

Would you get a massage from a ROBOT? Singapore's robo-masseuse 'Emma' begins work to treat back and knee pain

- Emma specializes in back and knee massages, mimicking the palm and thumb
- She uses sensors to measure the exact stiffness of a particular muscle or tendon
- She can calculate the optimal massage required and track a patient's recovery
- The aim is to address workforce shortages and quality consistency in healthcare

By [CECILE BORKHATARIA FOR DAILYMAIL.COM](#)

PUBLISHED: 22:01 BST, 9 October 2017 | **UPDATED:** 22:06 BST, 9 October 2017

104
shares

43

[View comments](#)

A robot masseuse specializing in back and knee massages has started work in [Singapore](#) today.

Named Emma, short for Expert Manipulative Massage Automation, it mimics the human palm and thumb to replicate therapeutic massages such as shiatsu and physiotherapy.

The company's technology aims to address workforce shortages and challenges with quality consistency in the healthcare industry.

Scroll down for video



Emma massaging a patient autonomously on the left while physician Calista Lim treats another patient on the right. Emma improves the productivity of the clinic as it can do the job of two massage therapists

Emma started work on 'her' first patients today at the NovaHealth Traditional Chinese Medicine (TCM) clinic, working alongside human colleagues - a physician and a massage therapist.

Emma 3.0 - the first to go in public service - is a third more compact than the first prototype revealed last year.

According to researchers at Nanyang Technological University (NTU) in Singapore who designed Emma, she provides a massage that is described by patients as almost indistinguishable from a professional masseuse.

Emma uses sensors to measure tendon and muscles stiffness, together with artificial intelligence and cloud-based

EMMA: THE FIRST ROBOT MASSEUSE

Emma, short for Expert Manipulative Massage Automation, specializes in back and knee massages, mimicking the human palm and thumb to replicate therapeutic massages such as shiatsu and physiotherapy.

Emma uses sensors to measure tendon and muscles stiffness, together with Artificial Intelligence and cloud-based computing to calculate the optimal massage and to track a patient's recovery over a course of treatments.

Emma is housed in a customized room with two massage beds, located in between both beds.

computing to calculate the optimal massage and to track a patient's recovery over a course of treatments.

Emma was developed by AiTreat, a technology startup company incubated at NTU.

The startup is just two-years old, but it's already valued at SGD \$10 million (USD \$7.3 million) after it recently completed its seed round funding, supported by venture capitalists from Singapore, China and the US, including Brain Robotics Capital LP from Boston.

Using Emma to help treat chronic pain management has the potential of creating low-cost treatment alternatives in countries where healthcare costs are high - and where aging populations have a growing demand for such treatment.

Albert Zhang, who led the development of Emma, said that she was designed to deliver a clinically precise massage, abiding to the prescription of a qualified traditional Chinese medicine physician or physiotherapist, without the fatigue faced by a human therapist.

The bot can massage one patient while the physician in the room administers treatments for the second patient, before switching.

Emma has a touch screen with a fully articulated robotic limb with six degrees of freedom - meaning she can move forwards, backwards, up, down, left and right, combined with rotation about three perpendicular axes.

At the end of the bot are two soft massage tips made of silicon, which can be warmed for comfort.



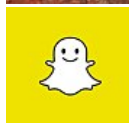
SHARE THIS ARTICLE

104 shares

RELATED ARTICLES



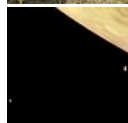
Scientists complete the world's first 'atlas of life:' New...



Is Snapchat DOWN? Users in a frenzy as some find they're...



Black rhinos to be re-introduced to Chad from South Africa,...



Spot the moons! NASA's Juno spacecraft sends back stunning...

'By using Emma to do the labor intensive massages, we can now offer a longer therapy session for patients while reducing the cost of treatment.

'The human therapist is then free to focus on other areas such as the neck and limb joints which Emma can't massage at the moment,' said Mr Zhang, who graduated from NTU's Double Degree program in Biomedical Sciences and Chinese Medicine.

