

SUSTAINABLE SOCIETY THROUGH SMART-PURCHASE OF FOOD TO ACHIEVE NUTRITION BALANCE

L. F. Teh*, P. Saha, K. Yoshikawa, T. Yamada, S. Mishima (Tokyo Institute of Technology, Japan)

*Email: teh.l.aa@m.titech.ac.jp

Food loss from business and household is one of the most concerned issues particularly in the urban areas. Statistics show that, as much as 8 million tons of food loss occurs at the supermarket, convenient store, and so on in Japan. We suggest SMART PURCHASE to deal with this problem that offers door step balanced food set. Particularly, SMART PURCHASE system is based on the concept of “Order early get cheap”, which ensures the minimal loss of perishable food from the supermarket or restaurants and confirms the nutritional balance throughout the society irrespective of the community is poor or rich.

Keywords: Food loss, Nutrition, Smart-Purchase

LEUKEMIA CAUSED BY FORMALDEHYDE

T. Yoshida, Y. Hasegawa, H. Hirano*, Z. Sheng

(Tokyo Institute of Technology, Tokyo, Japan)

*Email: hirano.h.ae@m.titech.ac.jp

These days it seems that more and more people showing interested in leukemia caused by formaldehyde (CH₂O) [US Environmental Protection Agency Integrated Risk Information System]. Leukemia is a serious disease that leads people to death. Formaldehyde released in room is one of the main causes of it. In particular, it is well known that formaldehyde promotes expansion of childhood leukemia. In this poster, we focus on three strategies to solve this problem. First, we propose some methods reducing formaldehyde in room. Second, we explain some ways to improve body resistance. Finally, we introduce some new technologies to treat leukemia.

Keywords: leukemia, formaldehyde, room environment

CHEAP TECHNOLOGY TO PRODUCE CLEAN WATER FOR REMOTE PLACE

E. Christopher*, H. Wakabayashi, Y. Aida, Li Siyi, A. Imanaka (Tokyo Institute of Technology, Tokyo, Japan)

*Email: Christopher.e.aa@m.titech.ac.jp

1.8 billion people globally use a source of drinking water that is contaminated. 9 hundreds of million people can't obtain clean water within 30 minutes from home and hundreds of thousands of children died due to an insanitary water. Therefore, it is pressing issue that everybody can acquire clean water even in remote place with low cost. Three types of way to clean water are proposed. 1. Boil water using energy produced by biomass. 2. Filtrate. 3. Use chemical.

Keywords: remote area, clean water, purify technology

HEALTH AWARENESS: A SMALL STEP, A GIANT LEAP

Masaya Iwasaki*, Yasuyuki Ueda, Fuxing Wan, Xiaohang Sun
(Tokyo Institute of Technology, Tokyo, Japan)

*Email: iwasaki.m.af@m.titech.ac.jp

Global health has improved considerably over the last half century with general global improvements in socioeconomic status. However, in the developing world, especially Sub-Saharan Africa, diseases with high mortality and morbidity remain severely prevalent, worsen the life standard of African people, largely owing to the low awareness level for health. Raising awareness is a significant approach to prevent and control these diseases. Sadly, education within schools and communities related to improving awareness is insufficient. Moreover, these poor countries even cannot guarantee the access to education for all. We therefore propose several methods and a system to promote their health awareness.

Keywords: Health awareness, Education, Sub-Saharan Africa

MEDICAL CARE SYSTEM ACCESSIBLE TO EVERYONE “ANYTIME ANYWHERE”

K. Mizuno*, K. Deekamwong, J. Ming, K. Saigusa, A. Maru
(Tokyo Institute of Technology, Tokyo, Japan)

*Email: mizuno.k.aa@m.titech.ac.jp

There are many patients who cannot receive enough medical service, especially in low population density area and developing countries. To resolve this situation, a total medical care system with smartphone applications is proposed. Patients and doctors can establish their own accounts in the system. Based on the patients' symptom, AI doctor can not only classify the illness, but also contact with the doctor specialized in the illness, and make a proposal to the patient about appropriate medical kits. Besides, in emergency situations, the system can deliver the medicine which patients need by drone, or call the ambulance.

Keywords: Medical care system, Smart phone, AI, Drone

LOCAL E-MED: A STEP TO HEALTHIER FUTURE

A. Roy*, S. Kimura, T. Miyamoto, Y. Shuai (Tokyo Institute of Technology, Tokyo, Japan)

*Email: roy.a.aa@m.titech.ac.jp

There are evidences found by WHO that there is a widening gap in terms of health not only between developed and developing countries but also between the urban and remote areas in developing countries. There are 57 countries with critical shortage of healthcare workers and 2.4 million doctors and nurses. Sadly, the doctors in the city centers are not willing to move to a remote area. Our project proposes an internet solution based faster and cheaper E-med system for health monitoring, consulting and treatment to reach for the underprivileged people and build a health data-base using Big Data.

