZU ISHIMATSU	Position	PROFESSOR
受入学部/研究科	工学研究科		
Faculty/Department	Graduate School of Engineering		

＜外国人研究者プロフィール/Profile＞

国　籍	ペル
Nationality	Peru
所属機関	ペルーポンチフィシア大学
Affiliation	Pontificia Universidad Catolica del Peru
現在の職名	助手
Position	Junior Researcher
研究期間	２ヶ月
Period of Stay	two months
専攻分野	電気工学
Major Field	electric engineer

タブレットを利用する環境制御装置

＜外国人研究者からの報告/Foreign Researcher Report＞

①研究課題　/　Theme of Research

To help disabled people to have an independent and happy life, devices that can help them operate the computer are needed. Enabling disabled people to use the computer can open the possibility to manage home appliance at his own will and also to use the phone to
The objective of this research is to develop an environmental control system for the disable people operated by a touch sensor that can be easily operated by the patient.
The developed system will use a tablet as human interface to control the home appliances; and will have a control unit that will send signals to the home appliances. The selection of the screen button will be done by a sensor that can be activated through slight finger

②研究概要　/　Outline of Research

The Tablet is a visual interface that shows the control buttons to manage the home appliances. The application automatically blinks each button sequentially until the desire option is highlighted.
In the case of the touch sensor it was noticed that the activation was very easy but the patient had to remove his finger to avoid activation. This was uncomfortable for the patient since he had to use strength to avoid hitting the sensor.
Finally the control unit contains has programmed the control signal to manage the home appliances. The communication of the Tablet, Sensor and Control device is done through Bluetooth, this makes the installation easier for the patient's family.

③研究成果　/　Results of Research

The developed control system was tested on an ALS patient located in the City of Omura. Due to his sickness he has lost the control of his lower limbs and can slightly move his fingers. In this patient both type of sensors were tested under different hand positions.
In the case of the touch sensor it was noticed that the activation was very easy but the patient had to remove his finger to avoid activation. This was uncomfortable for the patient since he had to use strength to avoid hitting the sensor.
With the pressure sensor the situation was different the patient could leave his hand on the sensor and activate it just by pushing a bit harder. This was comfortable for the patient since he could rest his hand. Finally the patient's family were very satisfied with system because the patient could regain independency and have a more active life.

④今後の計画　/　Further Research Plan

After testing this system the applicability in other patients, who are restricted to live on a bed due to their sickness, is possible by adapting the sensor according to patient's physical state. For patients who can slightly move their fingers the touch sensor is a good option. For this patients the sensor positioning is a key factor.
To achieve a comfortable position the sensor can be located above his hand, in this way the patient has to slightly move his finger to activate the sensor. In this way the patient can rest his fingers without worrying about activated the sensor.

＜受入研究者からの報告/Research Advisor Report＞

①研究課題　/　Theme of Research

重度障がい者のための自立を支援する環境制御装置並びに入力手段に関する研究

②研究概要　/　Outline of Research

難病（ALS）患者を対象に、介護環境の改善とコードレス化を目指してタブレットを使った環境制御装置を、他の研究者と共同で開発した。また、同様にコードレス化を目指した入力手段を開発した。開発した装置は、実際にALS患者に適用し、その有効性を確認した。

③研究成果　/　Results of Research

開発した環境制御装置および入力手段を、難病患者に適用し、その結果を以下の論文で発表した:
Chao Zhang, Joel Palomino, et al. "An Enviromental Control System for ALS Patient Using finger Movement", Journal of Mechanical Engineering (Waiting for Publication)
Masatomo Shibata, Joel Palomino, et al., "Improvement of a Joystick Controller for Electric Wheelchair User" Journal of Mechanical Engineering (Waiting for Publication)

④今後の計画　/　Further Research Plan

当該研究者と、重度障がい者の支援に関しての共同研究を推進する。その方針として、タブレットおよび無線通信を中心技術とする取り組みを行う。