In Singapore, a conventional treatment package for lower back pain which includes a consultation, acupuncture and a 20-minute massage, would typically range from SGD \$60 to SGD \$100 (USD \$44 to USD \$73).

At the NovaHealth TCM clinic, a patient could receive the same consultation and acupuncture but with a 40 minute massage, for SGD \$68 (USD\$50).

Emma is housed in a customized room with two massage beds, located in between both beds.

The bot can massage one patient while the physician in the room administers treatments for the second patient, before switching.

This means that Emma can always be massaging a patient, maximizing the clinic's productivity, and clinic staff can be reduced from five people to three, as Emma does the job of two masseuses.

Emma has a touch screen with a fully articulated robotic limb with six degrees of freedom - meaning she can move forwards, backwards, up, down, left and right, combined with rotation about three perpendicular axes.

At the end of the bot are two soft massage tips made of silicon, which can be warmed for comfort.

Emma has sensors and diagnostic functions which can measure the exact stiffness of a particular muscle or tendon, and the data collected from each patient is sent to a server in the cloud, and an AI computes the exact pressure to be delivered during the massage procedure.

Emma has a touch screen with a fully articulated robotic limb with six degrees of freedom - meaning she can move forwards, backwards, up, down, left and right, and rotate. At the end of the bot are two soft massage tips made of silicon, which can be warmed for comfort

The AI can also track and analyze the progress of the patient, generating a performance report that allow's a physician to measure a patient's recovery.

This proprietary cloud intelligence is supported by Microsoft, after Zhang and his teammates won the Microsoft Developed Day Startup Challenge last year.

Once's it's been proven that Emma cam improve the productivity and effectiveness of TCM treatmnts, Zhang says he hopes it could be a business model for others clinics to follow in future.

AiTreat is incubated at NTUitive, the university's innovation and commercialization arm.

The development of Emma is also on the TAG.PASS accelerator program by SGInnovate, which will see Zhang work with overseas teams to target multiple markets such as in the US and China.

CEO of NTU Innovation and NTUitive Dr Lim Jui said harnessing disruptive technologies such as robotics and AI to improve everyday life is what Singapore needs to keeps its innovative edge.

'We are proud to have guided Mr Albert Zhang in his vision to bring affordable healthcare solutions to the market for Singapore, which can alleviate some of the chronic pain problems which our elderly faces, ' said Dr Lim.

Running in parallel to Emma's work is a research project to measure and benchmark Emma's efficacy, comparing it to that a human masseur.

MOST WATCHED NEWS VIDEOS

Embed this </>

Moment SAS perform incredible helicopter

Shocking moment 'firework' explodes in

Driver overtakes lorry on dangerous

Two men suspected of stealing £60 from

Two men try to take on MMA fighter in road

Amazing release of three orangutans by

Shake your tail feather! This ostrich loves a

Man fatally gored by bull in the throat during

MOST READ NEWS



Japan's 'black widow' serial killer



Rapist attacked lone women, 22



Pictured: Airbase toilets where Army



Police watchdog investigates five



White more



Comments 43

Share what you think

Add your comment

Newest

Oldest

Best rated

Worst rated

View all

The comments below have not been moderated.



St George 1st, London, United Kingdom, about 18 hours ago

Back massage chairs have been around for decades.

New Comment Reply

Click to rate

3

0



David, UK, United Kingdom, about 20 hours ago

All well and good until a software glitch at line 1356 rams the arm into your spine and pins you to the table.

New Comment Reply

Click to rate

9

1



Clive Histon, Meh, Andorra, about 20 hours ago

For those looking for a "happy ending", you can just as easily go to Geylang in Singapore and legally hire a pro5tstitute.

▶ 'Love the Caitlyn Je snap of h Healey Sp next to da Kendall's Ladies wh

▶ Former I Chelsea s Mackintos in floral b cosies up fiancé Hu Range Ro

▶ 'I just pu alcohol!' (Robinson has lost 5 quitting d turning ve Slimmed-c

▶ A Bella (Birthday (shows off she hits tl Drake after celebratic her paren Gi








▶ 're Re Ch att dif fr

▶ Oh Cour dons crop leggings : down on : enjoying (mystery n CEMETER

▶ The look Rocco Rit he heads oversized jacket... a he's 'smit London s

▶ Mandy A three diffe busy pres pledges s those spe against H Weinstein

▶ Madonna sweet hug David as 1 Portugal's qualifier...

