香港中文大學
The Chinese University of Hong Kong

EMedic Global 2016 (Appendix)

List of Finalist Teams and Project Summary

	Institution	Team Members	Topic	Summary
1	University of British Columbia	Mr. Peter Alexander HADDAD Ms. Elnaz HOSSEINI Ms. Esra ALHABSHI Ms. Grace SU Faculty Advisor: Prof. Frank KO Dr. Amir SERVATI Prof. Peyman SERVATI Dr. Saeid SOLTANIAN	Flexible Wearable System for Electrodermal Activity Monitoring	• Flexible and wearable sensors are being researched extensively in order to design and develop comfortable, safe and effective monitoring devices for clinical and home settings. • Electrodermal activity (EDA) sensors are used to measure skin conductance which is strongly dependent on sweat with relations to the human nervous system responses. • A major gap in current research is the lack of a long-term wearable EDA monitoring device that is comfortable and effective with spatial information.
2	Tsinghua University	Mr. Yihao CHEN Ms. Ziyu MENG Ms. Mianzhi YANG Faculty Advisor: Prof. Xue FENG	Epidermal Nanosensor for Mosquito Sensing and Mosquito-carried Virus Specific Detection	Here the team reports an epidermal nanosensor that can detect the mosquito's approaching for early alarm and identify mosquitos with malaria plasmodium to prevent and diagnose malaria as soon as possible
3	The Chinese University of Hong Kong	Mr. Baiyan JIANG Mr. Xiaokun TANG Ms. Shiyue LIU Mr. Yifei YAO Mr. ChunHo CHEUNG Mr. Hongbin SUN Mr. Jasper WONG Faculty Advisor: Prof. Arthur Fuk-Tat MAK	VibroSAC—A Smart Active Cushion with Intermittent Vibration for Lower Risk of Buttock Pressure Ulcers	People with spinal cord injury (SCI) and frail elderly confined to wheelchairs are vulnerable to pressure ulcers. The team designed VibroSAC, a smart active cushion, that could provide a cost-effective alternative to lower the risk of pressure ulcers based on the sigmoidal tissue damage threshold and intermittent vibration.
4	The Chinese University of	Mr. HoLam HEUNG Mr. TianLe PAN	A Soft Earthworm-like Robot Targeted for GI Tract	In this project, the team presents a soft earthworm robot aiming for gastrointestinal tract inspection. It is named the

	Hong Kong (Bronze Award, Most Innovative Award)	Mr. Zhuoli ZHUANG Ms. Zhiyao MA Faculty Advisor: Prof. Zheng LI	Inspection	GISoftBot. The robot contains two inflating actuators and one extending actuator with bending function added. This allows the robot to crawl through tubular environment with sharp bends, such as colon. Pressure inside actuators are detected in real time as well, which not only enables the robot crawling autonomously, but serves as an indicator whether the robot is in well condition during operation.
5	The Chinese University of Hong Kong	Mr. Ningqi LUO Ms. Jing LIU Mr. Peng SU Mr. Guodong ZHOU Mr. Liyuan LU Ms. Yuehan CHEN Ms. Wenxuan DAI Mr. Hongbin SUN Mr. Zhiqiang ZHOU Faculty Advisor: Prof. Ni ZHAO	Multimodality Sensor System for Cuffless Blood Pressure Monitoring	N/A
6	The Chinese University of Hong Kong	Mr. Kai Fung CHAN Mr. Jiangfan YU Mr. Wai Shing LIU Mr. Edwin YU Faculty Advisor: Prof. Li ZHANG Prof. Wei WANG	Nanorobotic Swarm for Active Targeted Therapy	To realize the idea of a “swallowable surgeon”, wireless actuation of micro/nanorobots plays an important role in locomotion and part of functionalization. Magnetic field and ultrasound are safe and used extensively in clinical practice. The team has demonstrated using magnetic field and ultrasound to manipulate nanoparticles. By using this innovative method, potential applications like active targeted drug/cell delivery can be realized. This can minimize side-effects and maximize therapeutic efficiency. Delivery to unreachable region of traditional delivery is also possible.
7	The Chinese University of Hong Kong (Gold Award, Technical Challenge Award, Best Hong Kong Team)	Mr. Ka Chun LAU Ms. Esther Yun Yee LEUNG Ms. Elaine Hon Lam SIU Mr. Rico Rui Kai ZHANG Ms. Ruo Xi YU Mr. Billy Hin Kwong LEUNG Ms. Ya Li ZHENG	A Surgical Robotic System for Endoscopic Submucosal Dissection	Endoscopic Submucosal Dissection surgical robot with 2 arms: - Each arm constitutes a continuum section with 2-DoF to provide triangulation and basic movements - Each arm supports an end-effector for lifting and dissecting action, respectively Market value - for patients: less blood loss, better preserve of physical

