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Wisdom of the Land

Creating an Effective Hybrid Learning for the Post-Pandemic World

Assoc. Prof. Jackrit Suthakorn, PhD

Dean of Engineering, Faculty of Engineering

Mahidol University, Thailand

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About Me

Jackrit Suthakorn, PhD



รศ.ดร.จักรกฤษณ์ ศุทธากรณ์

ตำแหน่งปัจจุบัน:

คณบดีคณะวิศวกรรมศาสตร์ มหาวิทยาลัยมหิดล

นายกสมาคมสภาคณบดีคณะวิศวกรรมศาสตร์

ประธานสภาคณบดีคณะวิศวกรรมศาสตร์แห่งประเทศไทย สมัยที่ 41 และ 44

EDUCATION:

Executive Management (2019):

MIT (Sloan)

PhD in Robotics (2003):

Johns Hopkins University

MS in Control Engineering (1998):

Michigan Tech University

B.Eng. in Mechanical Engineering (1995):

Mahidol University

INTERNATIONAL AFFILIATION:

Trustee, International RoboCup Federation

Vice President, RoboCup Asia-Pacific (RCAP)

Executive Member, Asia-Pacific Association for Biomechanics

Chair, IEEE Robotics and Automation Society - Thailand Chapter

Medical Robotics

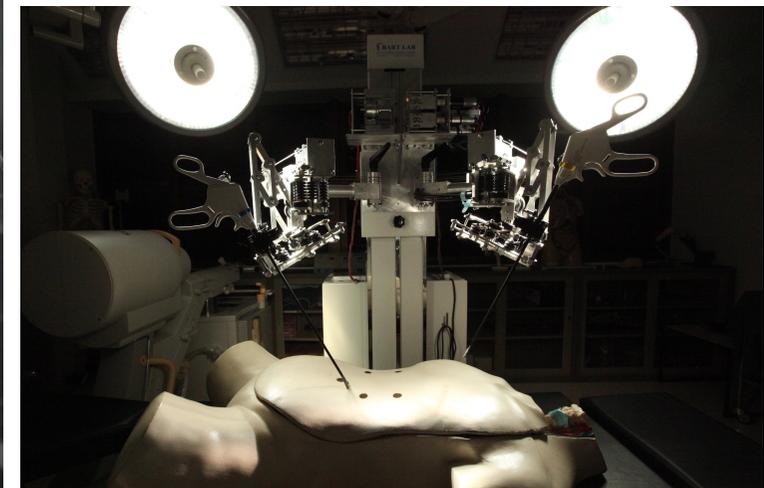
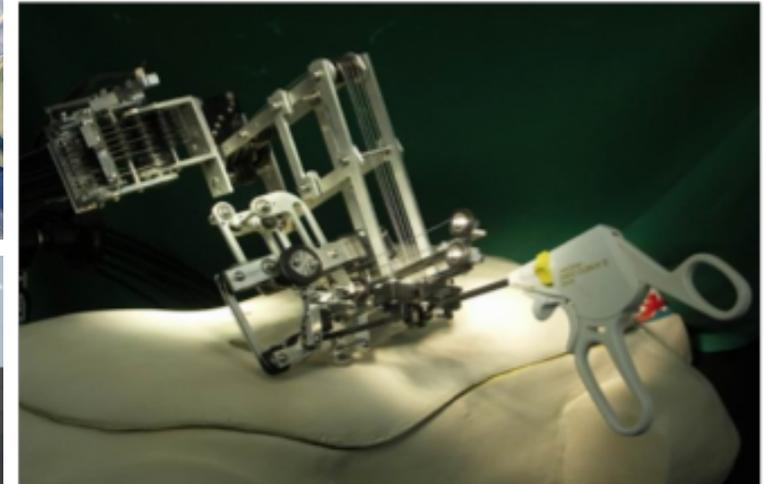
Surgical Robotics

MU-Laparobot: A Corporative Surgical Robot for Laparoscopic Surgery

Jackrit Suthakorn¹, Chumpon Wilasrussamee, MD², Chawaphol Direkwattana¹, Nantida Nillahoot¹, Saqib Hussain Shah¹, Yuttana Israchaiyos¹, Pittawat Thiutipsakul¹

¹BART LAB, Faculty of Engineering, Mahidol University,

²Department of Surgery, Faculty of Medicine Ramathibodi Hospital, Mahidol University



- Direkwattana, C., Suthakorn, J. and Wilasrussamee, “Mu-laparobot: A Corporative Surgical Robot for Laparoscopic Surgery,” *The Open Biomedical Engineering Journal*, 2020, Vol. 14(1), pp. 43-53.
- Pillai, B., M., Wilasrussamee, C., and Suthakorn, J., “Observer Based Dynamic Control Model for Bilaterally Controlled MU-Laparobot: Surgical Tool Force Limiting,” *International Journal of Electrical and Computer Engineering*, Vol. 10(1), 2020, pp. 828-839. DUGA Keynote: Jackrit Suthakorn, Mahidol University ©

