醫學領域的人工智能(AI)、机械人(R)

ARTIFICIAL INTELLIGENCE AND ROBOT (AIR) IN MEDICINE

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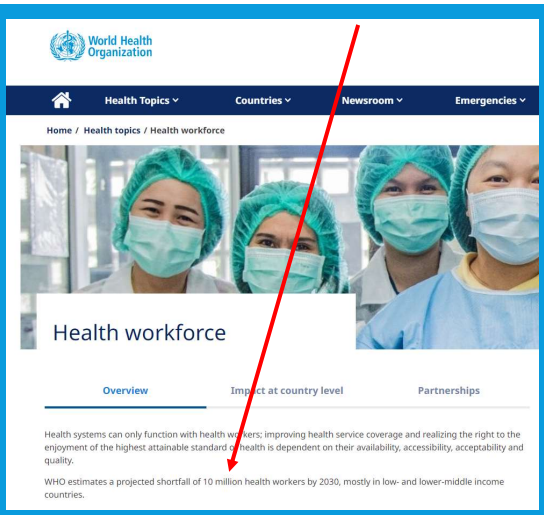
SHORTAGE OF HEALTHCARE WORKERS
医护人员短缺

Globally Shortfall of 10 million health workers by 2030



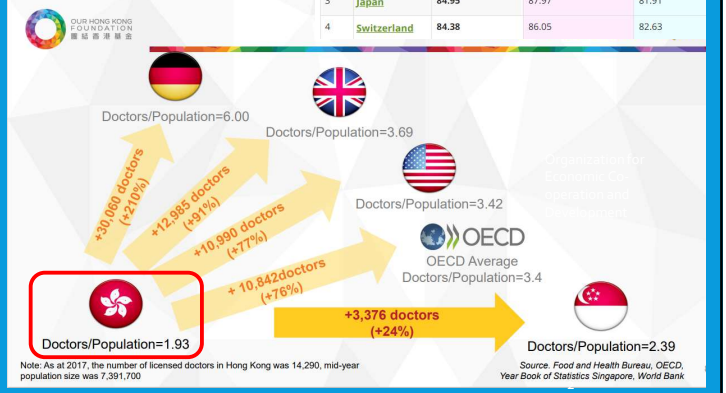
Contributor is Technology

Countries ranked by life expectancy (2023)

(click on a country for more details)

Search:

#	Country	Life Expectancy (both sexes)	Females Life Expectancy	Males Life Expectancy
1	Hong Kong	85.83	88.66	83.00
2	Macao	85.51	88.11	82.88
3	Japan	84.95	87.97	81.91
4	Switzerland	84.38	86.05	82.63



Note: As at 2017, the number of licensed doctors in Hong Kong was 14,290, mid-year population size was 7,391,700

Source. Food and Health Bureau, OECD, Year Book of Statistics Singapore, World Bank

ARTIFICIAL INTELLIGENCE AND REFORMINGS (AIR) IN MEDICAL TECHNOLOGY
人工智能在经络穴位诊断,手术机械人,和医疗培训

- **AI-transforming traditional meridian-acupoint Diagnostics into modern medicine**

人工智能将传统经络穴位诊断转化为现代医学

- **Reforming robotic operation into high-precision surgery**

将机械人手术改造为高精度手术

- **Reforming traditional medical training into "See Many, Do Many, Teaching Many" style**

将传统医学培训改革为"看很多、做很多、教很多"模式

ARTIFICIAL INTELLIGENT MERIDIAN ACUPOINT DIAGNOSTICS
人工智能经络穴位诊断

- Traditional Chinese Medicine (TCM) stands tall as an ancient medical practice, tracing back more than 3,800 years.

中医是一门古老的医疗方法，已有 3,800 多年的历史。

- Acupoint tenderness diagnostics is a diagnostic method that identifies diseases by pressing the patient's acupoints and judging whether the acupoints have tenderness reactions.

穴位压痛诊断是通过按压患者的穴位，判断穴位是否有压痛反应来识别疾病的诊断方法。

- The method can be found scattered in ancient Chinese medical works but has not been formed as a systematic subject all along.

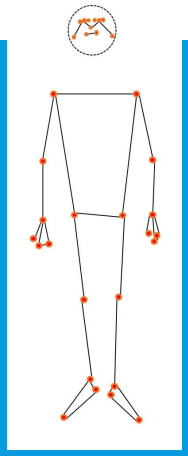
该方法在中国古代医学著作中零星出现，但一直没有形成系统的学科。

- Artificial Intelligent (AI) Meridian Acupoint Diagnostics is developed.

开发了人工智能（AI）经络穴位诊断技术。

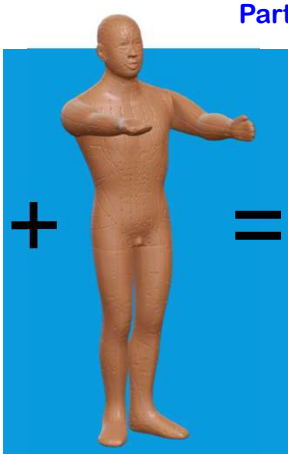
ARTIFICIAL INTELLIGENT MERIDIAN ACUPOINT DIAGNOSTICS
人工智能经络穴位诊断

Partnership with Chinese medicine hospital for Clinical trial



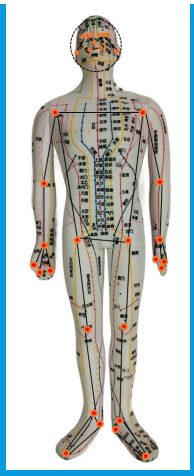
AI pose landmark model

+



3D Scanning Acupuncture Model

=



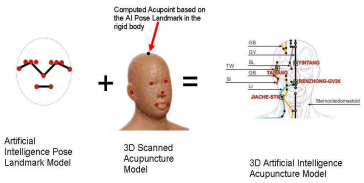
3D AI Acupuncture Mode!

