

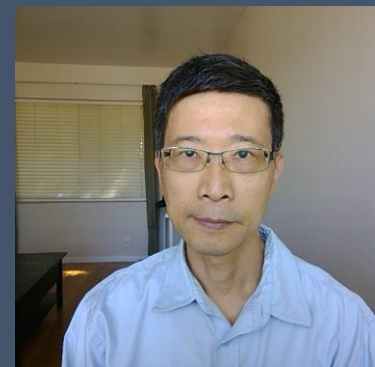


善用AI，邁向虛實融合的世界

Leveraging AI toward the Metaverse

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微軟亞洲研究院副院長

Eric Chang, PhD
Microsoft Research Asia



New Normal



CLOUD

INNOVATION

CXO


HARDWARE

MORE ▾

NEWSLETTERS

ALL WRITERS

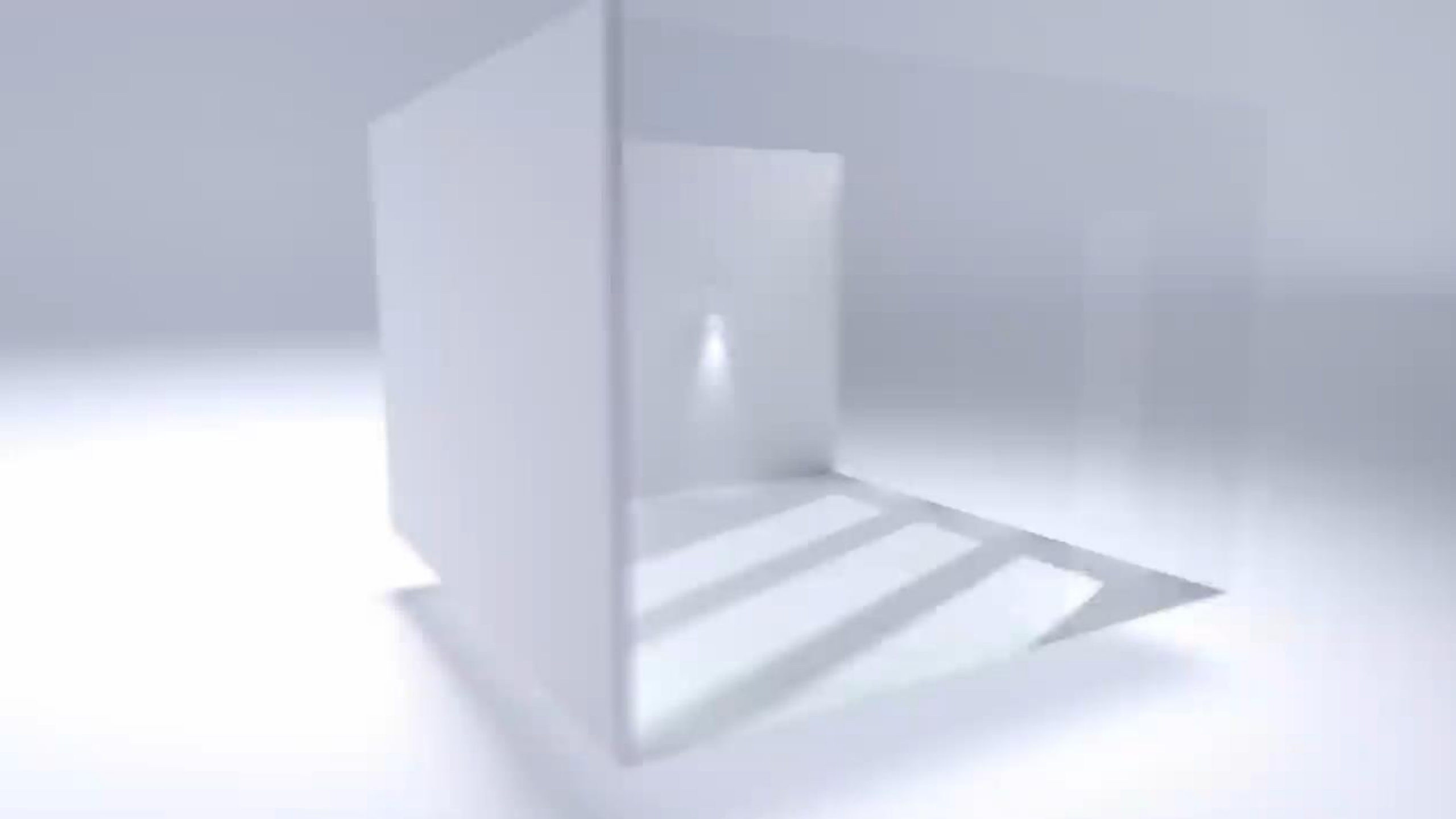


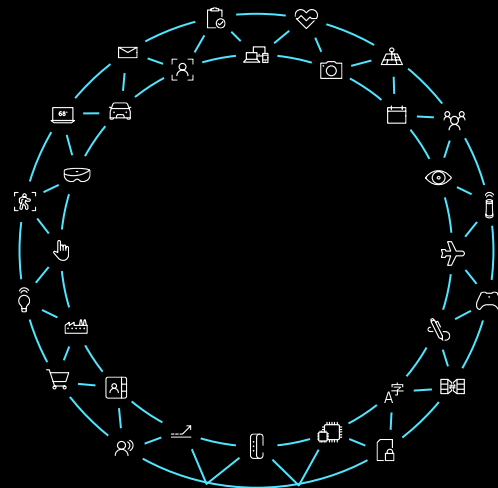
 MUST READ: [Elon Musk's brain-computer startup is getting ready to blow your mind](#)

PART OF A ZDNET SPECIAL FEATURE: [TECH BUDGETS 2021: A CXO'S GUIDE](#)

Offices, work sites, employee roles to be reconfigured post COVID-19, say CFOs

PwC finds that CEOs are actively considering what the new normal of work looks like after COVID-19. Think remote work, automation and a lot of retooling of work spaces to maintain social distancing.





Intelligent Edge



Intelligent Cloud

Solutions



Intelligent Edge



Intelligent Cloud

┌ Digital Twins ─┐

An aerial night view of a city skyline, likely Hong Kong, with numerous skyscrapers illuminated by lights. The sky is dark with some light clouds. The text is overlaid on the center of the image.

What can you do with
Digital Twins?