Medical Robotics

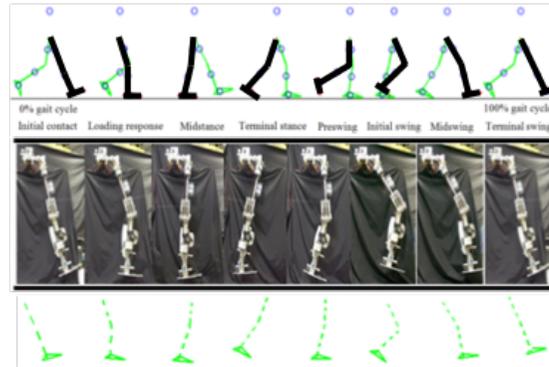
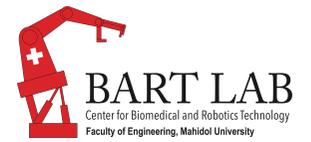
Rehabilitation Robotics

BART LAB LL-EXO 1: Design and Motion Analysis

Jackrit Suthakorn¹, Pitchaya Rayothee², Wanchan Banchadit¹, Acharaporn Temram¹,
Tassanai Sukwan¹, Peeraapat Owatchaiyapong¹

¹BART LAB, Faculty of Engineering, Mahidol University,

²Sirindhorn School of Prosthetics and Orthotics, Faculty of Medicine Siriraj Hospital, Mahidol University



- Banchadit, W., Temram, A., Sukwan, T., Owatchaiyapong, P., and Suthakorn, J., "Design and Implementation of a New Motorized-Mechanical Exoskeleton Based on CGA Patternized Control," *Proc. 2012 IEEE Int'l Conf. on Robotics and Biomimetics (ROBIO 2012)*, 2012, Guangzhou, China, pp. 1668-1673.

Medical Robotics

Hospital Service and Logistics

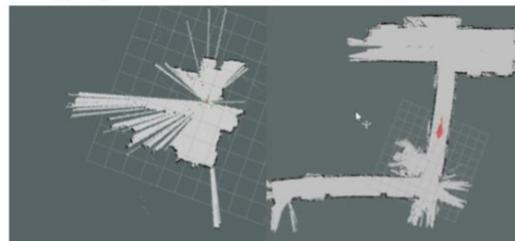
DoctoSight II: A Intelligent Mobile Tele-Medicine Robot

Jackrit Suthakorn, Korn Borvorntanalanya, Pittawat Thiuthipsakul, Choladawan Moonjaita,
BART LAB, Faculty of Engineering, Mahidol University,
Under Collaboration with Faculty of Medicine Siriraj Hospital and Faculty of Medicine Ramathibodi Hospital



- Vital Signs Transferring System
- Integrated IOT System
- Mapping & Navigation System
- Telepresence System

Mapping & Localization System



Robot Locomotion (3DOF)