QUALITY CONTROL 质量控制

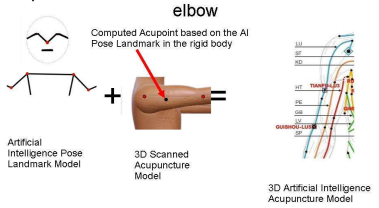
1. **Acupuncture point obtained from TCM textbook** 取自中医教科书的穴位
2. **Verification by Chinese Medicine Practitioners (CMP) & Professors from HK Museum of Medical Sciences (HKMMS)**经中医师及香港医学博物馆教授验证

MAPPING OF ACUPOINTS FOR EACH RIGID HUMAN BODY
为每个刚性人体绘制穴位图

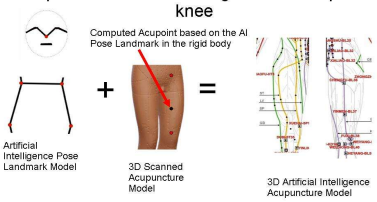
Acupuncture Points on Head and Neck



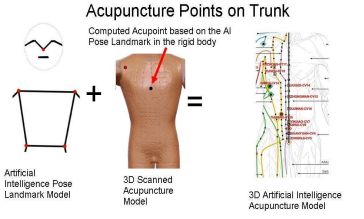
Acupuncture Points on Arm between shoulder and elbow



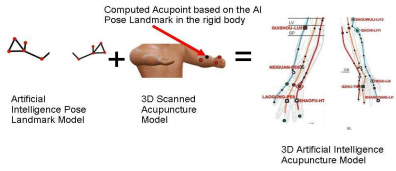
Acupuncture Points on Thigh between hip and knee



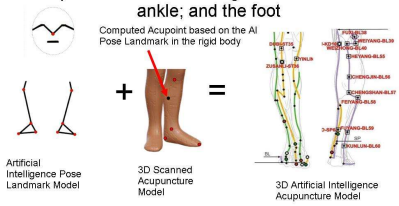
Acupuncture Points on Trunk



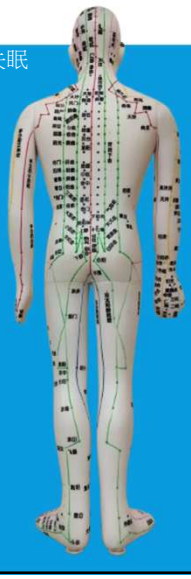
Acupuncture Points on Forearm between elbow and wrist; and the hand



Acupuncture Points on Leg between knee and ankle; and the foot



人體經絡穴位與病癥對照圖
Comparison chart of meridian points and diseases of the human body



頸椎病、頭暈、失眠
-大椎
肩臂痛麻-天宗
肩關節炎-肩椎
增生脊柱炎-胸椎
腰痛腰椎病-命門
腰間盤突出-陽關
腰痛、扭傷-腰眼

下肢麻木-風市

膽囊炎-膽囊

前列腺炎-三陰交

風池(頭痛、頸椎病)
肩井(五十肩、頸椎病)
肩中俞(頸肩綜合征)
肩髎(肩臂不舉、肩痛)
臂臑(肩臂不舉)

曲池(肘關節)
腎俞(前列腺炎、腰痛)
秩邊(坐骨神經痛)
外關(手指麻痛、腱鞘炎)
環跳(坐骨神經痛、股骨頭壞死)
承扶(坐骨神經痛)
殿門(坐骨神經痛)

委中(關節、腰腿痛)

承筋(坐骨神經痛)
承山(腰間盤壓迫坐骨神經)

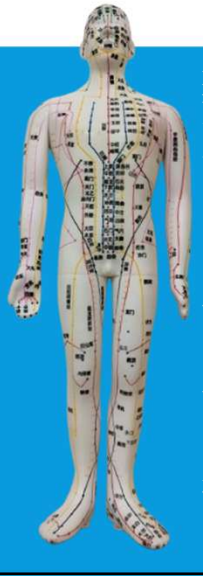
仆參(足跟骨痛)

頭痛、安神-印堂
鼻炎-迎香
哮喘、氣管炎-天突

哮喘特效、氣管炎-膻中

手臂麻-手三裏
內臟疾病-神阙
前列腺炎、痛經-關元
月經不調-子宮
腰間盤、股骨頭病-沖門

滑膜炎-鶴頂
關節炎、骨質增生-內外膝
眼瞼尾炎-瞼尾



太陽穴(頭痛、三叉神經痛)
氣戶(支氣管炎)
乳根(乳腺炎)
中腕(胃痛、嘔吐、胃痙攣)

伏兔(腰痛)

足三裏(腿沈、抽筋、胃痛)

沖陽(足麻痹、抽筋)

APPLICATION OF AI ACUPOINT DIAGNOSTICS IN RECURRENT ONCOLOGY (CANCER) PATIENTS
人工智能经络穴位诊断在复发性肿瘤（癌症）患者中的应用

- **鼻咽癌 Nasopharyngeal cancer**
  1. 痞根穴
  2. 肺俞穴
  3. 颈五穴
  4. 鼻衄穴
- **肺癌 LUNGS CANCER**
  1. 肺俞穴
  2. 中府穴
  3. 痞根穴
- **食管癌 ESOPHAGEAL CANCER**
  1. 辣根穴
  2. 食管下脸

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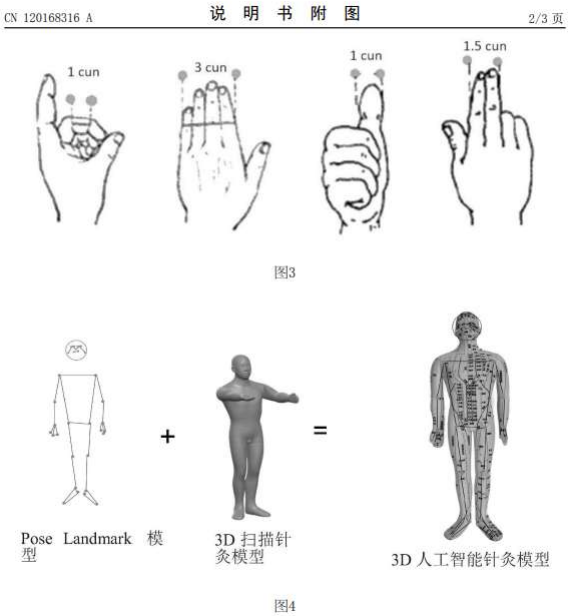
(54)发明名称
一种基于AI的人体穴位识别方法及其系统