Synchronize



Physical Environment

Digital Environment

Monitor



Physical Environment



Digital Environment

Track the past



Physical Environment

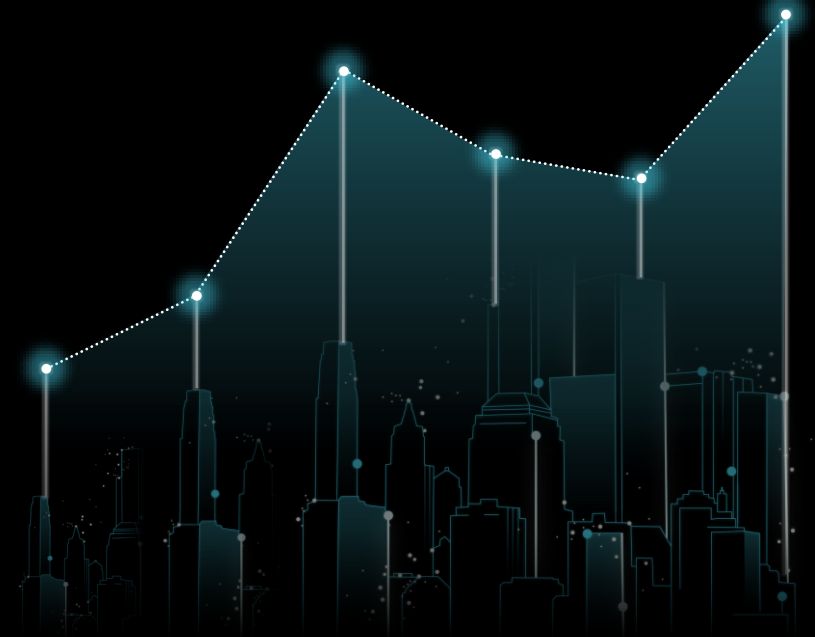


Digital Environment

Analyze



Physical Environment



Digital Environment

Predict



Physical Environment

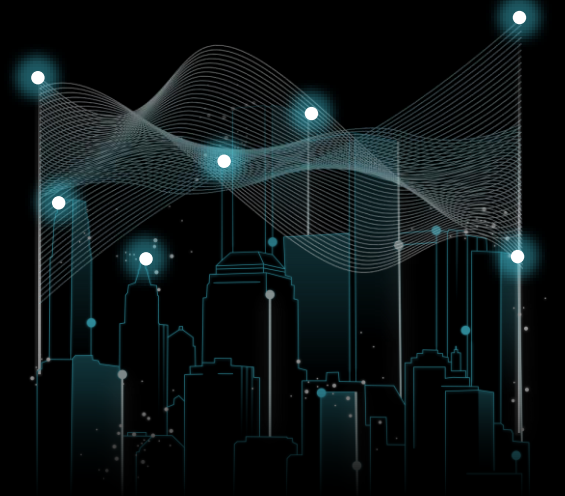


Digital Environment

Simulate



Physical Environment