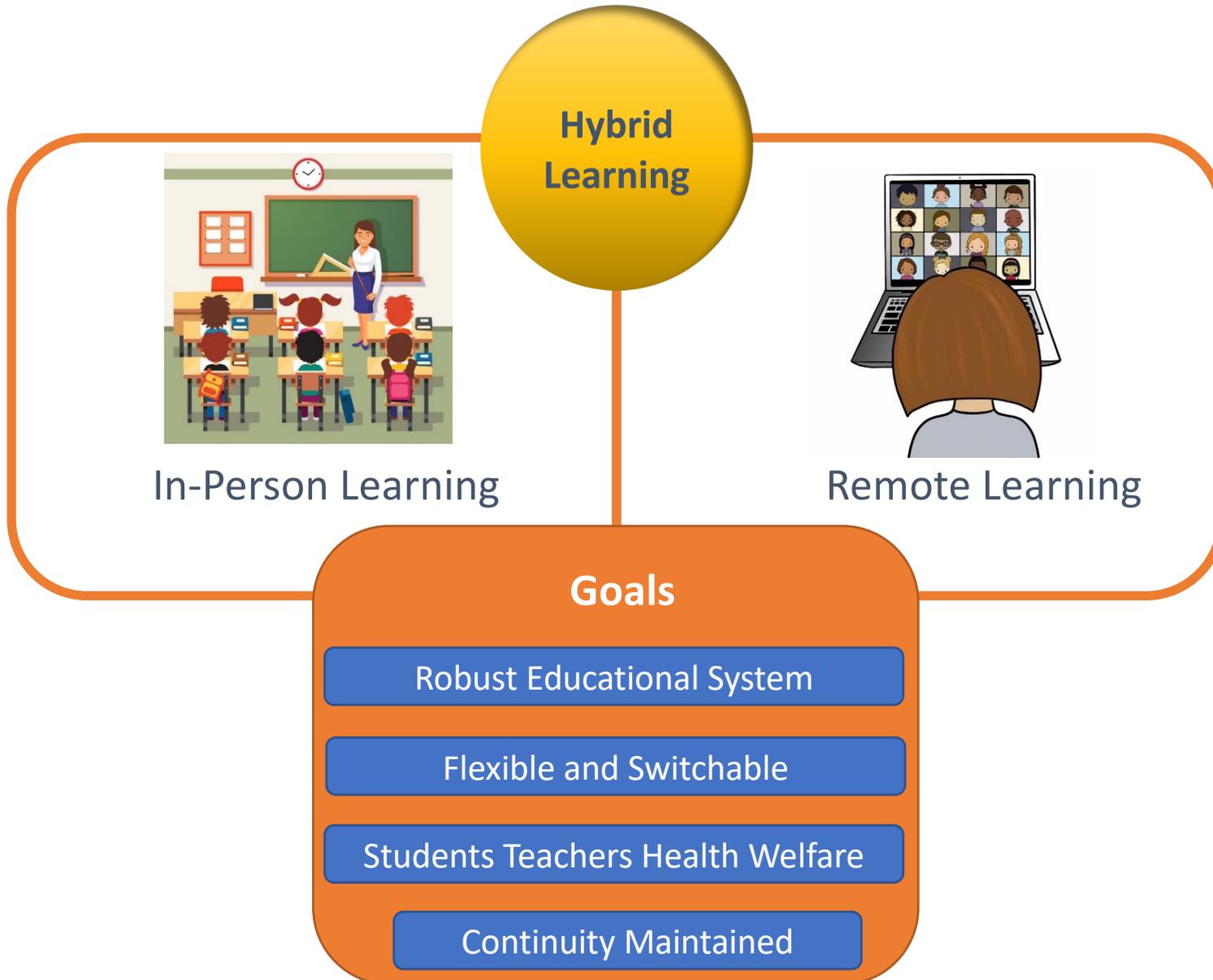




Problems	COVID-19 Scenario			
		Inconsistent Pandemic Situation	Active Vaccination in Communities	
	Virtual Education	Learning Process for some subjects difficult in Remote-learning format	Lack of appropriate resources and budget for teachers and students	Students reluctant to rejoin physical classroom post-pandemic
Solution Framework				