(57)摘要
本发明提供一种基于AI的人体穴位识别方法及其系统，涉及人工智能技术领域，其中方法包括：对用户进行实时人体三维扫描，获得人体三维模型；追踪人体三维模型上的关键主体姿势地标；基于预先训练的AI穴位模型，根据关键主体姿势地标，识别人体三维模型上的穴位分布；输出穴位分布。



ARTIFICIAL INTELLIGENT MERIDIAN ACUPOINT DIAGNOSTICS
人工智能经络穴位诊断

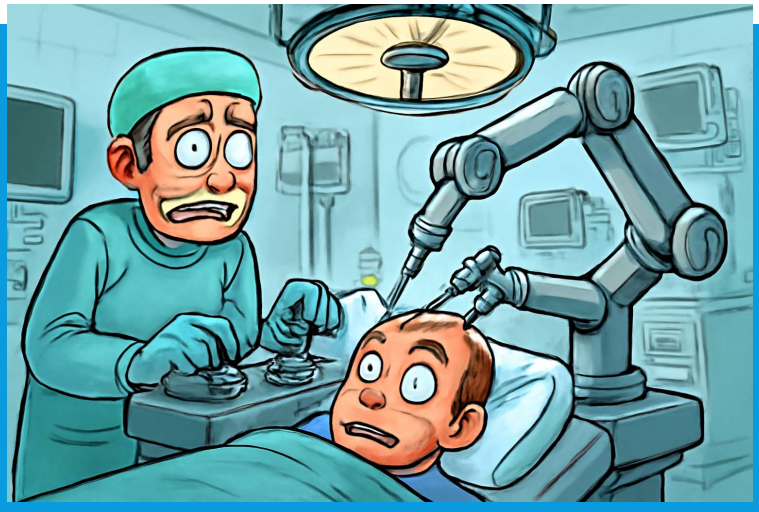
- AI Meridian acupoint diagnostics system has developed to provide an effective and low-cost detection of early and recurrent cancers and other 238 kinds of diseases.

人工智能经络穴位诊断系统已经开发出来，可以有效且低成本地检测早期和复发性癌症以及其他 **238** 种疾病。

- For digestive system, liver and gallbladder system, cardiovascular system, respiratory system, nervous system, endocrine system, and for ophthalmic, ENT, neurosurgery, oncology, and surgery.

适用于消化系统、肝胆系统、心血管系统、呼吸系统、神经系统、内分泌系统以及眼科、耳鼻喉科、神经外科、肿瘤科、外科等。

ROBOTIC OPERATION 手术机械人



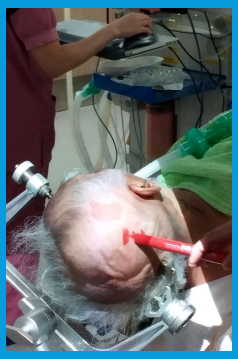
Picture created by Perplexity on 09 Aug 2025

Reforming robotic operation into high-precision surgery (such as spine & brain)

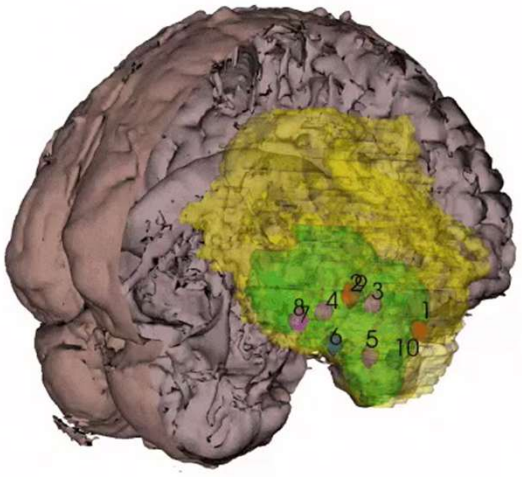
将机械人手术改造为高精度手术（如脊柱和脑部手术)

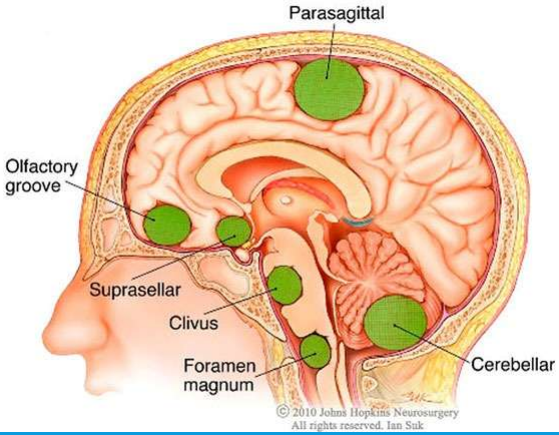
1.Accuracy of robotic arm 机械臂的精准度

2.Skills of the neurosurgeon 神经外科医生的技术

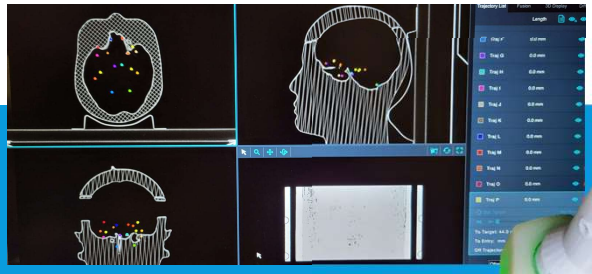


AI PREDICTION OF 3D LOCATIONS OF TUMORS
人工智能预测肿瘤的三维位置

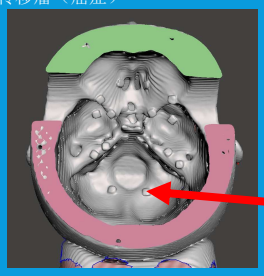


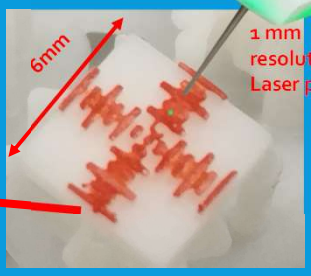


PHANTOM WITH AI PREDICTION OF 3D TUMOUR LOCATIONS人工智能预测 3D 肿瘤位置的模型



Skull base Brain metastases (Cancer) labelled with high resolution markers用高分辨率标记物标记的颅底脑转移瘤（癌症）