New Comment Reply	Click to rate	4	2
 Mikkeee, Birmingham, United Kingdom, about 20 hours ago	Cool		
New Comment Reply	Click to rate	3	0
 Patzi2447, Aurora, United States, about 21 hours ago	This sounds wonderful ! When are they going to be mass marketed. ?		
New Comment Reply	Click to rate	4	0
 David Gillies, San Jose Costa Rica, Costa Rica, about 24 hours ago	Where can I buy one? With my back in the condition it is I'd never leave home.		
New Comment Reply	Click to rate	7	0
 Paul, Asuncion, a day ago	What man could possibly trust a robot called EMMA which senses the "exact stiffness of a particular muscle?"		
New Comment Reply	Click to rate	9	2
 ElizaDay, The River, Australia, a day ago	Any added attachments? Asking for a friend ;-)		
New Comment Reply	Click to rate	8	1
 DemocracyRules, London, United Kingdom, a day ago	Corbychev won't like the idea of robots taking over.		
New Comment Reply	Click to rate	5	0
 MartyJB, Manchester, United Kingdom, a day ago	Well, I'm a little disappointed. With a couple of recent articles about advances in robotics in mind, I clicked on it thinking the woman in the white coat was the robot.		
New Comment Reply	Click to rate	17	0

[View all](#)

The views expressed in the contents above are those of our users and do not necessarily reflect the views of MailOnline.

Add your comment

▶ to Lisbon young for career

▶ 'Rockin lbs!' Marie shares th of himself Adorable k

▶ She's sc Jennifer C up to do s beekeeper picking up and traini role Busy bee

▶ 'She's bi accommo Smith pra partner D: and calls 'in the Et

▶ V Sh He Co ne Australian stars enc to suppor marriage

▶ Cuddling Weinstein that will n uncomfor for so ma Hollywood ladies

▶ Harvey V accused c Argento a himself o Jolie, Gw Rosanna Mira Sorv

▶ 'We need this beha Kidman b latest cele condemn Weinstein the wome

Enter your comment

Post comment to your Facebook Timeline [What's This?](#)

By posting your comment you agree to our [house rules](#).

Clear

Submit Comment

MORE TOP STORIES

▶ Emma Watson's 'sexual assault' by 'sexual assault' women at 'awe-struck' bravery' a breaks silence Harvey Weinstein

▶ Anne Rice reveals her having an affair with newlywed Presenter for the first time in document

▶ 'Wish the still around fans go wild unite 25 years Katie Price beau Ace turned to

▶ 'I just don't understand Kelly Queen and Jamie 'split' say be more than viewers' E

▶ 'I'm dy...
Si...
me...
he...
im...
ne...
Ch...

▶ The Crown gives fans Actress's myriad of studs as new film in Dripping with

▶ Gosh, the scrumptious really can smug clear brigade: C LETTS see another side from his r