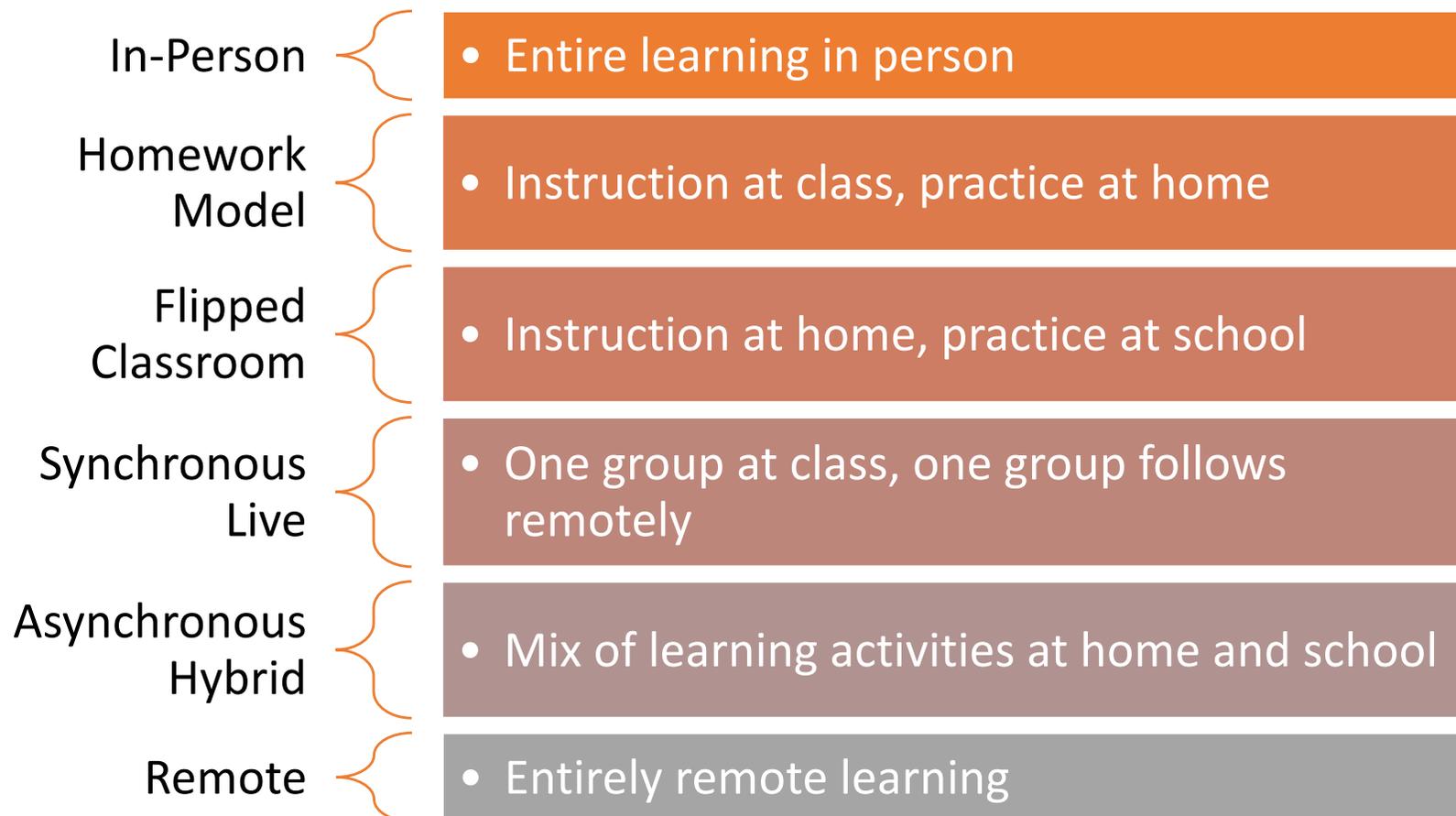
Hybrid Learning Framework

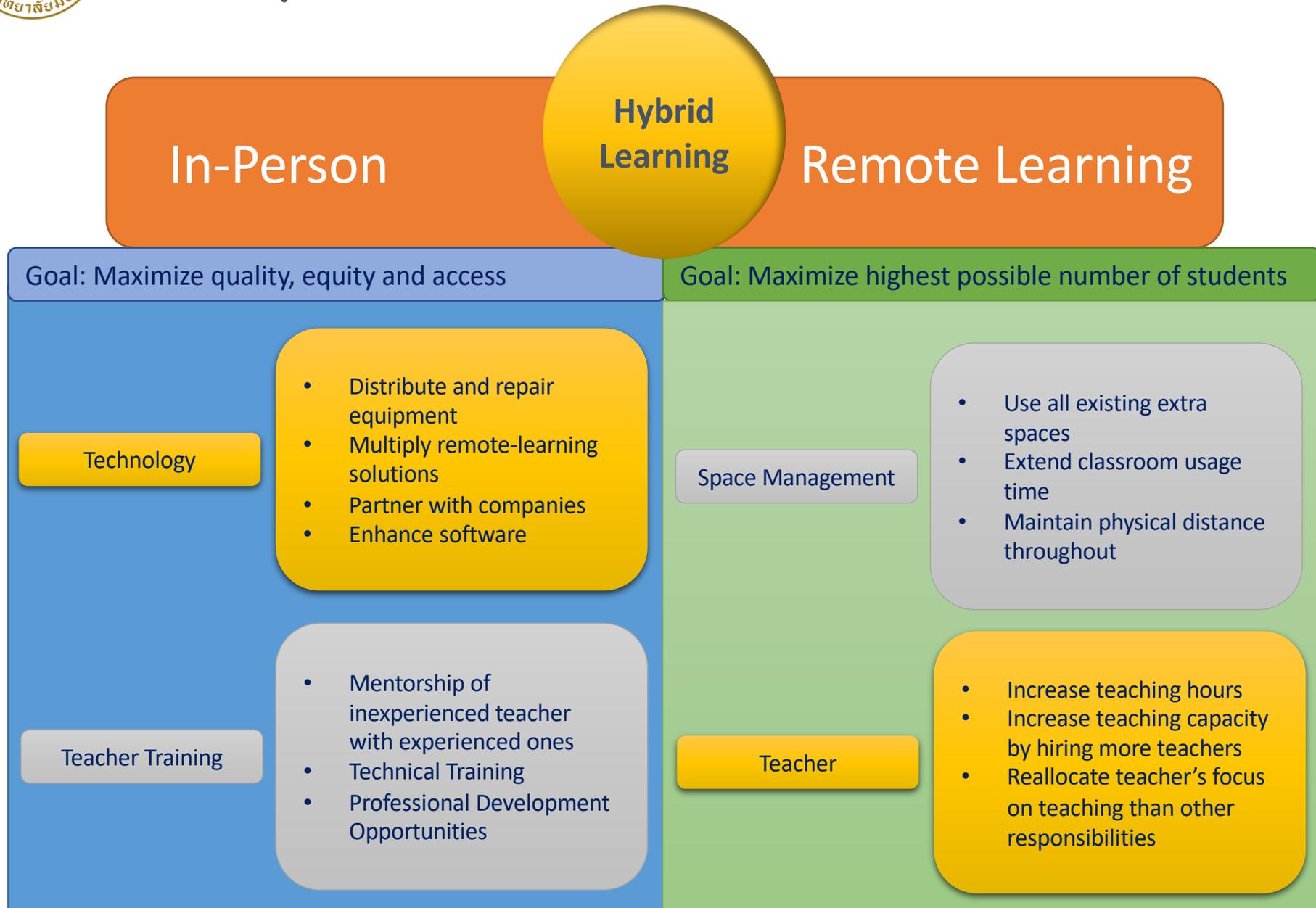




Hybrid Learning Approach

Understand	Decide and Design	Enable and Execute
<ul style="list-style-type: none">• Assess students' needs• Assess accessibility• Access teacher capacity• Assess available space• Assess facilities such as transportation, cleaning, budget, etc	<ul style="list-style-type: none">• Decide resource allocation• Prioritize students segments• Identify vulnerable groups• Define the system• Decide the increment in incoming students	<ul style="list-style-type: none">• Identify subject that can be handled remotely• Prioritize learning activity for in-person• Organize shift system• Define teacher allocation model• Fill capability gap to deliver quality
Monitor and Adjust		







Data Sources	Elements of Assessment	
Platform Statistics	<ul style="list-style-type: none">• Health Risk• Economic Activity• Students Participation• Curriculum Progress• Activities Allocation• Students Wellbeing• Satisfaction with shifts	<ul style="list-style-type: none">• Teacher experience• Remote learning capability• In-person capacity• Student engagement• Learning Outcomes• Access Distribution• Quality Distribution