Keywords: Health, E-medicine, Big Data

A SUSTAINABLE CLEAN WATER CYCLE IN SOUTH AFRICA

K. Sensui, S. Shimo, M. Park, and Y. Tadokoro* (Tokyo Institute of Technology, Tokyo, Japan)

*Email: tadokoro.y.ab@m.titech.ac.jp

South Africa is facing a serious water crisis. The main reason is that the climate change has strongly reduced the rainfall in the region. Since South Africa is surrounded by the sea, it is possible to supply clean water from the sea. From this point of view, this project presents a sustainable clean water cycle in South Africa. The solution consists of three parts: conversion; pipeline; and recycle. First, a water conversion method without fossil fuel is presented. An optimal networking algorithm provides a cost-efficient pipeline infrastructure. An easy recycle method is also proposed for stable supply and cost reduction.

Keywords: Water cycle, Infrastructure, Recycle

**WASTE CONTROL TO IMPROVE HUMAN LIVING CONDITIONS
IN DEVELOPING COUNTRIES**

A. Yasumoto*, P. Doun, Ali R.K, and T. Kambe (Tokyo Institute of Technology, Tokyo, Japan)

*Email: yasumoto.a.aa@m.titech.ac.jp

The increasing quantity of waste causes a problem and implements direct effects on people regarding poor living conditions including health issues. To overcome this situation promoting a new approach to the government as 'waste bank health insurance system' coming from community initiative is primarily conducted into this study. In this scheme, poor people members can create sustainable financing benefits from household wastes. The results of this study showed that the number of waste dumped to the landfill would decrease significantly and poor people may have more possibility to gain access to health services as well as to improve their living.

Keywords: waste control, waste bank, health insurance, living conditions

MULTI-PURPOSE MEDICAL CAR FOR INFANT MEDICAL SUPPORT

J. Song*, K. Kasamatsu, R. Mishima, I. Abdo, H. Shuto

(Tokyo Institute of Technology, Tokyo, Japan)

*Email: song.j.ac@m.titech.ac.jp

Poor medical support is causing thousands of deaths among infants around the world daily. Infant mortality rates of developing countries can be a very clear indicator of that as they are more than ten times higher than those of OECD countries [The World Factbook, CIA. (2017)]. About this problem, we propose providing medical support and healthy delivery environment to the infants by a Multi-purpose Medical Car (MMC). The MMC provides various kinds of support such as operations, vaccination, medical check-up, etc. The MMC system with its low cost-performance ratio could contribute to the health situation of developing countries worldwide.

Keywords: Infant mortality rate, Medical support, MMC

ARE YOU RICH? -THE WAY TO THE MENTALLY HEALTHY SOCIETY-

Y. Koga, C. Seng, K. Okamoto, H. Sakimura* (Tokyo Institute of Technology, Tokyo, Japan)

*Email: sakimura.h.aa@m.titech.ac.jp

“Health” can be divided into physical and mental health. In this study, we focus how to achieve a society consisted full of mentally rich and healthy, or well-motivated people. This is an essential topic since all societies face this problem when they reach the economically rich state by solving physical health problems which can be accomplished by a certain amount of investment and technological innovation. The rich mentality is based on three factors, self-confidence, acceptability and ambition. We point out current problems in the Japanese childhood education to develop these abilities and suggest some alternatives with quantitative analysis.

Keywords: Mental health, education, Japan


MEDICAL SYSTEM SUPPORTED BY NANO DEVICES

Y. Yamada*, H. Taira, D. Ito, J. Kim (Tokyo Institute of Technology, Tokyo, Japan)

*Email: yamada.y.bh@m.titech.ac.jp

In developing countries there are lack of hospitals and doctors, so it is difficult to discover patient's diseases early, leading to severe symptoms of disease and death in the worst case. Therefore, the medical system that detect one's illness and supply treatment whole by itself is needed. The system that we propose firstly detect one's illness or the diseased part of body by nano-machine sensing technology. Secondly the system supplies medicine or nutrition suggested by illness recognizer. This system will create an environment for appropriate treatment, and greatly reduce mortality in developing countries.