Digital Environment

Autonomous Control



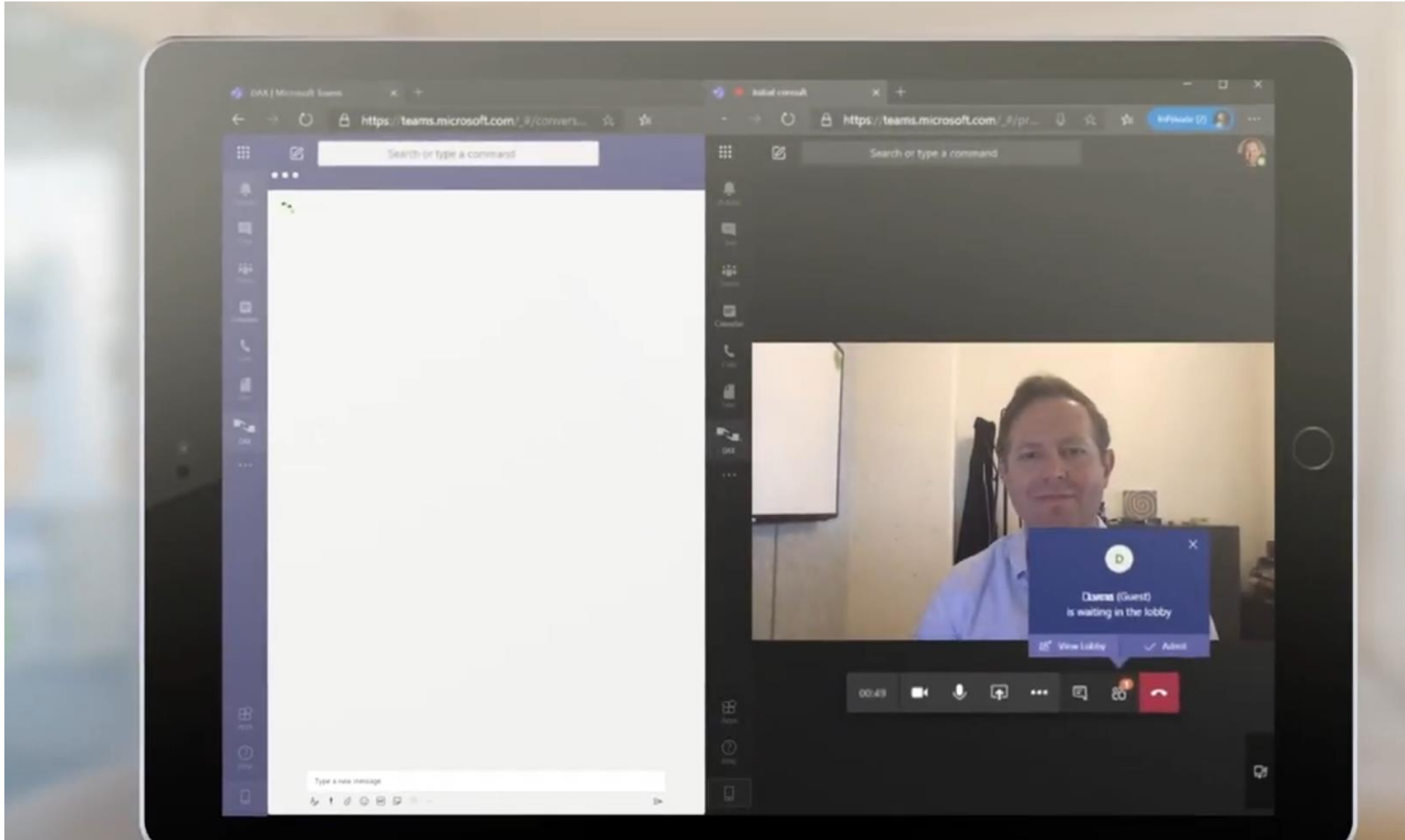
Physical Environment

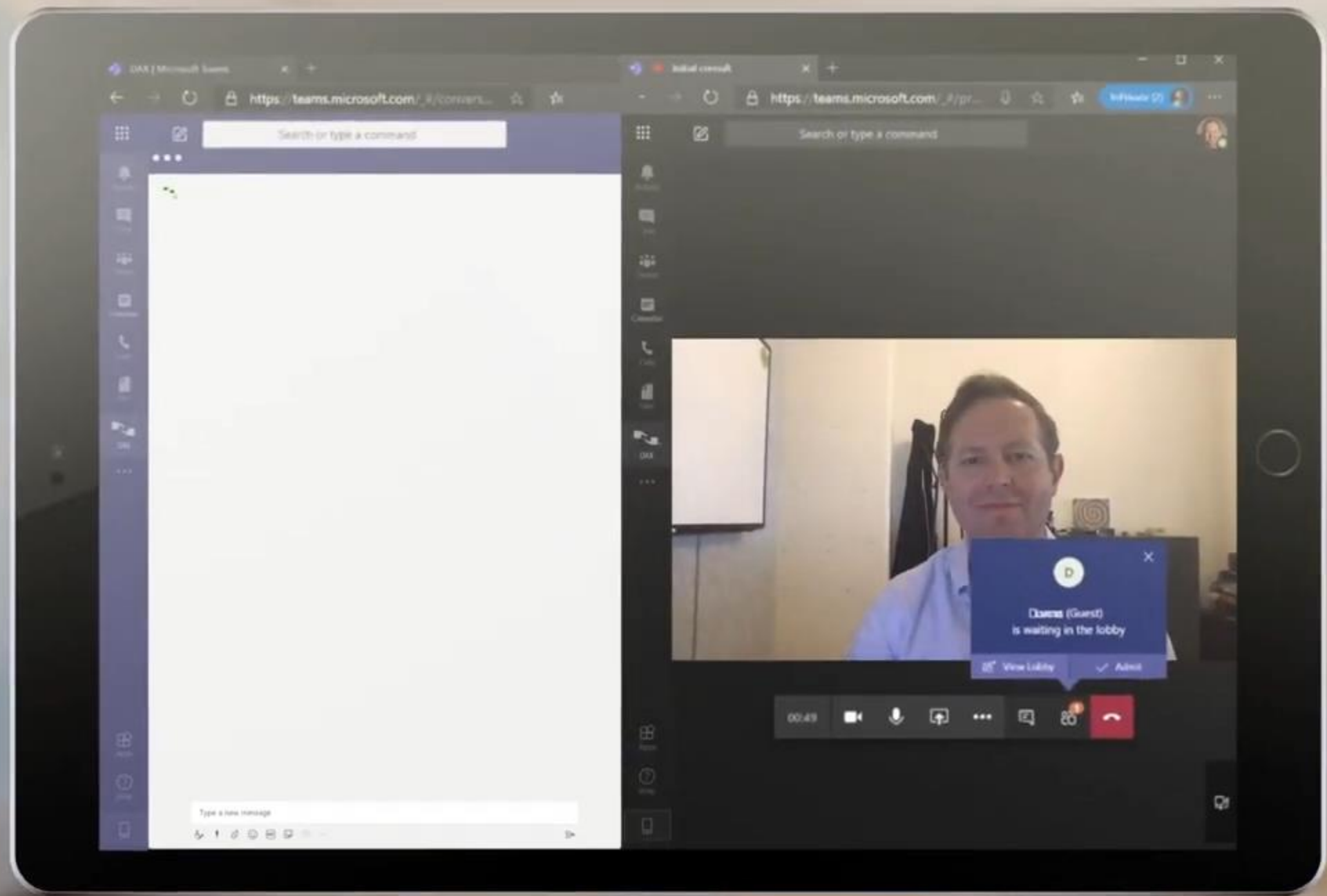


Digital Environment



Support Better Tele-Health



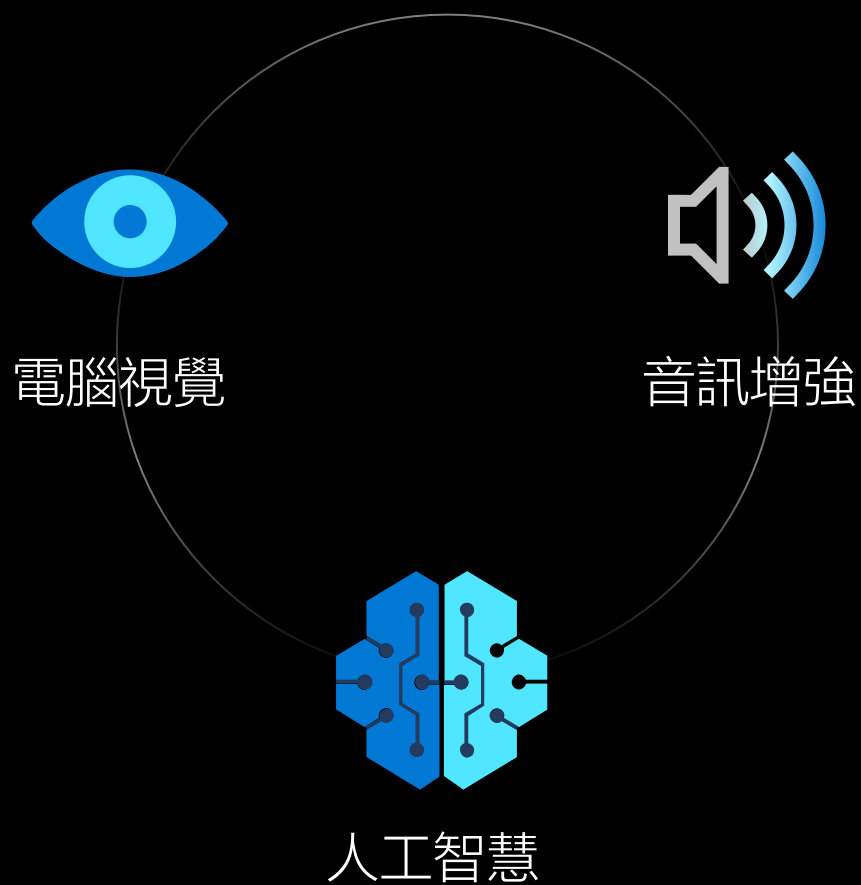


AI驅動的多媒體體驗

線上交流中的即時、智慧與沉浸式會晤體驗



即時通訊 (RTC)



電腦視覺

音訊增強

人工智慧

AI驅動的多媒體通訊：電腦視覺

- 肖像分割：微軟Teams中視覺特效的基礎



虛化/自訂背景



Together模式

- 相關技術：視頻光照調整，自動取景，語音驅動頭像運動

AI驅動的多媒體通訊：音訊增強

“Background blur was obviously a big thing. We are soon rolling out a feature where using AI we can actually remove that background noise. It's kind of blur for voice.”

背景虛化非常重要。我們即將推出一個新功能，通過使用AI來消除背景雜音，可以稱之為聲音的背景虛化。
-- Satya's LinkedIn post



主觀評估 (用戶評分)

Method	Synthetic	Recording	Average
Noisy	3.09	2.90	3.01
TFNet	+0.36	+0.40	+0.38
SkypeNS	+0.19	+0.14	+0.17
Krisp	+0.28	+0.27	+0.27