▶ Suki Waterhouse holds her boyfriend 37, as the romantic before we Woody Allen

'No wonder look at her Hughes' 'I Katie Price

▶ as her p
backs '52
screensh

▶ Timothy
slimmer t
steps out
studded p
Party duri
BFI Film F
Shrinking

▶ Only Rit
models a
over-the-t
ballgown
Tuesdays
Instagram
Move over

▶ Apprent
Anisa Top
on her fia
another c
mi
No
de

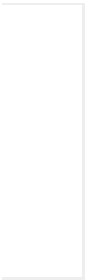
▶ E
Ni
he
bu
sh
as she en
soaked st

▶ Green w
Fanning l
a green A
crisp blou
heads to :
Allen film
Leggy lady

▶ 'Good ti
Alessand
flaunts he
does Vict
workout v
Paltrow's
Anderson

▶ Is that y
Kidman l
unrecogn
appears c
and unfla
print top
Boy Erase

▶ REVEALE
once pub
confronte



▶ Weinste
'attacked'
girlfriend
Paltrow

▶ Rose Mc
Ben Afflec
after the a
his silenc
Harvey W
years afte
Hunting C

▶ Heather
Harvey W
wife was i
with other
details ho
alluded to
of sex for

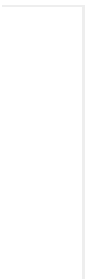
▶ Leggy la
Murgatroy
cut-offs fo
Wi
rel
hu
Ch
Siz

▶ J
fla
cle
black jum
studded A
bash... as
down to h
debut

▶ Naughty
Home An
Raechelle
little to th
in a VERY
designer !
Specsave
event

▶ Not so b
Tallia Stor
INCH stile
ab-flashin
despite th
heading to
Impractica

▶ 'Very tra
O'Donnell
ex-wife M
Round's s
she make
appearan
at premie



▶ 'It felt lik
Chris Hen
gushes o'
with wife
Horse Sol
admits it'
Cute coup

▶ The Rea
of Dallas'
Hollman c
on the flo
during WI
booze cru
Loving life

▶ 'I stuffec
pants': Le
confesses
STOLE to
the White
souvenir
Loving life

▶ Ben Affl
great as h
recovery o
treatment
alcoholis
FINALLY o
Hampy W

▶ J
gr
Te
Ha
all
lat
his

▶ 'Are peo
this stupi
Beadle's j
girlfriend
hits back
users who
small bab

▶ Kate Ma
glamour i
illusion di
classic bl
supports
Jamie Bel
premiere

▶ Sherloc
Freeman o
outing wit
friend in l
almost on
shock spl
Amanda /

▶ Little Mix'
Thirlwall o
costumes
carpet fro
(but shop



▶ to be VE
to try out
looks)

