

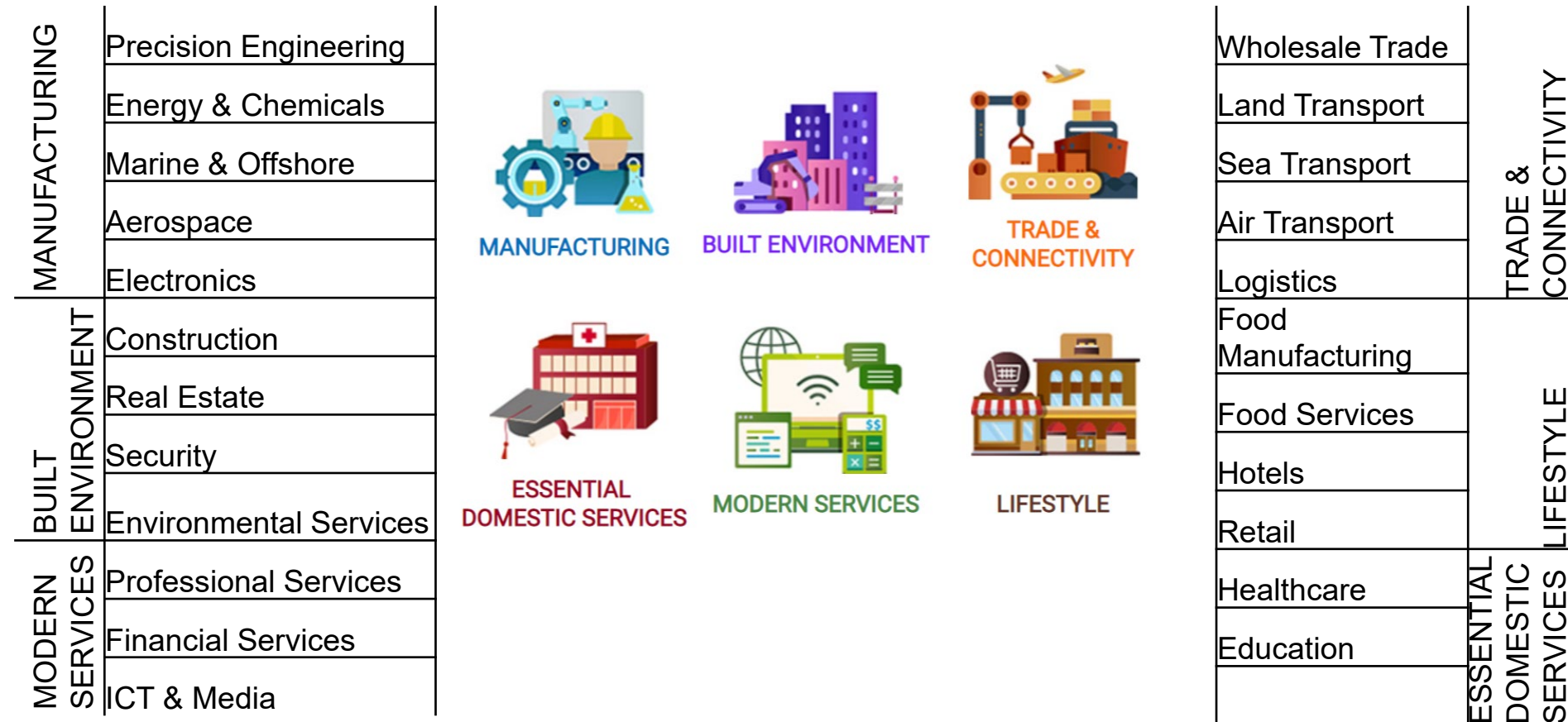


VISION SYSTEMS CASE STUDIES

Dr TIAN Jing

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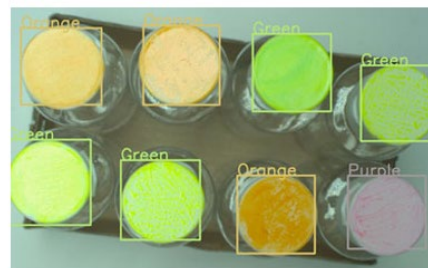
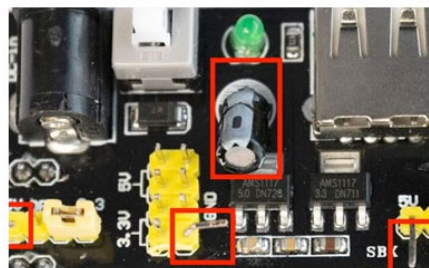
Industry transformation