從 OCR 到 文檔理解



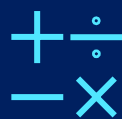
通用OCR

檢測並識別任意場景圖像中任意語言文字



通用表格識別與理解

檢測識別並理解任意場景圖像中包含任意語言文字的表格



通用數學公式識別

檢測並識別任意圖像中的數學公式



通用表單票據理解

從包含任意語言文字的表單票據圖片中抽取關鍵資訊

擁抱OCR和文檔理解技術，助力企業數位轉型

通用OCR的主要難點

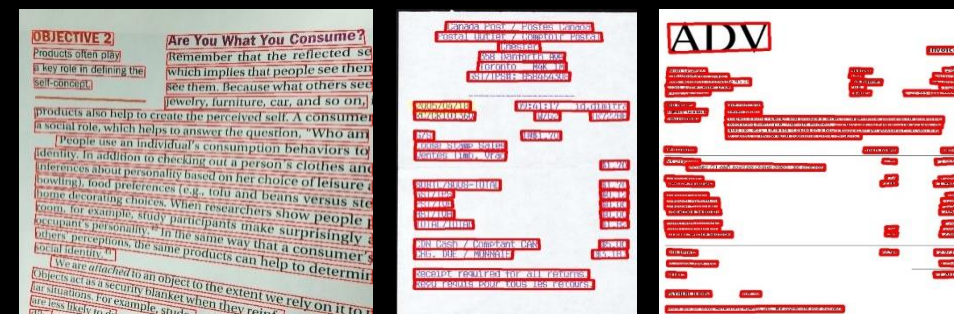
自然場景圖像中文字檢測識別的難點

- 文字本身的多樣性
 - 各種語言、字元、字體、大小、顏色、方向、排版等
 - 任意方向、任意形狀文本行
- 圖像拍攝過程中引入的幹擾因素
 - 低解析度、不規則幾何形變、非均勻光照、低對比度、模糊、噪聲、遮擋等
- 複雜背景



傳統文檔圖像中文字檢測識別的難點

- 密集彎曲長文本行
- 極小文本間距



Read 3.0+



文檔中的文本



自然場景中的文本

Read 3.0+

<p>SUMMER FRUIT 鲜榨果汁 (400cc/ 500cc)</p> <p>#12 12 15 12 13 13 13 16 #15 15 18 15 16 16 16 20</p>	<p>西瓜汁 梨汁 橙汁 西瓜梨 梨橙 西瓜橙 梨柠檬 橙柠檬</p>	<p>FRUIT TEA 霸煮水果茶 (1000cc)</p> <p>霸气水果茶 霸气芒果 霸气柠檬 霸气橙子 霸气红柚</p> <p>15 15 12 14 14</p>	
<p>CLASSIC PORT 经典灌式 (400cc)</p> <p>10 12 10 10 10 12 12 14</p>	<p>丝袜奶茶 丝袜奶盖 红豆奶茶 血糯米奶茶 珍珠奶茶 港式咖啡 香港鸳鸯 鸳鸯奶盖</p>	<p>SUMMER TEA 夏日凉饮 (500cc/ 1000cc)</p> <p>#8 8 10 10 10 #12 10 12 12 14</p>	<p>冻柠茶 柠檬水 冻柠蜜 冻柠七 龙凤柠七</p>
<p>CLASSIC FOOD 港式小吃</p> <p>10 15 12 12 12 12 12</p>	<p>原味鸡蛋仔 咸蛋黄蛋仔 巧克力蛋仔 葡萄干蛋仔 黑芝麻蛋仔 桂花鸡蛋仔 红豆鸡蛋仔</p>	<p>CLASSIC FOOD 港式小吃</p> <p>8 8 8</p>	<p>咖喱鱼丸 咖喱鱼蛋 咖喱双拼</p>

	Drive on the left
	Conduise a gauche
	Links fahren
	Tenere la sinistra
	Conduzca por la a izquierda
	Links rijden

混合語言

Read 3.0+

Azure AI Form Recognizer

從文檔圖像中檢測識別文字，抽取關鍵欄位元及表格資訊



Bill To: Contoso, Ltd Phone: 432-555-0189 Invoice #: 3-456-2
Fax: 432-555-0123 Invoice Date: 4/14/2019
Email: contoso@example.com

Invoice For: Project 2

Item #	Description	Qty	Unit Price	Discount	Price
Z4567	Invoice 3-456-2 Data 1	39	\$ 5.00	\$ -	\$ 195.00
Z4568	Invoice 3-456-2 Data 2	40	4.00	5.00	155.00
Z4569	Invoice 3-456-2 Data 3	30	6.00	7.00	173.00
Z4570	Invoice 3-456-2 Data 4	40	7.00	-	280.00
Z4571	Invoice 3-456-2 Data 5	10	4.00	-	40.00
Z4572	Invoice 3-456-2 Data 6	5	8.00	-	40.00

Key-value pairs

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Microsoft Dynamics 365/Connected Store