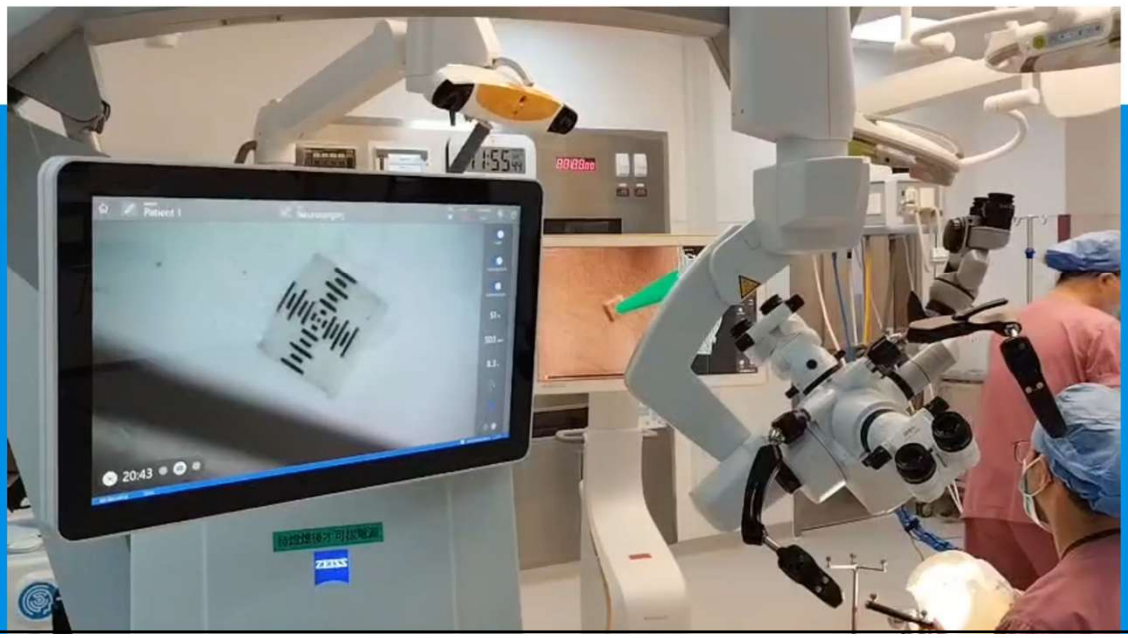


0.18 mm resolution of CT scan 电脑扫描分辨率0.18毫米

i) Computed Tomography machine电脑断层扫描设备

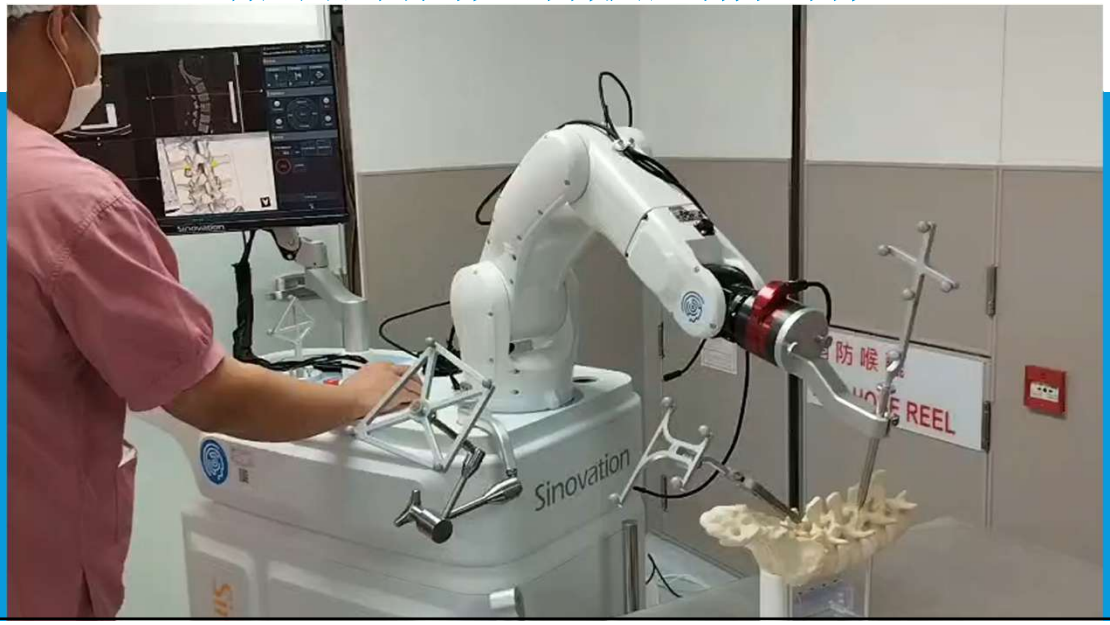
ii) Filmless Hospital project [Hospital Authority]无胶片医院项目 [医院管理局]

Image Guided Surgery Calibration 影像導引手術校準



Robotic Tracking 机器人追踪

Extend the scope of application from neurosurgery to spinal surgery
将应用范围从神经外科扩展到脊柱外科