▶ 'It depen
doughnut
French, 6
regaining
weight los
shocks fa
youthful l

▶ No likey
Paddy Mc
wife Chris
contains l
popping a
sheer bus
poses for

▶ Return c
The Leagu
Gentleme
Shearsmi
Pe
be
se

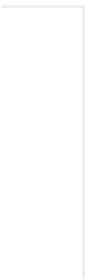
▶ L
fla
in
en
sh
Daisy Lov
feel sexy

▶ Debbie I
dazzles in
dress as s
break from
attend op
Mel Brook
Frankens

▶ EXCLUS
the Pope
to town!
Ken Doll j
'hand pai
he parade
physique

▶ 'Happy E
you so mi
Shaik pos
tribute to
Ruckus a
celebrate
Vegas

Prince Mi
looks dap
tie as he r



▶ guests a
exhibition
London's
Gallery

▶ Pixie Lo
chic in a r
jacket and
after fianc
Cheshire
driver wh
11 people

▶ Cosmeti
enthusias
looks deli
Bobby No
results of
her while
Transform

▶ Move as
Reese Wi
lookalike
Ph
en
at
Pa

▶ F
Ho
ble
in
as she cu
Nathan M
baby show

▶ 'It kills n
Pfeiffer, 5
her age o
she talks
down 199
Louise... \n
STILL has

▶ Tess Ho
tribute to
for 'break
around m
by talking
struggles
World Mer

▶ Nearly n
Cooper's
Shayk loc
in lacy lin
months at
baby girl
Sizzlinf sh

EXCLUSI
Gordon o

▶ Kristina after she 'her bath DailyMail' responsik

▶ Heidi Kl envious p skimming as she co fashion co Lidl Leggy lady

▶ From mi stardom? 'wants to seriously' Selena Ge filming lat Allen drar

▶ 'It scare of me' Ju ad by we La fol

▶ F sti cr after callin Carey Har dad and s terrible bc

▶ Suits yo Bonas fla midriff in and match trousers a the Doubl premiere

▶ Doctor V episode S been SAV BBC arch fourth Tin Baker rep shooting

▶ Precious Queen an corgis bo Aberdeen London a summer t Balmoral



▶ Smiling shows off legs in leggings ; through wrapping Cat On A run

▶ Jackie C daughter a lesbian followers support a 'mocked' Hong Kor

▶ 'I overth dramatic, to 100': M her flaws describes life with h Ashton K

▶ Bump in Apple: Pr Brooklyn off her sh bardot dr bemoans sw

▶ 'I my Cf ma to ah we

▶ So in lov Elgort and Violetta K courtside game in N Square G: High scho

▶ 'Does st bad day?' down Hol is shower for her 'cl she stuns statement blouse

▶ Sultry K sizzles in bra for he lingerie co with Kylie 'pregnant noticeabl

'I'm on he percent': defends d figure ska

▶ **Harding in the new Tonya**

▶ **'I'm thin! Pregnant sends social media fans calling to baby'... w branding**

▶ **Game Of Thrones: Final season MORE de engaged l and Rose wedding v filming to**

▶ **Teary Li: shares he sadness' grandmot ca ad 'w**

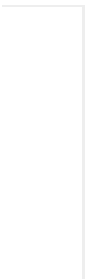
▶ **'I En fa Ca do on screen Last Jedi**

▶ **Strictly: doing a v then!' Baf Conley hi claims he special tr show emp**

▶ **SPOILER! who's bac Street's A films her t she reurr Connor al Shayne W**

▶ **We are f Philip anc Sweden s official pc foursome Alexandre Prince Ga**

Holding n Exhauste collapses



▶ bar as s
sweat dur
boxing se
York

▶ Michelle
reveals to
stunts on
seven and
frame... a:
having NC
about nev

▶ Dancing
Stars: Jor
scores fir
season w
dance de
adoptive |
Audience

▶ 'He's go'
Vanessa I
Maksim C
as
Da
Dc

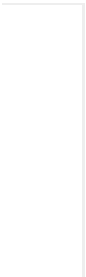
▶ E
Ja
co
loi
as he thal
daughters
London s

▶ Hard to
Rooney p
Simpson
leggy disj
print mini
London...
Coleen di
ring

▶ 'She was
Newly-en
Harrington
fiancée R
threatene
following
April Fool

▶ He really
balls! Dav
earns 'mo
£1million
pays him:
day'... fou
retiring





▶ **Stranger**
Millie Bob
blows kis
as she an
studios w
blue dres
statement

▶ **EXCLUS**
Griffin do
mask as s
the stage
president
is her 'per
Weinstein

▶ **'It makes**
Kimberley
reveals ar
slim frien
back into
giving bir
has to 'wo

▶ **Dexter F**
looks wor
his forme
appears c
talk about
horror flic

▶ **F**
Na
fir
Ry
ca
Da
ro

▶ **'Everyor**
complicit'
George C
Jennifer L
the conde
Harvey W
Speaking

▶ **Looking**
doesn't c
Victoria B
shares £2
regime - v
toothpast
anti-agein

▶ **'That is :**
tongue...'
Cyrus lick
stamps in
look at he
Karaoke s
Late Late
Party trick

GMB's Su
forced to
guest blu
word LIVE
recalling :

▶ commer
cat-called

▶ Victoria'
Izabel Go
showcase
legs in sk
while cud
footballer
Trapp on

▶ Bad gra
Jolie's fat
Voight, 78
drug-fuell
12 prostit
dropping
Ray Dono

▶ Ex-boyfi
Towie's F
injured 17
acid attac
heard me
sp
Ar

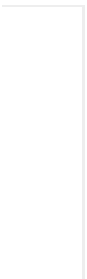
▶ "I
pri
Co
wt
ap
ho
day

▶ She's ey
Busty Kin
almost sp
VERY rau
sheer bra
a late pit-
a bag of f

▶ Glamorc
Willoughk
narrow w
at her sle
slinky red
new Diet
campaign

▶ Betty an
have land
Riverdale
Sprouse a
Reinhart f
rumors at
Airport

'There we
shots!' Ol
King and
Matthew f



▶ 'fairytale
they let lo
'emotiona

▶ 'She sup
predator':
Weinstein
comes un
fans urge
her label l
loved by s
husband':