Test Scores		
Healthcare Data		
Teacher Survey		
Student Survey		



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Counteractions against the Pandemic COVID-19

Mahidol University, Thailand



Countermeasures if a student infected



Facilities

Cleaning and Disinfecting the buildings and suspected places the student visited



Tracing the contact

Tracing the students who were contacted, testing and isolating the potential students



Medical Service

Isolating and providing proper medical attention to the infected student



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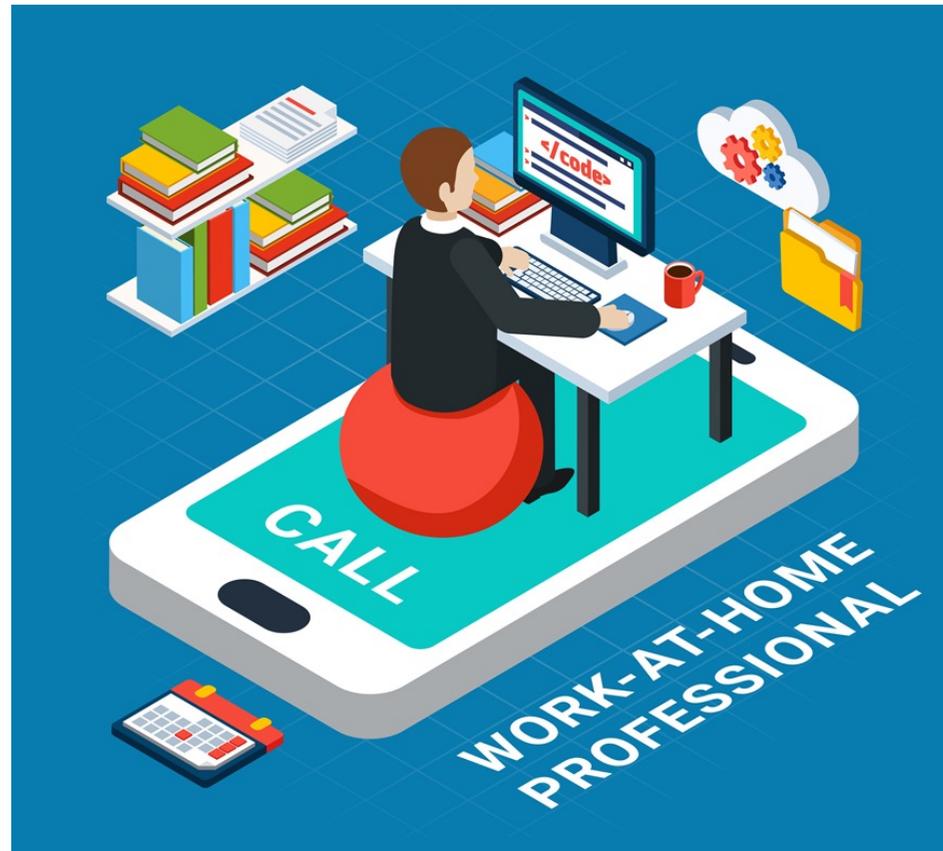
Re-opening of University

- Proper information and scientific safety measures were conveyed frequently across students and staff through spontaneous communication systems.
- Co-ordination of feedback and management of crisis were done perfectly.
- Detailed safety measures and counteractions were implemented which are explained in the following slides.