Keywords: Medical system, self-curing, nano sensing

**SOLVE SHORTAGE PROBLEMS OF HEALTH-CARE RESOURCES**

R. Funada*, H. Awano, C. Qi, D. Kitagata (Tokyo Institute of Technology, Tokyo, Japan)

*Email: funada.r.aa@m.titech.ac.jp

Most of developing countries face the shortage of health-care resource due to their lower economic developing. Here, we mainly try to solve three problems caused by the shortage of doctors, hospitals and medicines resources. The basic solution is encouraging retired doctors or organizing professional doctors to provide online medical service or directly visit the target areas. It means the activities of doctors and patients are happened in so called online hospital or movable hospital. And generally, doctors can carry some necessary medicines by themselves. But in emergency situation, medicines will be delivered to local hospital by drones.

Keywords: health-care resource, shortage, doctors, hospitals, medicines




HPV AND CANCER TREATMENT

E. Kim, T. Minato, B. Omirgul, T. Kawamura* (Tokyo Institute of Technology, Tokyo, Japan)

*Email: kawamura.t.al@m.titech.ac.jp

We define poverty as “lack of information” and “lack of money”. Cancer caused by HPV (Human papillomavirus) is increasing because of those two factors. Our solutions for this situation are “Prevention and Treatment”. Focusing on prevention, vaccination is main method. However, vaccination is not common in Japan, Korea and Kazakhstan because of lack of information and money. Public information like TV and newspapers, and health and sex education can be one of the solutions. For treatment, we focus on DNA damage repair by protein, which will be safe and affordable way compare to current treatment such as chemo therapy and surgery. Our final goal is to reduce cancer caused by HPV.

Keywords: HPV, cancer, information/money, prevention/treatment

**A WAY OF EDUCATION SYSTEM FOR USING FOOD SAFELY**

H. Nguyen*, H. Endo, E. Kawano, and M. Kojima (Tokyo Institute of Technology, Tokyo, Japan)

*Email: nguyen.h.ah@m.titech.ac.jp

Food is considered as one of the most important factors for our health. Therefore, avoiding unsafe food would be a solution for our healthy life. However, in some area of world, the situation of using food in unsafely way is still happening, that may relate to poverty. In our research, authors find that the lack of information and knowledge causes this situation. To solve this issue, an education system providing information and knowledge on how to use food in safely way would be proposed as a solution. Furthermore, a sustainable approach to this system would be suggested as well.

Keywords: food, information, knowledge, education, sustainable approach



LIMIT HIV IN SOUTH AFRICA

P. Huang*, K. Takada, C. Netrattana, and G. Sakoda (Tokyo Institute of Technology, Tokyo, Japan)

*Email: huang.p.ac@m.titech.ac.jp

Africa, especially East and Southern Africa, has the highest HIV prevalence in the world. The HIV epidemic in this region has affected the general population. In particular, gay people, sex workers, people injecting drugs, and young women are most vulnerable to infection. Such problems may be caused by poverty, gender inequality, cultural and legal barriers and so on in this area. As the effective strategy to solve these problems, HIV education and self-testing will be considered. We also suggest a new approach using SNS.

Keywords: HIV, SNS, information center


**IMPROVEMENT OF SANITATION AWARENESS IN RURAL COMMUNITIES
IN INDONESIA AND CAMBODIA THROUGH NON-FORMAL EDUCATION**

A. V. Dahlan, U. Sovannara, T. Tanaka*, K. Ikeya (Tokyo Institute of Technology, Japan)

*Email: tanaka.t.bj@m.titech.ac.jp

Lack of adequate sanitation costs Indonesia and Cambodia to the equivalent of 2.3% and 7.2% of GDP respectively [The World Bank (2017)]. Improved sanitation leads to lower disease burden, improved quality of life, increased job opportunities, and economic and social gains to society more broadly. We focused on daily sanitation, specifically on hand washing and teeth brushing. We aim the improvement of the sanitation awareness through non-formal education such as direct engagement and online platform. Our uniqueness is using technology for not only to inform them of the importance and method of sanitation but also to monitor the continuation of the efforts.

Keywords: sanitation, rural communities, education, direct engagement, online platform



DEVELOPING THE LOW COST AND EASY DIAGNOSIS TECHNOLOGY

H. Okuyama*, Y. Liu, K. kato, J. Kataoka (Tokyo Institute of Technology, Tokyo, Japan)

*Email: okuyama.h.ae@m.titech.ac.jp

Nowadays medical technologies support our healthier life. In the medical field, medical diagnosis is usually carried out at first, and then applied medical treatment according to the illness. Hence the diagnose step is important. Nevertheless, this diagnosis is not provided equally all over the world because of its cost. For example, ELISA, commonly used for diseases detections has issue of expensive cost [Esther S. Oh, et. al. (2011)]. So, poor people lose the opportunity to take a diagnosis. Therefore, our purpose is to suggest novel sensing system with features such as low cost, rapid detection, simple process, and high sensitivity.