▶ (Pold)ar
Turner ch
middle fin
with Elear
Tomlinso
Reed tuck
phone int

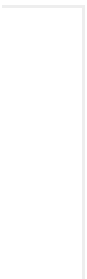
▶ Defiant l
on VERY
display in
kick
in
br
cri

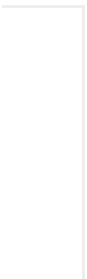
▶ Y
Ka
ho
th
prepares
to royal d
first time

▶ EXCLUS
Solomon
about filte
anorexia ·
fighting it
Lizzie Cui
battle and
stone

▶ Frankie
REMEMB
the Middl
no memo
childhooc
suffering
and conc

▶ Chris Eu
Lily Allen
known fo
drugs and
she accus
of abandc
row over





▶ Holmes hammer! property ('not aware Tom Cruise daughter photosho adverts for flats

▶ Gordon NEVER to nemesis until he and wife Tana size' jibe... miscarria

▶ 'Wow... t recognise French st with her r youthful c she revea nearly 60 Show

▶ Liar: Eag bemused that prove ITW's Kan we did YC is'

▶ M su tea ab unzipped party in L Low-key

▶ Glowing Love? Ca Sofia Rich a rare app without b Disick, 34 errands ir

▶ America Underwea Reid step new man a VERY ra flashing s Hollywood

▶ Kate Hu VERY ani for Marsh as co-star shares cli reaction t trailer

Rachel Bi Hayden C

▶ spotted
time toget
split.. as i
Emma Ro
have play
break-up'

▶ Her birth
Hadid pos
snap befo
to party in
satin dres
milestone
Cheeky

▶ 'I've nev
kind of de
life's beer
time': Ge
reveals tr
first love
heartbrea

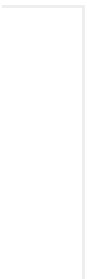
▶ L
Hu
te:
ha
wi
an
un

▶ H...
casual fig
sports Jo
Division e
jumper wl
former fla
Koma

▶ Scar of 1
Corrie's E
sports blc
bruises al
as she tra
car crash
short film

▶ Ryan O'
casual fig
enjoys the
alongside
Malibu be
recoverin
surgery'

'Bring it o
Morgan c
Harrison |
Jones ins
showdow
Susanna



▶ can pun
'anytime'



GADG

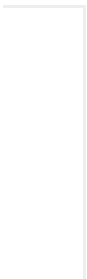
Apple W
that libe

46 cor

iP
st

40 cor

OnePlus



6 com

Give yo
of 'black

4 com

Is this tl
MailOnl

6 com

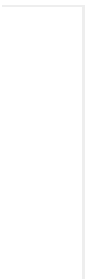
Samsun
and a di

1 vide

The Elg

comm

Is it real
Nintend



7 com

The \$1,0
worth tr

comm

The hi-t
could cl

comm

The bes
ever he



[Back to top](#)

[Home](#) | [News](#) | [U.S.](#) | [Sport](#) | [TV&Showbiz](#) | [Australia](#) | [Femail](#) | [Health](#) | [Science](#) | [Money](#) | [Video](#) | [Tr](#)

[Sitemap](#) | [Archive](#) | [Video Archive](#) | [Topics Index](#) | [Mobile Apps](#) | [Screensaver](#) | [RSS](#) | [Text-based site](#) | [Reader Prints](#) | [Ou](#)
[Daily Mail](#) | [Mail on Sunday](#) | [This is Money](#)
[Metro](#) | [Jobsite](#) | [Mail Travel](#) | [Zoopla.co.uk](#) | [Prime Location](#)

Published by Associated Newspapers Ltd
Part of the Daily Mail, The Mail on Sunday & Metro Media Group

© Associated Newspapers Ltd

[Contact us](#) [How to complain](#) [Advertise with us](#) [Contributors](#) [Terms](#) [Discount Codes](#) [Black Friday 2017](#)