Reference: <https://www.mti.gov.sg/ITMs/Overview>

MANUFACTURING

Precision Engineering
Energy & Chemicals
Marine & Offshore
Aerospace
Electronics



BUILT ENVIRONMENT

Construction
Real Estate
Security
Environmental Services

MODERN SERVICES

Professional Services
Financial Services
ICT & Media

Wholesale Trade

Land Transport

Sea Transport

Air Transport

Logistics

Food

Manufacturing

Food Services

Hotels

Retail

Healthcare

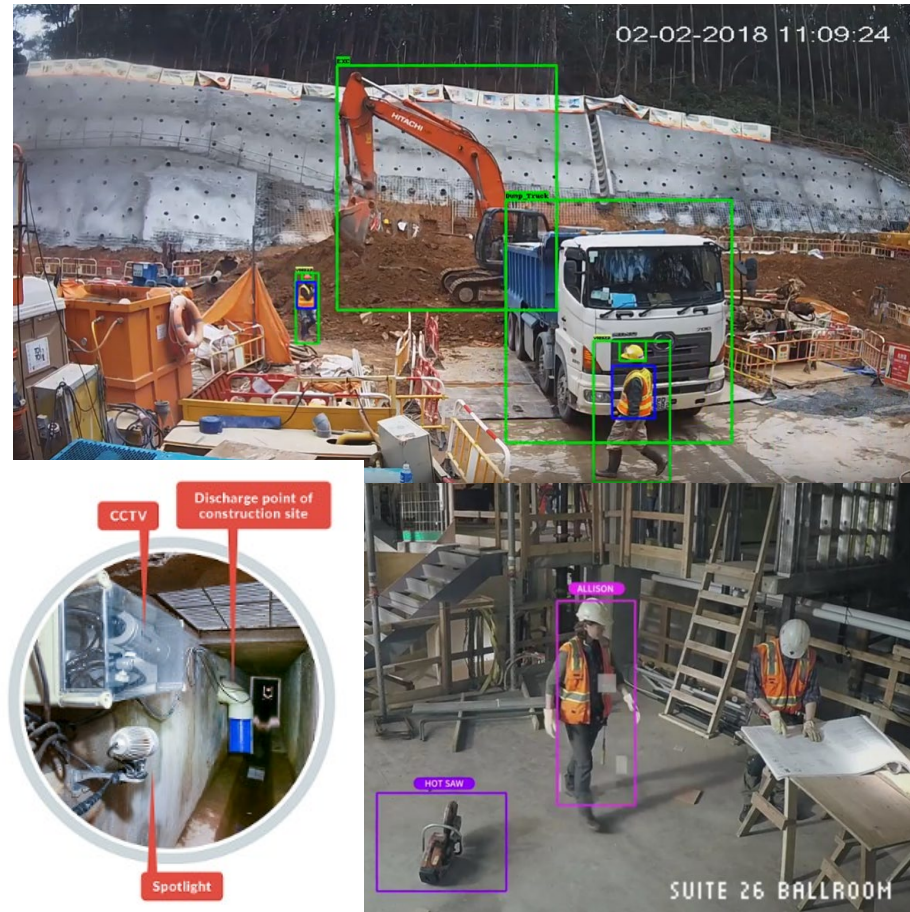
Education

TRADE & CONNECTIVITY

ESSENTIAL DOMESTIC SERVICES

Construction

MANUFACTURING	Precision Engineering
	Energy & Chemicals
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Wholesale Trade	TRADE & CONNECTIVITY
Land Transport	
Sea Transport	
Air Transport	
Logistics	
Food Manufacturing	LIFESTYLE
Food Services	
Hotels	
Retail	
Healthcare	
Education	ESSENTIAL DOMESTIC SERVICES

Reference:

- https://www.youtube.com/4HxOZCxF_mY;
- <https://marionoioso.com/2018/02/01/artificial-intelligence-computer-vision/>
- <https://www.pub.gov.sg/drainage/earthcontrolmeasures/SIDS>

MANUFACTURING	Precision Engineering	<div><h1>Zillow now uses computer vision to improve property value estimates</h1><p>KYLE WIGGERS @KYLE_L_WIGGERS JUNE 26, 2019 9:01 PM</p><div><div></div><div></div><div></div><div></div><div><div>Clean Pools</div><div>Green Pools</div></div></div></div> <td rowspan="5">TRADE & CONNECTIVITY</td> <td>Wholesale Trade</td>						TRADE & CONNECTIVITY	Wholesale Trade
	Energy & Chemicals								Land Transport
	Marine & Offshore								Sea Transport
	Aerospace								Air Transport
	Electronics								Logistics
BUILT ENVIRONMENT	Construction	<div><div></div><div></div><div></div></div> <td rowspan="4">LIFESTYLE</td> <td>Food Manufacturing</td>						LIFESTYLE	Food Manufacturing
	Real Estate								Food Services
	Security								Hotels
	Environmental Services								Retail
MODERN SERVICES	Professional Services	<div><div></div></div> <td rowspan="4">ESSENTIAL DOMESTIC SERVICES</td> <td>Healthcare</td>						ESSENTIAL DOMESTIC SERVICES	Healthcare
	Financial Services								Education
	ICT & Media								