		Faculty Advisor: Prof. Carmen Chung Yan POON Prof. Yeung YAM		function, shorter hospital stay - for clinical: shorter training time of surgeons, reduce risk of medical malpractice
8	The Hong Kong Polytechnic University	Ms. Chingyi NAM Mr. Kinming CHAN Mr. Ziqi GUO Ms. Kamling WONG Mr. Yunong XIE Mr. Waiming LI Mr. Wei RONG Mr. Jiancong WONG Faculty Advisor: Prof. Xiaoling HU	Leap Motion-Based Upper Limb Rehabilitation & Evaluation System	In this study, a Leap Motion based upper limb rehabilitation and evaluation system was designed. The Leap Motion can support the bilateral upper limb training by incorporating it with robotic arms; it can be used as an independent training device for hand rehabilitation; it can act as an evaluation device for multi-joint assessments of fingers functionality.
9	The University of Hong Kong	Mr. Enoch Jing-han CHANG Ms. Abigail Dee CHEN Ms. Jessica Evangeline Tan KABIGTING Faculty Advisor: Prof. Wei-Ning LEE	CapQi	N/A
10	The Hong Kong University of Science and Technology	Mr. Cheuk Ho YUEN Ms. Man Ching KO Mr. Shih Lung TAM Faculty Advisor: Prof. Betty LIN	Bonnect - A Smart Infant Diet Tracking and Advisroy System	Bonnect offers an Internet-of-Things solution to keep an automatic and accurate baby log. It consists of a smart infant diet tracker, an app and a cloud infrastructure. It helps general parents to understand their babies' daily diet habits and to share information with caretakers and medical professionals. At the same time, Bonnect's predictive analyze better assist doctor to judge medical urgency and diagnose regarding to the appearance of disease and allergy symptoms.
11	The Hong Kong University of Science and Technology	Ms. Melody, Jin Teng CHUNG Ms. Nadiya Aisha YUDIANA	DDX - Drug Dispensary Box	THE NGO One-2-One Medical Outreach Team in Phnom Penh, Cambodia runs a mobile clinic which provides free medical health care weekly in the harsh conditions of the slums.

		Advisor: Mr. Chung Yan YU		The team designs a drug carrier that can reduce the time taken for the mobile pharmacy setup, so that more patients can be served. Examples of results includes: Pharmacy station setup time is reduced from 30 minutes to 3 minutes (90% reduction); Less manpower is needed to setup and man the pharmacy station; One-2-One can allocate its team members on other stations and serve more patients.
12	The Hong Kong University of Science and Technology	Mr. Kevin Ms. Wing Yu LEE Ms. Sandra Anna SOBANSKA Faculty Advisor: Prof. Ying CHAU	Electronic Medical Records System (EMRS)	1. EMRS has been introduced into Cambodian Canal Side slum in June 2015 and its database currently holds over 200 patients. After successful implementation, EMRS has been extended into the Phnom Penh Family Medical Clinic, where patients can sign up for subsidized cleft surgeries performed by visiting specialists from abroad. Web portal access to the clinic database enables these doctors to familiarize themselves with the patient history prior to the visit as well as monitor the post-surgery results online. 2. With fingerprint identification, the retrieval time of patient history was reduced from an average of 3 minutes to 15 seconds. 3. The time spent per patient for registration in triage was reduced from an average of 5 to 3 minutes. This number is expected to continuously decrease as staff's familiarity increases. 4. Dr. Annie Chen-Green, the founder of NGO One-2-One is now able to monitor the performance of her staff remotely through the web portal during her commitments outside Cambodia.
13	King Saud University	Mr. Bilel BEN JDIRA Mr. Suliman ABAALKHIL Mr. Mohammed AL-RASHDAN Mr. Mohammed AL-YAHYA Faculty Advisor: Dr. Naif ALAJLAN Dr. Haikel HICHRI Dr. Yakoub BAZI	BlindSyss-An Innovative Wearable System for Helping Blind People Move and Sense in Indoor Environments	N/A
14	National	Mr. Joo Chuan YEO	ThumbSense - A Wearable	The team developed a highly sensitive wearable thumb