Robotic spinal surgery 机器人脊柱手术

REFORMING ROBOTIC OPERATION INTO HIGH-PRECISION SURGERY
将机械人手术改造为高精度手术

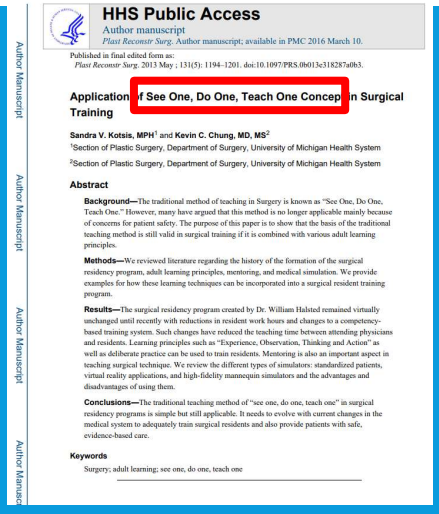
- Robot calibrated with a realistic human brain phantom and CT data of resolution of 1024 x 1024 voxels and 0.18 mm cut

使用逼真的人脑模型和分辨率为 1024 x 1024 像素、切口为 0.18 毫米的 CT 数据校准机械人

- Routine calibration

常规校准

REFORMING TRADITIONAL MEDICAL TRAINING INTO "SEE MANY, DO MANY, TEACHING MANY" STYLE
将传统医学培训改革为"看很多、做很多、教很多"模式



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Application of See One, Do One, Teach One Concept in Surgical Training

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[1]Section of Plastic Surgery, Department of Surgery, University of Michigan Health System
[2]Section of Plastic Surgery, Department of Surgery, University of Michigan Health System

Abstract

Background—The traditional method of teaching in Surgery is known as "See One, Do One, Teach One." However, many have argued that this method is no longer applicable mainly because of concerns for patient safety. The purpose of this paper is to show that the basis of the traditional teaching method is still valid in surgical training if it is combined with various adult learning principles.

Methods—We reviewed literature regarding the history of the formation of the surgical residency program, adult learning principles, mentoring, and medical simulation. We provide examples for how these learning techniques can be incorporated into a surgical resident training program.

Results—The surgical residency program created by Dr. William Halsted remained virtually unchanged until recently with reductions in resident work hours and changes to a competency-based training system. Such changes have reduced the teaching time between attending physicians and residents. Learning principles such as "Experience, Observation, Thinking and Action" as well as deliberate practice can be used to train residents. Mentoring is also an important aspect in teaching surgical technique. We review the different types of simulators: standardized patients, virtual reality applications, and high-fidelity mannequin simulators and the advantages and disadvantages of using them.

Conclusions—The traditional teaching method of "see one, do one, teach one" in surgical residency programs is simple but still applicable. It needs to evolve with current changes in the medical system to adequately train surgical residents and also provide patients with safe, evidence-based care.

Keywords
Surgery; adult learning; see one, do one, teach one

Traditional method of teaching

传统教学方法:

(Dr. William Halsted –

See One, Do One, Teach One concept)

（威廉·霍尔斯特德博士——"看一个，做一个，教一个"的理念）

INNOVATIVE APPLICATIONS OF TECHNOLOGY
技术的创新应用

- Artificial Intelligent (AI) - Aided 3D Human Organ Segmentation based on about 1,300 sets of image data (> 100 organs within each image dataset) *(without the use of expensive high-end computer)*

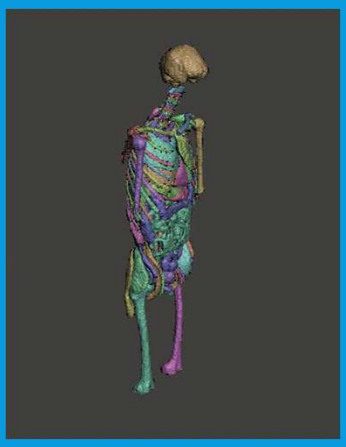
人工智能 (AI) - 基于约 1,300 组图像数据（每组图像数据包含超过 100 个器官）进行辅助 3D 人体器官分割（无需使用昂贵的高端计算机）

- Advanced the 3D Printing technique and optimized the materials改进了 3D 打印技术并优化了材料
- Implementation in hospital environment with 2,500TB DICOM image data for 7 millions population

已在医院环境中实施，涵盖 700 万人口的 2,500TB DICOM 图像数

22

ARTIFICIAL-INTELLIGENT-AIDED (AI-AIDED) SEGMENTATION
人工智能辅助（AI辅助）分割



AI Segmentation for organs

+

Threshold segmentation for lesions

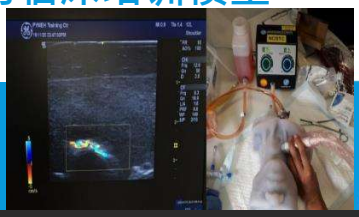
=

AI-Aided Segmentation

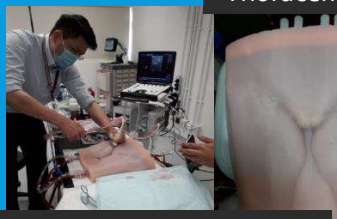
23

Clinical training models currently produced through new technologies
目前通过新技术制作的临床培训模型

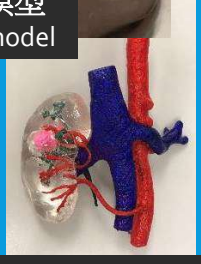
胸腔穿刺術模型
Thoracentesis model



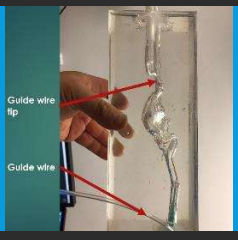
頸部血管插管模型
Cervical vascular cannulation model