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Work from home and limited attendance of employee



Employees were allowed to work from home
In emergency cases alternative days were granted leave.



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Hybrid Classes: Mostly online, lab-work with proper measures



Online Classes for Undergraduate and Postgraduate Students

Lab works with proper measures



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Compulsory Mask and Face shields

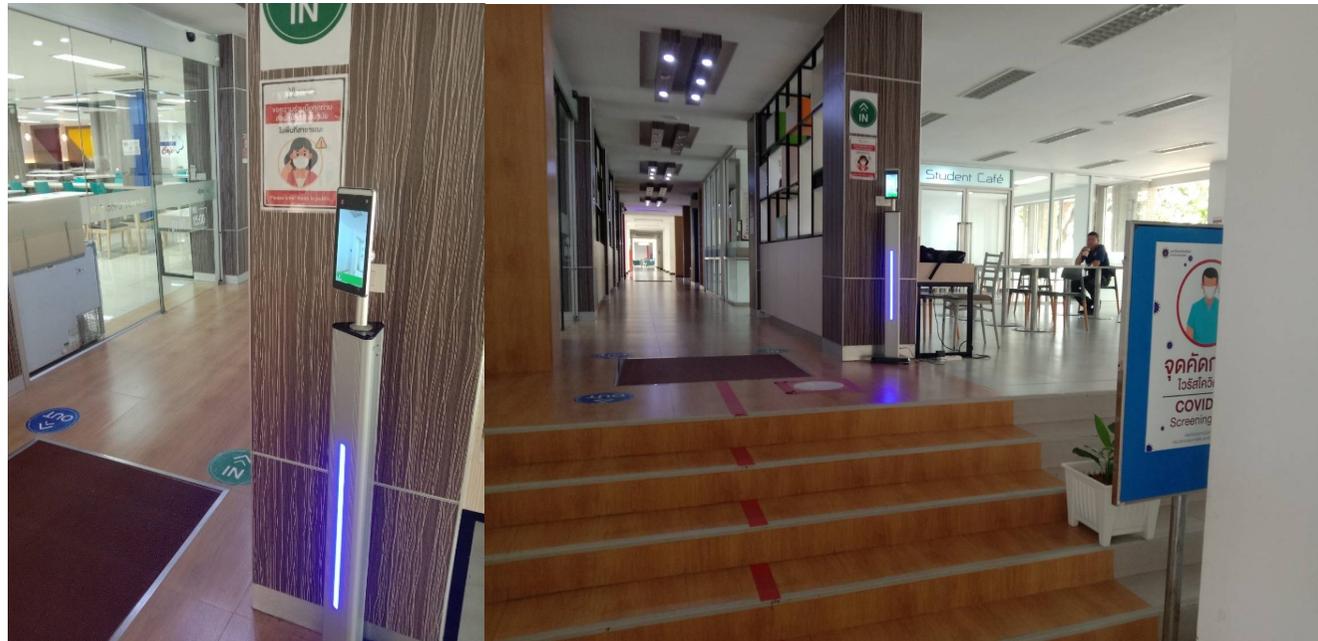


Face mask was mandatory for permitting entry to university



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Temperature Monitoring System in every building entrance