	University of Singapore	Mr. Zhao Ming KOH Faculty Advisor: Prof. Chwee Teck LIM	Thumb Orthotic for Real-time Force and Motion Sensing	orthotic that is able to distinguish different pressing forces and finger motion. The device is soft, flexible, stretchable, deformable, yet robust and capable of withstanding large mechanical loads. Finger dynamics may be measured real-time and sent to clinicians or users as part of diagnosis, monitoring and prevention.
15	National University of Singapore (Silver Award)	Mr. Hong Kai YAP Mr. Benjamin Wee Keong ANG Faculty Advisor: Prof. Raye Chen-Hua YEOW	EsoGlove: A Soft and Wearable Robotic Glove for Assistance and Rehabilitation of Hand-Impaired Patients	EsoGlove is a soft and wearable glove that provides assistance to hand movements during activities of daily living (ADL) and rehabilitation for hand-impaired patients. Conventional solutions are bulky and consist of rigid components that are uncomfortable for patients. Based on their patented soft robotic technology, EsoGlove is designed to be flexible and lightweight. It is at least 3x lighter than current rehabilitation device, and able to provide more at-home rehabilitation therapy time, which leads to faster recovery.
16	National University of Singapore (Bronze Award)	Mr. Thoriq SALAFI Mr. Shi Xiong CHEW Mr. Guang Rong TAN Mr. Jia Wei Garrett CHONG Faculty Advisor: Prof. Yong ZHANG	Microdevice for Bacterial Infection Detection based on Deterministic Lateral Displacement	N/A
17	National University of Singapore (Bronze Award)	Mr. Shihao LI Mr. Duffin THORIN Ms. Rongxuan ZHUANG Ms. Shuhui YUAN Faculty Advisor: Prof. Dieter W. TRAU	BiliOptics	The team is aiming to develop a Low-cost, Point of care Neonatal Jaundice Screening Device, specifically designed for developing countries like Myanmar, Zambia and Kenya, to protect newborns in the most vulnerable hours and meanwhile improve the current technology of Non-invasive Jaundice-meters.
18	Yonsei University	Mr. Seongjung KIM Mr. Hansoo LEE Mr. Soonjae AHN	Sign Language Recognition Using EMG and IMU Sensors	Study objectives 1) To determine various hand gestures for sign language

		Mr. Jongman KIM Faculty Advisor: Prof. Youngho KIM		recognition in real-time using armband type EMG and IMU sensors 2) To determine the reliable number of training samples for gesture classification accuracy over 95%
19	Yonsei University	Mr. Chongmyeong LEE Mr. Hyeonho HAN Mr. Byounghan JANG Faculty Advisor: Prof. Jaehong KEY	Nanoparticle Inducing Device for efficient cancer treatment by using magnetic nanoparticle	Cancer is a major public health problem in the United States and many other parts of the world. Current medicine treats cancer by using chemotherapy, radiation therapy, and surgery. However, these methods have severe side effects and high risk of recurrence. Nanoparticle therapeutics will be a promising method to treat cancer more effectively minimizing side effects, but current targeting rate of nanoparticles is very low mostly less than 10% injection dose. In this study, the team suggests a novel nanoparticle inducing device (NID) which increases the targeting rate of nanoparticles and potentially it can be utilized to treat cancer.
20	Yonsei University	Mr. Hyunjun JUNG Ms. Juyeon GIM Mr. Taegyu PARK Faculty Advisor: Prof. Byongjin CHO	Bilateral Training System for Hemiparesis Rehabilitation	By using flex sensors mounted on the glove, the device detects flexion-extension movement of fingers. Entering data can be recorded and transmitted to a computer and the robotic hand respectively for monitoring and bilateral training. The major aim of this project is to enable long-term hand recovery activities at home for patients who cannot access medical institutions. Motor recovery can be facilitated using bilateral training at early rehabilitation and maintained with long-term exercise playing the training game. With this product, patient care would be easier and users can examine recovery progress and engagement themselves.
21	ETH Zurich (Silver Award)	Mr. Daniel LEHMANN Mr. Samuel RUCKSTUHL Mr. Roel PIETERS Ms. Franziska ULLRICH	Assistive System for Intravitreal Therapy	This project aims at the development and commercialization of a novel system for automated intravitreal injections. It allows for a fully automated injection that is initiated via a computer and monitored by a remote ophthalmic surgeon via a visual-auditory communication system.