Keywords: Medical technology, Diagnosis, Novel sensing system

SOLUTION FOR THE FOOD SHORTAGE WITH BY IMPROVING THE SOIL IN AFRICA

T. Misawa, T.Takemura, S.Shiotani, I.Min* (Tokyo Institute of Technology, Tokyo, Japan)

*Email: min.i.aa@m.titech.ac.jp

In the world more than 70 million of people is undernourished. Especially in Africa, many people are suffering from food shortage. According to Herrero [M. Herrero, et al (2017)], the world's wealthiest countries promised to invest U.S.\$20 billion to improve global food security. However, self-sufficient in food in Africa is still a problem. Because of their land is not match to produce crops. The soil cannot contain water long enough for farm plant. So, we thought we can solve the problem by using a polymer for extending the water content in soil. We will discuss about materials, plants, and cost.

Keywords: Africa, food, polymer, self-sufficiency

A STUDY OF NATIONAL INSURANCE SYSTEM AND IMPACT OF INEQUALITY

T. Sadasue, S. Maruyama, Jourenko, K. Matsuura, R. Chang
(Tokyo Institute of Technology, Tokyo, Japan)

*Email: sadasue.t.aa@m.titech.ac.jp

Recently, Inequality in both developing and developed countries impacts people's health. In many countries, medical care cost is getting higher and many people can't take enough medical services, because poverty became a big problem. We investigated some country's insurance system especially their history, their values, stakeholders and change of the system and we compared with each of them. Based on result of the investigation and comparison, we make proposal to make better the insurance system for all people.

Keywords: Insurance system, Poverty, Inequality

WORK-LIFE THERAPY BALANCE

Y. Izumoto, N. Takeshita*, S. Nishida, S. Yoneoka (Tokyo Institute of Technology, Tokyo, Japan)

*Email: takeshita.n.aa@m.titech.ac.jp

In our study, we focused on the poverty of diversity. Maintaining a healthy state while working is important for one's quality of life. The WHO says, "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." During their lifetimes, people study and work, but they also may get sick and not be able to work as usual. The poverty of understanding such diversity of life makes it difficult to maintain social health. In this work, we argue that accepting such social diversity is important for maintaining social health.

Keywords: quality of life, social health, lifetime shift, diversity

COUNSELING AI SAYS GOOD-BYE TO YOUR MENTAL ILLNESS

Lei Dong, Chen Peng, Tetsuya Kimata, Nobukatsu Hojo*
(Tokyo Institute of Technology, Tokyo, Japan)

*Email: hojo.n.ac@m.titech.ac.jp

This work proposes an artificial intelligence (AI) system for improving mental health. Usual ways to cure depression is medical counseling by human doctors or counselors. These are not convenient because of the high cost and the consultation time limitation. The conventional AI-based counseling system, Woebot [K. K. Fitzpatrick et. al. (2017)] is expected to be more convenient because the system is available anytime, anywhere. Although users can chat with Woebot and get diagnosis of mental health, support from people around them is not available. We propose a system that can get help of people around users and discuss its effectiveness.

Keywords: Mental Health, Artificial Intelligence, Counseling System

HEALTH INSURANCE POLICY: INDIA, INDONESIA AND JAPAN

T. Miyano*, S. Watanabe, T. S. Safril, S. Sharma, S. shiba
(Tokyo Institute of Technology, Tokyo, Japan)

*Email: miyano.t.aa@m.titech.ac.jp

A health insurance system is one of effective approaches to solve poverty issues in the world. However, there are some differences in health insurance conditions through the mutual learning in the case of Indonesia, India and Japan. Especially, the mutual learning regarding governmental policies, which provides us with the existing problems in health insurance system. Government-wise tax reform policies etc. were suggested via the quantitative and qualitative analyses for the betterment of the national health insurance system.

Keywords: Health insurance, Governmental policy, Tax

DEPRESSION INDEX DETECTING TO CONNECT CLINICALLY DEPRESSED PATIENTS TO MEDICAL TREATMENT

M. Murayama*, K. Kuwagaki, Y. Yamazaki, W. Hao (Tokyo Institute of Technology, Tokyo, Japan)

*Email: murayama.masamichi@torus.nr.titech.ac.jp

We focus on the method of detecting mildly depressed doctor students. In the long time of studying, they tend to feel the pressure of achievement, anxiety of future, and loneliness, and those will cause serious depression. Medical doctors can propose many kinds of treatments. However, most of students cannot aware being depressed due to the poor detecting method such as questionnaire. We propose the Depression Index (DI), represents a depression level, by collecting data i.e. quality of sleep, mental status, physical symptom, etc. Our method will cure potential depression and therefore, doctor students' mental poverty will be improved.

Keywords: depression, detecting, Depression Index