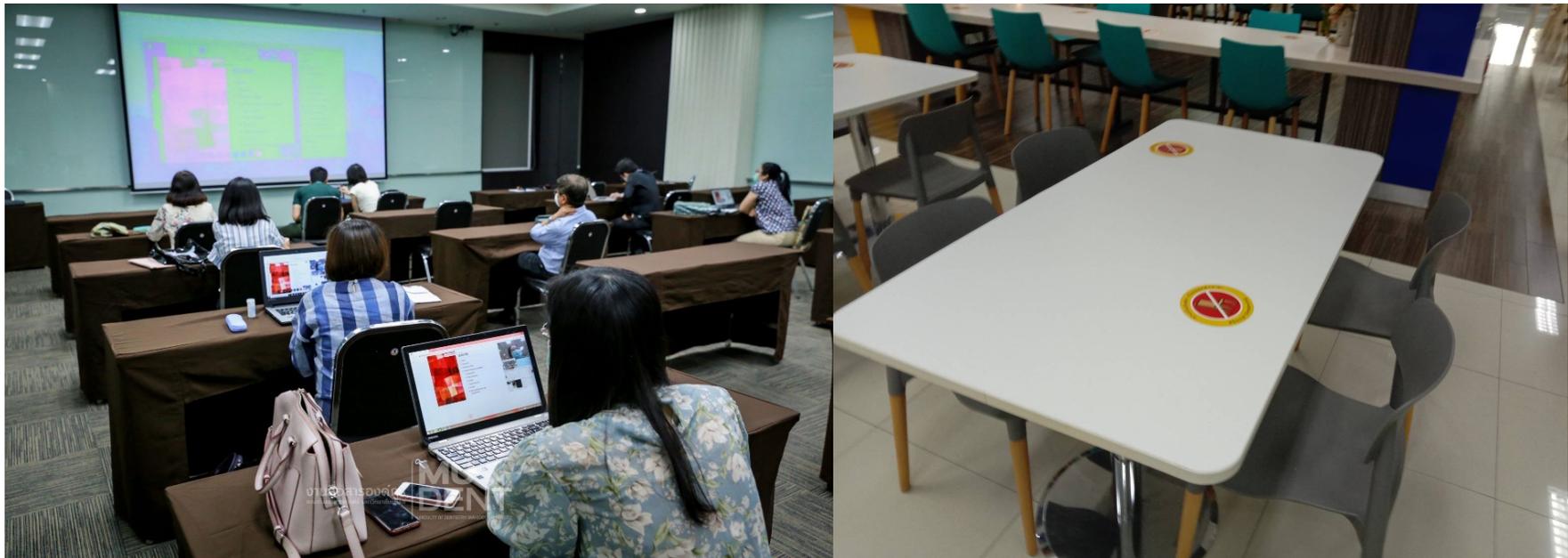


Temperature monitoring and usage of hand sanitizers were made compulsory at the entry point of each building within university



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Social Distancing and isolation inside Campus



Social distancing were strictly maintained in each and every gathering areas in university like classrooms, cafeteria etc..



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Learning Management System (LMS)

- Mindflash
- SkyPrep
- ProProfs LMS
- iSpring Learn
- TalentLMS
- Docebo
- Moodle
- Litmos
- Knowmax
- Google Classroom
- Canvas
- Edmodo
- Blackboard
- Joomla LMS
- Brightspace
- Absorb LMS
- Schoology
- eFront
- Adobe Captivate Prime LMS



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Learning Management System (LMS): google classroom

EGBE 481: Intro to Medical Robotics Class 2020
Class code: qfdgvrn

Upcoming
No work due soon

Pittawat Thiuthipsakul posted a new assignment: Class Project
Jan 26 (Edited Jan 28)

Nantida Nilahoot
Oct 15, 2020 (Edited Oct 15, 2020)
Course Syllabus (Short Version)

EGBE 481: Introduction to Medical Robotics
Department of Biomedical Engineering, Faculty of Engineering, Mahidol University
Semester 1/ 2020
Class Schedule: Thursday @1.00-4.00PM

Robotics Class Project
Due Jan 30, 11:59 PM

FWD Kinematic MATLAB
Due Oct 15, 2020, 4:00 PM

Week 1: FWD Kinematic MATLAB: Progress 1...
Due Oct 22, 2020, 4:00 PM

Week 2: FWD Kinematic MATLAB: Progress ...
Due Oct 29, 2020, 4:00 PM

Week 3: FWD Kinematic MATLAB: Progress ...
Due Nov 5, 2020, 12:00 PM

Week 4: FWD Kinematic MATLAB: Completeness 15%, Presentation 20%, Technical 20%

14 Turned in, 0 Assigned

Week 4: FWD Kinematic MATLAB: Completeness 15%, Presentation 20%, Technical 20%

14 Turned in, 0 Assigned

Student	Attachments	Status
Wisrut Ank	4 attachments	Turned in
Kanya Areeraksa	7 attachments	Turned in
Panuwat Kirdsuk	3 attachments	Turned in late
Pookan ks	4 attachments	Turned in
Jatura Likitratanaporn	5 attachments	Turned in
Rittichai Praiboon	7 attachments	Turned in
nat S.	4 attachments	Turned in
Phuthinan Saengkitanom	4 attachments	Turned in
Tanyawat Samakit	4 attachments	Turned in
Th Sat	3 attachments	Turned in
nat S.	4 attachments	Turned in

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Files

- 4EE1F46-5A0B-432...
- ABBYUML.mlapp
- Forward Kinematics.pdf
- Forward Kinematics.pptx
- MATLAB App 2563-11-04 21...
- MATLAB App 2563-11-04 21...
- MATLAB App 2563-11-04 21...

Grade: /55



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Research and Development of Countermeasures