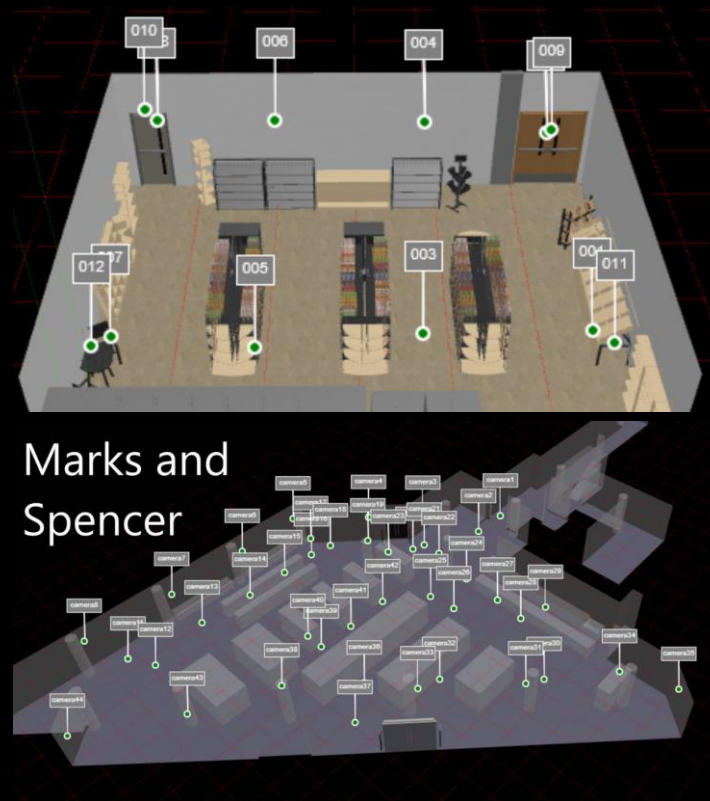
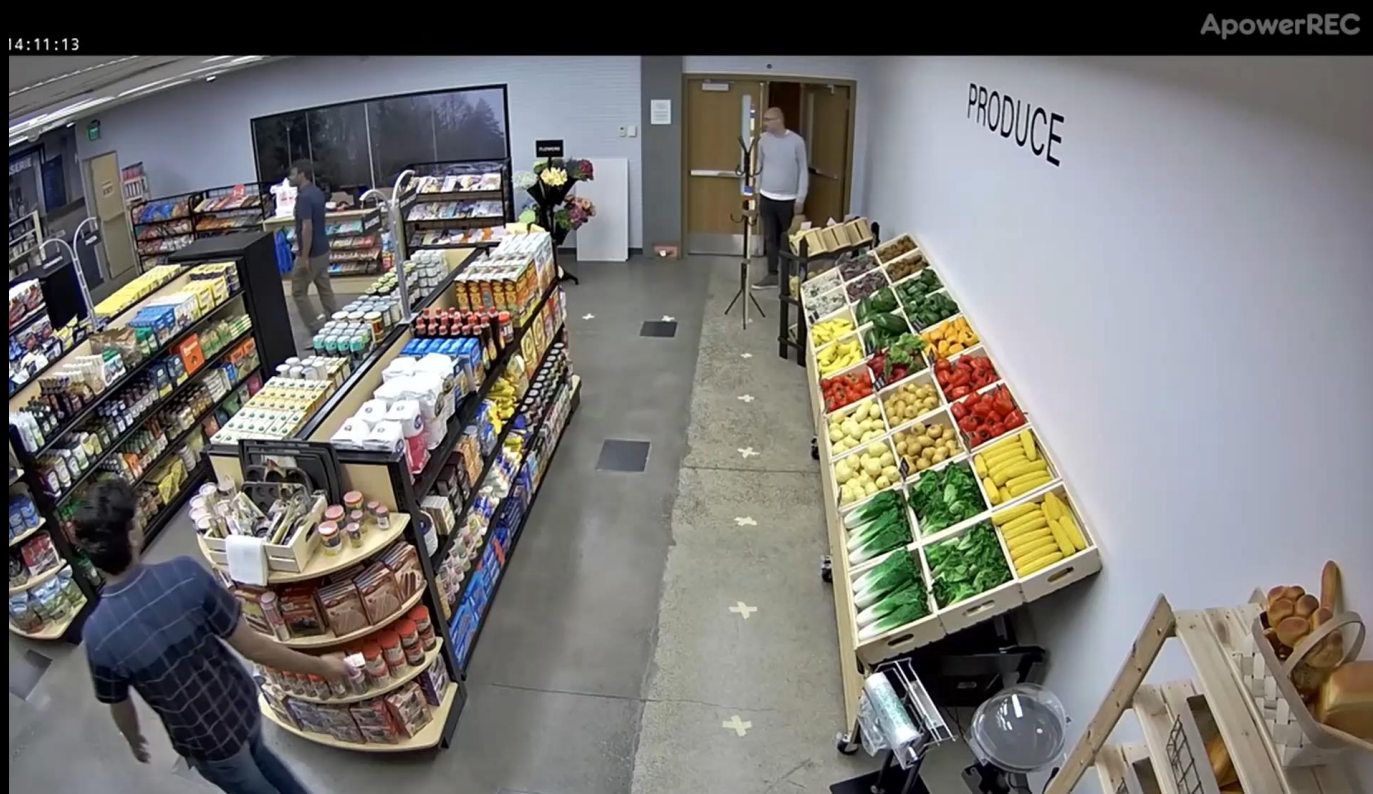




