Thursday, 21th October 2021

Press Release (Onsite & Zoom)

An International Project for Saving the World from COVID-19 has just been launched with the Japanese government funding!

International Research Collaboration Project

Development of Low-Cost Powered Air-Purifying Respirators (PAPRs) and Operational Tests in Hospitals in Cebu City, Philippines

Gunma University, Japan
Cebu Technological University, Philippines

Dear the press: Please refrain from reporting this content until the press release (21th October 2021, 18:00-19:00 of Japan time, GMT+9).

The detailed information (You can also download the latest version of this document):
http://www.e-jikei.org/site/KAKENHI_FosteringJointResearchB_E.htm

[Date, Time & Login information]

Date & Time: Thursday 21 October 18:00-19:00 (Japan time, GMT+9)
Meeting Style: Onsite & Online (Zoom)
Onsite: Lecture hall, Kiryu Campus, Gunma University
Zoom Login Information:
https://gunma-u-ac-jp.zoom.us/j/88545375184?pwd=MDZqdExpODMwak0zRkxMd1Z1SFUyQT09
Meeting ID: 885 4537 5184
Pass code: 927236

[Funding]

Issue number：21KK0080
Promotion of Joint International Research, KAKENHI (Grants-in-Aid for Scientific Research for FY2021)
Amount: 18,980,000JPY, Period: Oct 2021 – Mar 2024 (2.5 years)

[Summary]

Based on the low-cost Powered Air-Purifying Respirator(PAPR) (helmet type, booth type) that has been developed by us, new PAPRs, which are suitable for use in Philippines and other countries in the Southeast Asia, will be developed under the cooperation of Philippines, Singapore and Japan researchers.

The PAPRs will be tested in 3 hospitals and 2 universities in Cebu City, Philippines, which suffers from the world-longest lockdown. They will be raised to a level that perfectly and comfortably protect medical workers at high risk.

Low-cost, very-comfortable, easy-to-use PAPRs with high shielding rate for aerosols, which are suitable for daily use by the medical workers and by the general public, will be developed. Usage-rate Network Monitoring System (UNMS), which collects and analyzes the operational conditions of each PAPR, will also be developed.

A social system, which consists of PAPRs and UNMS will be proposed as the system, which can quickly resolve the infection without lockdown even when the acquisition of herd immunity through the vaccination is not in time.

[Research Plan]

In Cebu City, Philippines, based on strong local requests, with the cooperation of local universities (Cebu Technological University(CTU) and University of San Carlos (USC)) and academic societies (Philippines Society of Mechanical Engineers), Powered Air-Purifying Respirators (PAPRs) (helmet type and booth type) will be improved so that they are suitable for use in hospitals by the medical workers and for use in daily life by the general public. Usage-rate Network Monitoring System (UNMS), which monitors and analyzes the operational conditions of each PAPR, will be developed.

Problems of the prototypes will be investigated by conducting operational tests at universities (Cebu Technological University (CTU) and University of San Carlos (USC)) and at 3 hospitals (Visayas Community Medical Center (VCMC), University of Cebu Medical Center and Perpetual Succour Hospital). We will make further improvements on the prototypes, so that the medical workers at high risk can be effectively and comfortably protected.

Through joint research at Nanyang Technological University (NTU) in Singapore, which has high development capabilities, we will carry out joint research to raise the above prototypes to the commercialization level in a form suitable for Southeast Asian countries such as the Philippines.

In parallel with prototype development and verification experiments, we will try to commercialize prototypes in the Philippines, Singapore, and Japan. Then, we will try to spread it in the Philippines and other countries in Southeast Asia and put it into practical use as a social system.

The Japanese members will stay in Philippines and in Singapore and carry out joint research to develop a highly practical prototypes that match the actual situation in Philippines and other countries in Southeast Asia. Through the commercialization and popularization of prototypes (PAPR and Usage-rate Network Management System), we will propose the highly-effective alternative measures against COVID-19 suitable for Philippines and other countries in Southeast Asia. We will propose it as a novel social system with strong resistance to COVID-19 to all over the world.

[Prototype]

We have developed some prototypes of PAPRs (helmet-type and booth type) as shown in Figure 1. For an example, we will develop a face-shield-type PAPR with opening/closing mechanism as shown in Figure 2.