血管插管模型
Vascular cannulation model

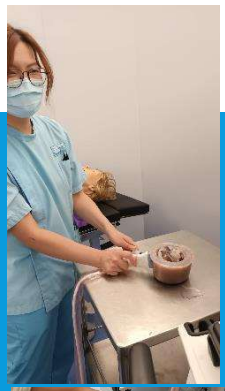


機械人腎部分切除術模型
Robotic partial nephrectomy model

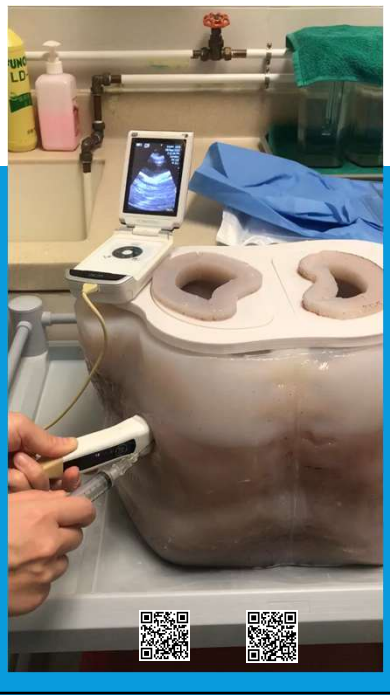


腦動脈瘤模型
brain aneurysm

胸腔穿刺術訓練
Thoracentesis training

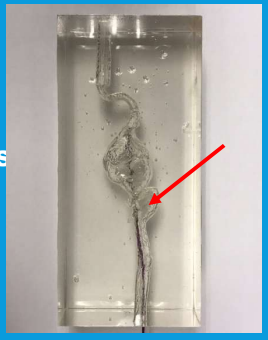




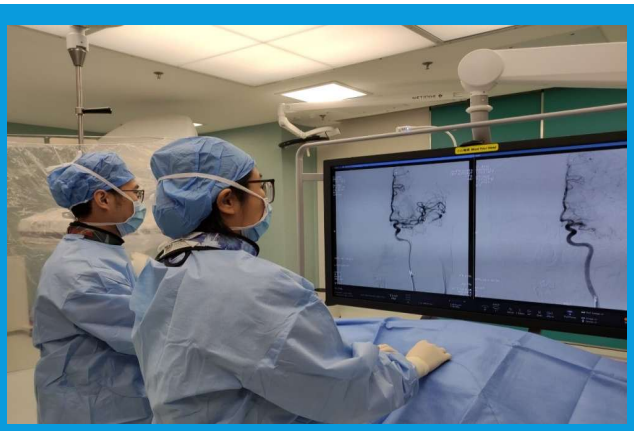


PERSONALIZED MEDICINE: BRAIN ANEURYSM MODEL
个性化医疗：脑动脉瘤模型

· Br ys

Personalized disease model

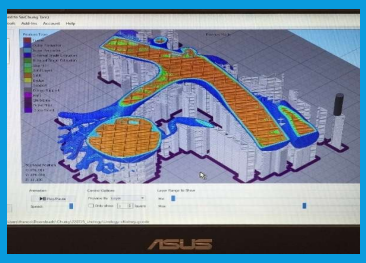


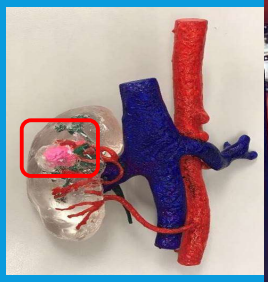
Operating theatre

26

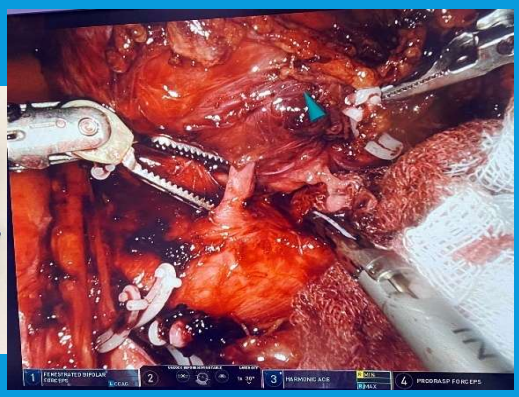
PERSONALIZED MEDICINE: ROBOTIC PARTIAL NEPHRECTOMY MODEL
个性化医疗：机械人部分肾切除术模型