6 Spatial Understanding for Connected Store (商場空間理解)

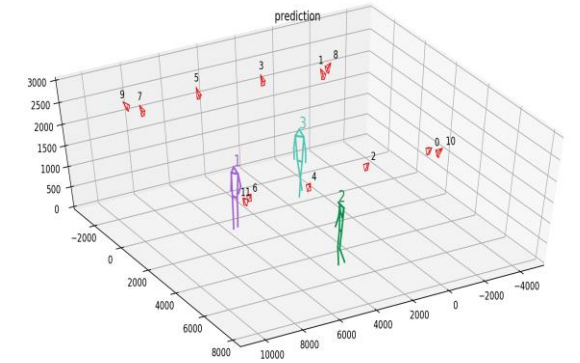
- MSRA 核心視覺技術

- ✓ 物體\人體檢測和跟蹤
- ✓ 多視角三維人體姿態估計
- ✓ 熱度圖
- ✓ 人的行為識別
- ✓ 三維重建



Multiview 3D Human Pose Estimation/Tracking

多視角三維人體姿態估計和跟蹤



The New Normal?



- The Next Normal
- The Never Normal

- Changes are constant and appearing more quickly
- Leverage AI to prepare the shift to live and work in the Metaverse!

Azure IoT & Azure Digital Twins

Learn More

Hands on demos of real world use cases:

aka.ms/IoTDemos

IoT Developer Certification

aka.ms/IoTCertification

Learn more about Azure Percept

Aka.ms/AzurePercept

Develop with Azure Digital Twins

aka.ms/ADT-MSLearn

The Internet of Things Show:

aka.ms/IoTShow

Azure AI & Microsoft Project Bonsai

Learn more

Learn more about Azure AI

[Azure.com/AI](https://azure.com/AI)

Learn more about Project Bonsai and autonomous systems

aka.ms/as

Experience Project Bonsai

Sign up for a workshop or connect with us

aka.ms/getstarted

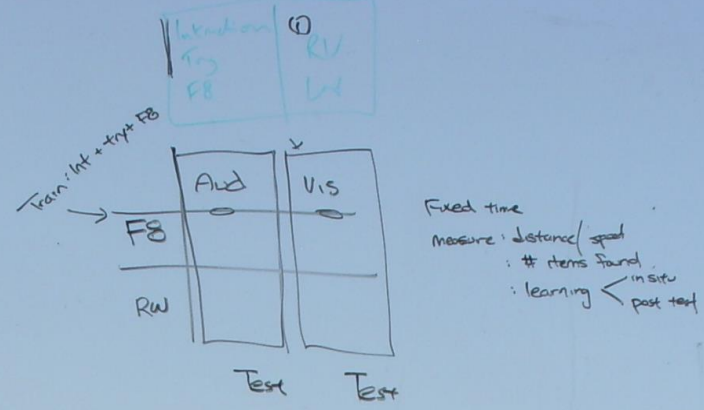
Microsoft HoloLens & Mesh

Learn more

Microsoft Mesh
www.mesh.com

HoloLens
www.hololens.com

Azure Digital Twins and Mixed Reality MS Learn Module:
aka.ms/mr-adt-mslearn



P1: Aud FB Aud RW Vis FB Vis RW | Data

P2: $\begin{matrix} \text{Aud RW} \\ \text{Vis RW} \end{matrix}$

Tell user:

Thanks!

eric.chang@microsoft.com

