Friday, 18th March 2022

Press Release (Onsite & Zoom)

An International Research Collaboration Project for creating a lockdown-free society/nation and for saving the world from COVID-19

Opening Ceremony

International Research Collaboration Laboratory
"Distancing-Free Mask CTU Laboratory (DFM CTU Lab)"
under the cooperation between
Cebu Technological University (CTU) and **Gunma University (GU)**
in collaboration with **the PSME-Cebu Chapter**

Press Release

Low-Cost Powered Air-Purifying Respirator (PAPR)
"Distancing-Free Mask Cebu-Prototype No.1"
for the 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

[Date, Time & Login information]

Date & Time: Friday 18th March 2022. 14:00-16:00 (Philippines time, GMT+8)
Meeting Style: Onsite & Online (Zoom)
Onsite: International Conference Center, 6th fl., Centennial Bldg., CTU-Main Campus, Cebu Technological University
Zoom Login Information:
https://gunma-u-ac-jp.zoom.us/j/84259296901?pwd=dmRaWWZTYzErbGVjT0pYOUlGZkxCdz09
Meeting ID: 842 5929 6901, Pass code: 812179

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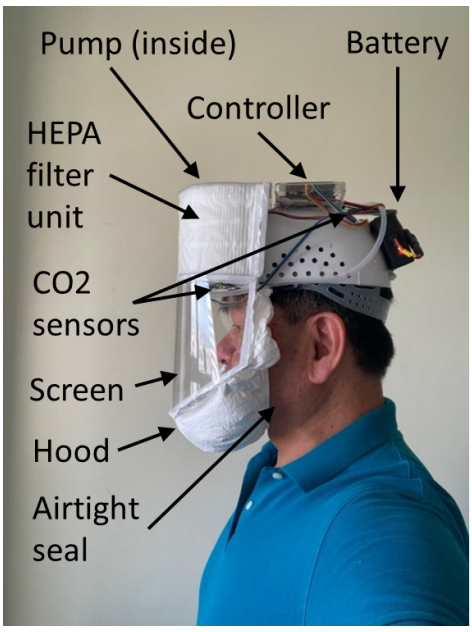
Promotion of Joint International Research,
KAKENHI (Grants-in-Aid for Scientific Research for FY2021) (Issue No. 21KK0080)
Amount: 18,980,000JPY, Period: Oct 2021 – Mar 2024 (2.5 years)
http://www.e-jikei.org/site/KAKENHI_FosteringJointResearchB_E.htm



Features

[A] Almost-perfect shielding performance
[A1] Only the purified air is supplied to inside the hood.
[A2] High performance filter, which shields 99.97% of aerosol down to 0.3µm, is used for air intake.
[A3] Internal differential pressure is kept positive, so that the outside air cannot enter to inside the hood through gaps possibly created at the airtight seal.
[B] Connectivity to smartphone and the Internet
[B1] Operational parameters can be monitored/set using smartphone via Bluetooth. It can be connected to "Wearing Rate Network Management System" to be developed.
[C] Suitability for use in hospitals
[C1] Ears are exposed, so that natural is easy.

Figure 1. "Distancing-Free Mask Cebu-Prototype No.1" developed in DFM CTU Lab

[Summary of the whole project funded by the Japanese government]

Based on the low-cost Powered Air-Purifying Respirators (PAPRs) (helmet type, booth type) that have 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. Both high-end models for hospitals and very-low-cost models will be developed. The very-low-cost model will the key for the creation of lockdown-fee society/nation.

The high-end PAPRs (approximately 200USD each), which are suitable for daily use by the medical workers, will be developed and 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.

The low-cost, very-comfortable, easy-to-use PAPRs (approximately 50USD each) with high shielding rate for aerosols, which are suitable for daily use 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 stop the infection without lockdown even when the acquisition of herd immunity through the vaccination is not in time.

[Distancing-Free Mask CTU Laboratory (DFM CTU Lab)]

Distancing-Free Mask CTU Laboratory (DFM CTU Lab) has just been established for accelerate the international research collaboration project in CTU, Philippines. Its roles in the whole project are as follows,

[1] Development of the prototypes of moderate-cost and excellent-performance PAPR “Distancing-Free Mask”, which are suitable for use in hospitals

[2] Development of prototypes of very-low-cost and good-performance PAPR “Distancing-Free Mask”, which are suitable for daily use by the general public aiming at the creation of lockdown-free society/nation. A very-low cost of approximately 20USD will be realized by making it the minimum necessary function.

[Distancing-Free Mask Cebu-Prototype No.1]

Low-cost and high-performance PAPR , “Distancing-Free Mask Cebu-Prototype No.1”, for the operational tests in hospitals in Cebu City, Philippines has just been developed as shown in Figure 1. To realize a better/natural communication, the ears of the wearer are exposed.

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

[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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