· **Robotic Partial Nephrectomy**





Personalized disease model

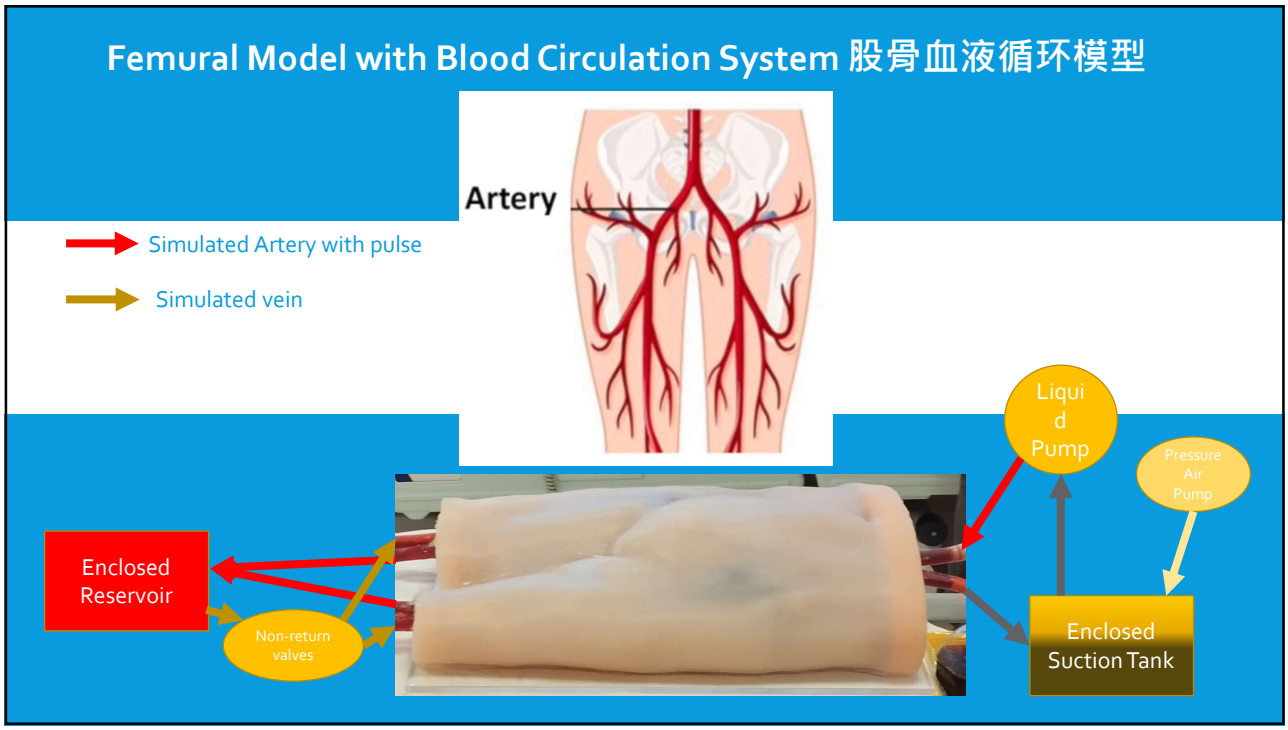


Operating theatre

(Avoid whole kidney removal and operating

VASCULAR CANNULATION MODEL PRACTICE
血管插管模型练习


Point of Care Ultrasound (POCUS) on Nasogastric Tube Placement Verification Course for HA Nurses (POCUS-NGT)
Course Aim:
To provide HA nurses with comprehensive training on application of Point-of-Care Ultrasound (POCUS) for Nasogastric Tube placement verification.
Course Content:
1. Lecture
2. Skills Demonstration
3. Skill Practice
4. Written examination
5. Skills Assessment
Course Duration:
- 4 hours (in AETC)
- Clinical Case practice & Skills Assessment
Certificate
A&E Training Centre POCUS-NGT for HA Nurses Certificate
CNE / CME Points:
CNE: 4 points
Course Fee:
HKD $1,400
Accident & Emergency Training Centre, RTSKH, Hospital Authority
US ON NASOGASTRIC TUBE PLACEMENT VERIFICATION
鼻胃管放置的验证


Femural Model with Blood Circulation System 股骨血液循环模型
Artery
Simulated Artery with pulse
Simulated vein
Liqui d Pump
Pressure Air Pump
Enclosed Reservoir
Non-return valves
Enclosed Suction Tank

傳媒廣泛報道
NEWS CLIPS ABOUT OUR 3D PRINTING ON SIMULATION AND TRAINING

The Government of the Hong Kong Special Administrative Region
Press Releases

Hospital Authority commended for promoting healthcare technology (with photos)

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The following is issued on behalf of the Hospital Authority:

The Hospital Authority (HA) has been committed to promoting the development of healthcare technology to enhance patient experience and the quality of clinical services through innovative technologies. Recently, the research team at Pamela Youde Nethersole Eastern Hospital (PYNEH), led by medical physicists Dr Carrison Tong and Mr Oliver Chan, was awarded the 2024 Global Innovation and Tech Excellence Award for Innovative E-Health Solutions Award (Public Sector) from the World Innovation, Technology and Services Alliance, often referred to as the "Oscar Award in the Information and Communications Industry", for their efforts in successfully developing a new technology for creating ultrasound-visible anatomical models with tactile reality.

Photo

創新意念獲得本地及國際認可和嘉許
Local Awards in IT, Engineering, Education, and Design

- **Design for Asia Silver Award 2024**
- **HKICT Smart Living Grand Award 2023**
- **HKICT Smart Healthcare Gold Award 2023**
- **HKIE Grand Award 2023**
- **EdTech Heros Merit Certificate 2023**
- **Institution of Mechanical Engineers (HK) 2nd Runner Up Award**

Engineering Award

Education Award

Design Award

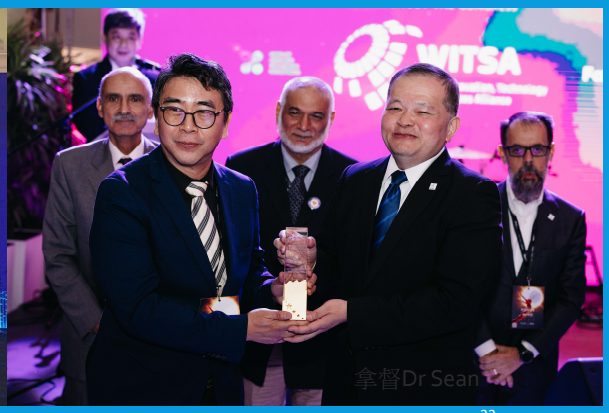

Smart Healthcare Awards


Engineering Awards

IT Award

INTERNATIONAL AWARDS国际奖项

Asia Pacific Information Communication Technology Alliance Award 亞太資訊通訊科技聯盟獎
Winner of a competition among 19 countries(在 19 個國家的比賽中獲勝)



WITSA Global Innovation & Tech Excellence Award
世界創新技術服務聯盟 全球創新與技術卓越獎
Winner of a competition among 80 countries (在 80 個國家的比賽中獲勝)

WITSA AWARD 全球创新与技术卓越奖(6/10/2024)

WITSA Global Innovation & Tech Excellence Award in Innovation eHealth
世界創新技術服務聯盟 全球創新與技術卓越獎

INTERNATIONAL AWARDS国际奖项(8/12/2023)

Invention Award

Innovation Award

Healthcare Award

Data Analysis Award

35

INTERNATIONAL AWARDS 国际奖项(8/12/2023 & 6/10/2024)

- 2023亞太資訊及通訊科技大獎 APICTA（社區共融及社會服務類別－健康與福祉）大獎
- 2023亞太資訊及通訊科技年度科技APICT（業務數據分析類別）優異獎
- 2023亞洲創新發明展覽會Invention HK（香港）發明金獎
- 2023 National Research Council of Thailand－Thailand Award For The Best International Invention & Innovation
- 2024 WITSA Global Innovation & Tech Excellence Award
  世界創新技術服務聯盟 全球創新與技術卓越獎