Telemedicine and communication social robot



Negative Pressure Casualty Bag



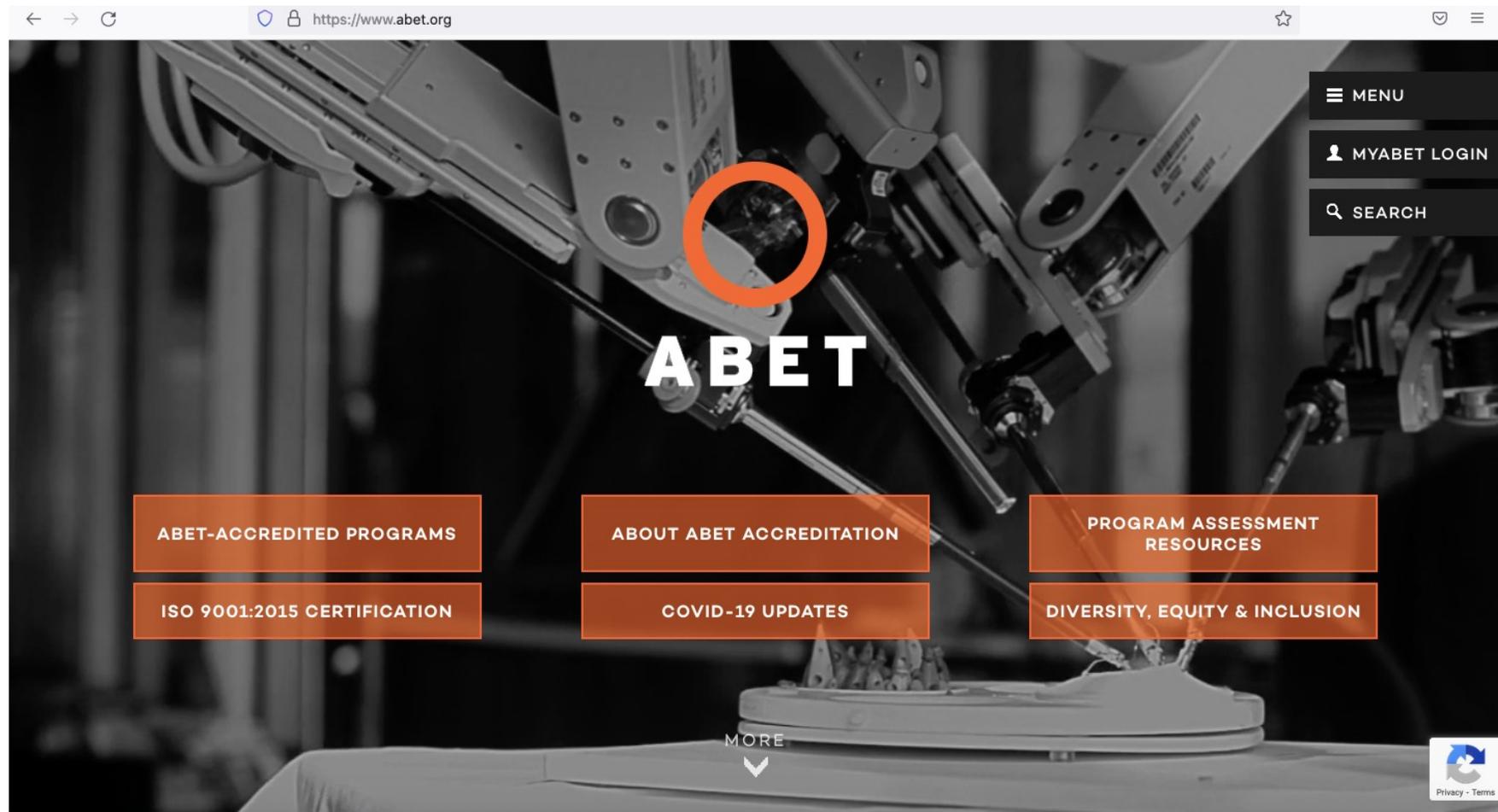
Actuated face-shield for Graduation Ceremony



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- ABET Accreditation -
The Accreditation Board for Engineering and Technology



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Accreditation Adds Value to “Global”

- ABET accreditation assures confidence that a collegiate program has met standards essential to prepare graduates to enter critical STEM fields in the global workforce.
- Graduates from an ABET-accredited program are capable of leading the way in:
 - innovation, emerging technologies, and
 - in anticipating the welfare and safety needs of the public.
- ABET accreditation:
 - Ensures that graduates have met the educational requirements necessary to enter the profession.
 - Provides opportunities for the industry to guide the educational process to reflect current and future needs.
 - Enhances the mobility of professionals.

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Accreditation Adds Value to “Institutions”

ABET accreditation tells your prospective students, peers and the professions you serve that your program:

- Has received international recognition of its quality.
- Promotes “best practices” in education.
- Directly involves faculty and staff in self-assessment and continuous quality improvement processes.
- Is based on “learning outcomes,” rather than “teaching inputs.”
- Can more easily determine the acceptability of transfer credits.

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Accreditation Adds Value to “Students”

- Verifies that your educational experience **meets the global standard** for technical education in your profession.
- Enhances your **employment opportunities**—multinational corporations require graduation from an accredited program.
- Supports your entry to a **technical profession** through [licensure, registration and certification](#)—all of which often require graduation from an ABET-accredited program as a minimum qualification.
- Paves the way for you to work globally, because ABET accreditation is **recognized worldwide** through international agreements, and many other countries’ national accrediting systems are based on the ABET model.

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Mahidol University
Faculty of Engineering

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Thank you