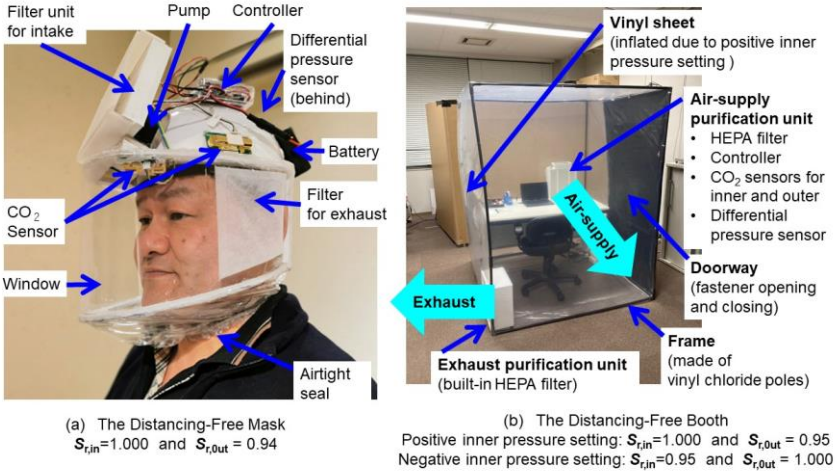

Figure 1. The developed prototypes of PAPRS

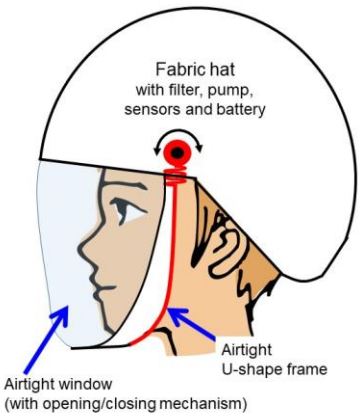

Figure 2. PAPR to be developed

[Members and the roles]

[Japan]

[1] Prof. Yusaku Fujii, PhD (Professor, Gunma University): Principal researcher.
[2] Prof. Seiji Hashimoto, PhD (Professor, Gunma University): Control algorithm, tests in Cebu.
[3] Prof. Haruo Kobayashi, PhD (Professor, Gunma University): Reliability of Electronic circuit.
[4] Prof. Kenji Amagai, PhD (Professor, Gunma University): Visualization of flow field, Optimization of fluid elements.
[5] Prof. Takao Yamaguchi, PhD (Professor, Gunma University): Acoustic characteristics.
[6] Prof. Naoya Ohta, PhD (Professor, Gunma University): Design/concept for spread as a social system.
[7] Prof. Noriaki Yoshiura, PhD (Professor, Saitama University): Usage-rate network management system.
[8] Prof. Akihiro Takita, PhD (Associate Professor, Gunma University): Network, Simple model, Programing.
[9] Prof. Anna Kuwana, PhD (Assistant Professor, Gunma University): Optimization of electronic circuit and flow field.
[10] Prof. Ayako Yano, PhD (Assistant Professor, Gunma University): Visualization and optimization of flow field.

[Philippines]

[1] Prof. Ronald M. Galindo (Cebu Technological University, Dean/Associate Professor): Management, development, evaluation/test of the prototypes in Cebu Technological University (CTU).
[2] Tabetha Saceda Galindo, M.D. (Chairman, Obstetrics and Gynecology Department, Visayas Community Medical Center (VCMC)): Management and evaluation/test of the prototype system in Visayas Community Medical Center (VCMC).
[3] Prof. Edwin Carcasona, PhD (University of San Carlos, Former Professor): Management, development, evaluation/test of the prototypes in University of San Carlos and in Philippines Society of Mechanical Engineers (PSME), Lapu-lapu chapter.
[4] Prof. Ethelda Magalang, M.D. (Assistant Professor, Cebu Doctor's College of Medicine): Management and evaluation/test of the prototype system in Perpetual Succour Hospital and/or University of Cebu Medical Center.

[Singapore]

[1] Prof. Dongwei Shu, PhD (Associate Professor, Nanyang Technological University): Management, development, evaluation/test of the prototypes in Nanyang Technological University (NTU).

[Contact points]

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