36

INVITED BY GOVERNMENT TO TAKE PART IN INNO-EXPO APRIL 2024

CCE and St Paul Hospital GM Visit

OGCIO Visit

Department of Health Visit

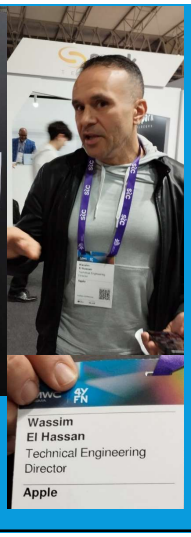
Hon. Edmund WONG Visit

Hon. Duncan CHIU Visit

Hon. Elisabeth Quat Visit

INVITED TO ATTEND INTERNATIONAL CONFERENCE BY GOVERNMENT
受政府邀请参加国际会议

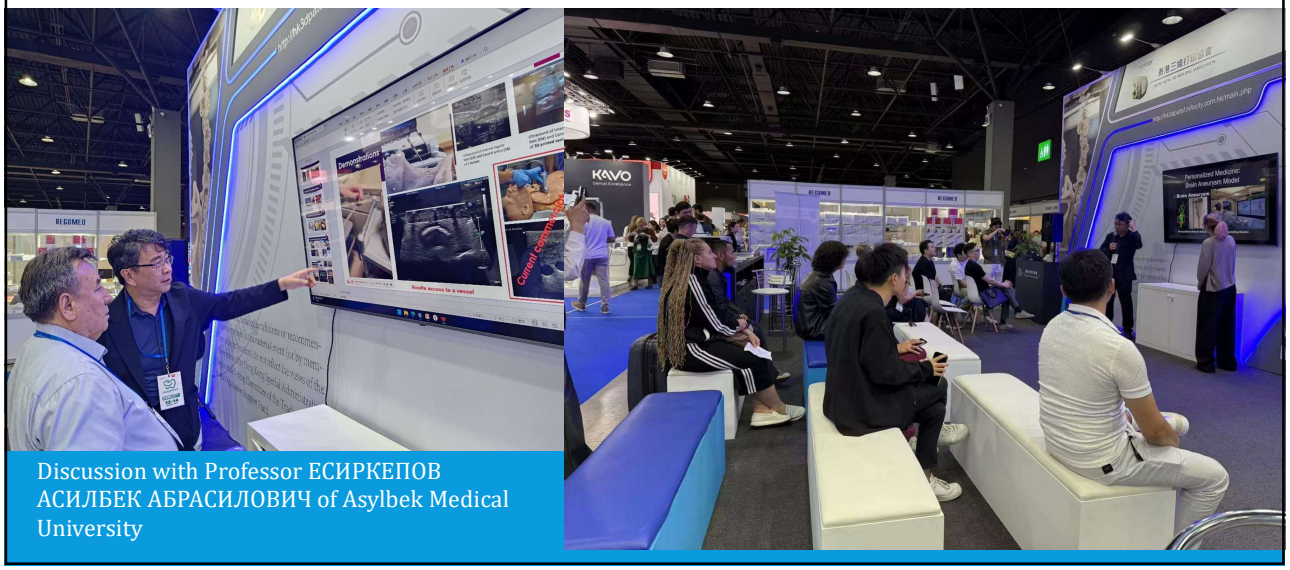
GSMA MWC™ Barcelona



Hong Kong Technology Pavilion at
Mobile World Congress, Barcelona
26 – 29 / 2 / 2024

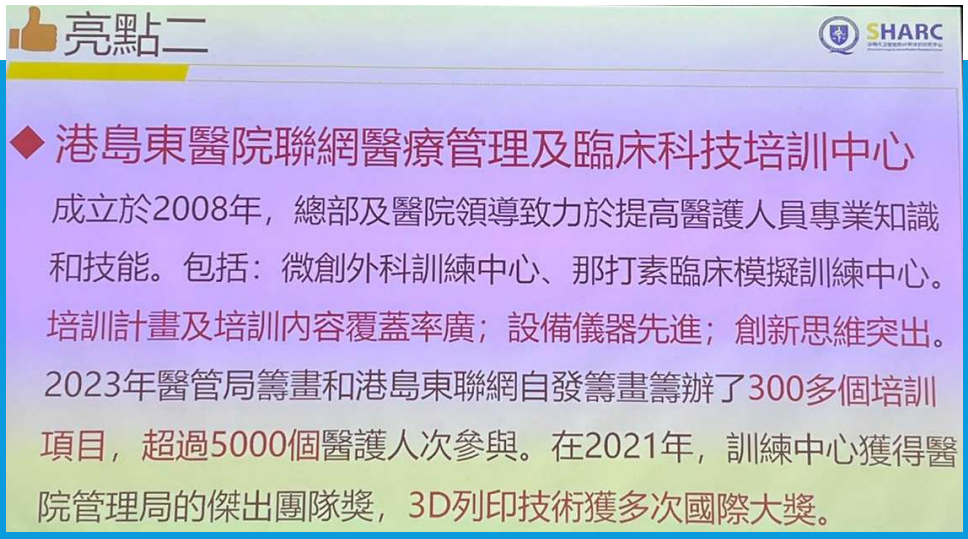
PRESENTATION IN KAZAKHSTAN– KAZIOR 14 MAY 2025

EXHIBITION IN KAZAKHSTAN



Discussion with Professor ЕСИРКЕПОВ АСИЛБЕК АБРАСИЛОВИЧ of Asylbek Medical University

HOSPITAL ACCREDITATION 医院认证2024



18 November 2024

結論 CONCLUSION – AIR

Treatment - AI provided information in simulating 3D locations of for the calibration and training of image guided robotic surgery (AI 提供模擬腫瘤三維位置的信息，用於影像引導機器人手術的校準和訓練)

Improved of OUTCOME- AI provided a tool for modernization of Traditional Chinese Medicine for healthcare and training (AI 為中醫藥現代化提供醫療保健和培訓工具)

Improved of TRAINING- From "See one, do one, teach one" (By Dr. William Halsted) to "See many, do many, teach many" using realistic, US visible, and haptical correct human model for medical training and simulation

从"看一个，做一个，教一个" 到"看很多，做很多，教很多"

>>>>>>>>>>>>>> **Safer for patients 患者更安全** <<<<<<<<<<

42

ENHANCED PATIENT CONFIDENCE & SATISFACTION
增强患者信心和满意度

Picture created by Perplexity on 09 Aug 2025

DIGITAL POLICY OFFICE VIDEO数字政策办公室视频2024

THANK YOU
谢谢

MUSEUM
MEDICAL SCIENCES
香港醫學博物館