		Faculty Advisor: Prof. Bradley J. NELSON		The injection needle is guided through software, including eye-tracking and iris recognition. Precision and safety are fundamental to the system design and do not depend on the manual dexterity of medical staff using a hand-held system.
22	National Cheng Kung University (Bronze Award, Best Presentation Award)	Ms. Hsiu-Kang HUANG Ms. Wen-Ling LIAO Ms. Chien-Yu LIN Mr. Tzu-Yang CHEN Mr. Ting-Yu SU Faculty Advisor: Prof. Che-Wei LIN Prof. Tak-Wah WONG	Thermo-Tech Shoes	Thermo-Tech Shoes have powerful functions to provide solutions for four main challenges of diabetic patients: - Improve blood circulation by delivering heat and far infrared ray; - Inhibit bacterial growth by lowering foot temperature; - Warn the patients in time to avoid infection; - Monitor abnormal pressure and gait to evaluate the danger score automatically.
23	University of Strathclyde	Mr. Richard COPELAND Ms. Robin RACKERBY Ms. Laura UNDERHILL Ms. Zoe TANKARD Faculty Advisor: Dr. Philip RICHES Dr. Arjan BUIS	Design and Development of a High Performance Prosthetic Foot for Low Income Countries	In the developing world there are ~1-2 amputees per 1000 people. An amputation can cause significant financial strains and social exclusion. The anatomical foot provides shock absorption and energy return ;this needs to be recreated in the prosthetic foot. The Strathclyde Foot is a dynamic, inexpensive foot for the developing world with a durable, cosmetic rubber casing.
24	Binghamton University (SUNY) (Bronze Award)	Ms. Amanda LAU Ms. Sophia FU Ms. Alise Hiu Ching AU Mr. Steven MITCHELL Mr. Jason Yumin WU Mr. Nathaniel FISHER Mr. Bar STERN Mr. Ylli DEMA Faculty Advisor: Prof. Kenneth MCLEOD Dr. Guy GERMAN	Tre-no-mor	Resting tremors complicate Parkinson's patients' daily activities, making tasks such as eating, drinking, writing, and putting on clothes and makeup hard to do. Design of the team is a cost effective physical therapy device which uses mechanical force to cancel out a patient's tremors. This product has potential to bring new levels of treatment to developing countries and greatly increases quality of life.
25	Stony Brook	Ms. Belinda TANG	ProperGait	ProperGait is a wearable fall detection device geared

	University (SUNY)	Ms. Amna HAIDER Mr. Bruce COLUCCIO Mr. Jian LIAO Mr. Alan KAO Mr. Nolan KIM Mr. Chanpreet SINGH Mr. Biprajit SAHA Ms. Ruiqi WANG Faculty Advisor: Prof. Mei Lin CHAN		towards rehabilitation therapy. Aim: Resolve abnormal gait patterns seen in stroke, elderly, and peripheral neuropathy patients, in order to prevent future life threatening falls. - The insole records pressure data over time and includes a vibrational aspect to correct gait. - The wearable fall detection device contains an absolute orientation IMU and a button to request/cancel a call for help. These components work together to create a more accurate and visual rehabilitation approach to existing devices.
26	Stony Brook University (SUNY)	Ms. Elizabeth ARANGUIZ Mr. Andrew PEITZSCH Mr. Jason MEURLIN Mr. Timucin ALTAN Mr. Vinoth Ratnayaka MUDIYANSELAGE Mr. Shamik SHAH Mr. Matthew WU Faculty Advisor: Prof. Mei Lin CHAN Dr. Joshua MILLER	Gluclip: Infrared Blood Glucometer	The objective is to design a portable glucose meter that is minimally invasive, allows for continuous monitoring, and ultimately decreases healthcare costs for diabetics
27	University of Pennsylvania	Mr. Kuk JANG Mr. Zhihao JIANG Mr. Ashwin DEWAN Mrs. Vivek MENON Faculty Advisor: Prof. Rahul MANGHARAM Dr. Marco BECCANI Dr. Houssam ABBAS	In-Silico Pre-Clinical Trials for Implantable Cardiac Devices	Approach of the project is to develop physiological and device models for simulation-based pre-clinical trials which provide insight prior to actual clinical trials. Starting with 100’s of real patient signals, the team’s approach generates 10,000’s of synthetic heart models across a range of conditions and then feeds them for closed-loop evaluation with medical devices.

Final Competition Judging Panel

- Prof. Bob NEREM (Honorary Judge), International Federation of Medical and Biological Engineering
- Prof. James GOH (Chairman) , National University of Singapore
- Dr. Andros CHAN, Hong Kong Medical & Healthcare Device Industries Association
- Prof Youngho KIM , Yonsei University
- Dr. Alan LAM
- Prof. James LAU, The Chinese University of Hong Kong
- Prof. KS LEUNG, The Chinese University of Hong Kong
- Prof. Kenneth MCLEOD, Binghamton University (SUNY)
- Prof. Vincent MOK, The Chinese University of Hong Kong
- Dr. Philip RICHES, University of Strathclyde
- Prof. Yeung YAM, The Chinese University of Hong Kong

Final Competition Judging Criteria

Clinical Impacts (25%)	Needs, Potential clinical benefits, Clinical feasibility, Business model (including regulatory issues, etc.)
Novelty (25%)	Major conceptual innovation vs incremental gain over existing products, Potential IP
Technical Merits (40%)	Technical challenges, Demonstration of technical feasibility
Presentation (10%)	Clarity, Engaging presentation

To avoid conflicts of interest, a judge will not give scores to the team(s) from his own institution.