Reference

- <https://medium.com/geoai/swimming-pool-detection-and-classification-using-deep-learning-aaf4a3a5e652>
- <https://venturebeat.com/2019/06/26/zillow-now-uses-computer-vision-to-improve-property-value-estimates/>

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Education	ESSENTIAL DOMESTIC SERVICES

Reference:

- <https://www.channelnewsasia.com/news/singapore/changi-prison-raises-tech-bar-with-automated-checks-surveillance-10455870>
- <https://www.channelnewsasia.com/news/business/new-tech-tested-at-sentosa-can-spot-unattended-objects-intruders-9135128>

Environmental services



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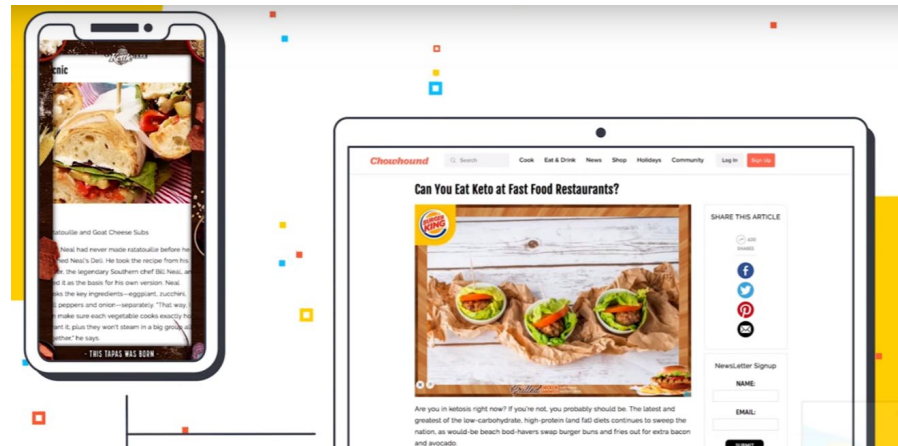
Reference: <http://theindependent.sg/nea-confirms-it-installed-cameras-in-hdb-housing-estates-not-to-detect-smoking-but-for-high-rise-littering>; A Computer Vision System to Localize and Classify Wastes on the Streets, <https://arxiv.org/abs/1710.11374>

Financial services

MANUFACTURING	Precision Engineering		Wholesale Trade	TRADE & CONNECTIVITY
	Energy & Chemicals		Land Transport	
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	Aerospace		Air Transport	
	Electronics		Logistics	
BUILT ENVIRONMENT	Construction		Food Manufacturing	LIFESTYLE
	Real Estate		Food Services	
	Security		Hotels	
	Environmental Services		Retail	
	Professional Services		Healthcare	
MODERN SERVICES	Financial Services		Education	ESSENTIAL DOMESTIC SERVICES
	ICT & Media			

Reference: <https://www.scmp.com/business/banking-finance/article/2117469/big-data-could-help-bring-micro-lending-millions-left-out>

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Reference: <http://www.moviebook.cn/product/videoyi>; <http://www.gumgum.com>



Transport and logistics

Changi Airport testing facial recognition systems to find late passengers

MANUFACTURING

Precision Engineering

Energy & Chemicals

Marine & Offshore

Aerospace

Electronics

BUILT ENVIRONMENT

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Real Estate

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When Terminal 4 opens later this year, most travellers will be able to bypass manned counters and opt for self-service options from check-in to boarding.

1 Enter the booking reference or scan passport (depending on the airline) to retrieve the flight booking, select seat (where available) and print boarding pass and bag tags).



2 A photo of the passenger is captured and matched against the photo in the scanned passport before the luggage is accepted. Sensors will alert airport staff if bag is oversized, for example.



3 Immigration clearance comprises a dual facial and thumbprint biometric recognition system. The passenger's photo is captured and matched against the one in the passport.



4 At the boarding gate, passengers need to scan their boarding pass and authenticate their identity by taking a final photo. The facial recognition system matches this photo against the one taken earlier.

ST PHOTOS: DESMOND FOO, OLIVIA CHANG STRAITS TIMES GRAPHICS



Reference:

- <https://blog.econocom.com/en/blog/retail-and-logistics-a-revolution-in-the-supply-chain/>;
- <https://www.youtube.com/watch?v=6Jm6d03GuHo>;

Wholesale Trade

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LIFESTYLE

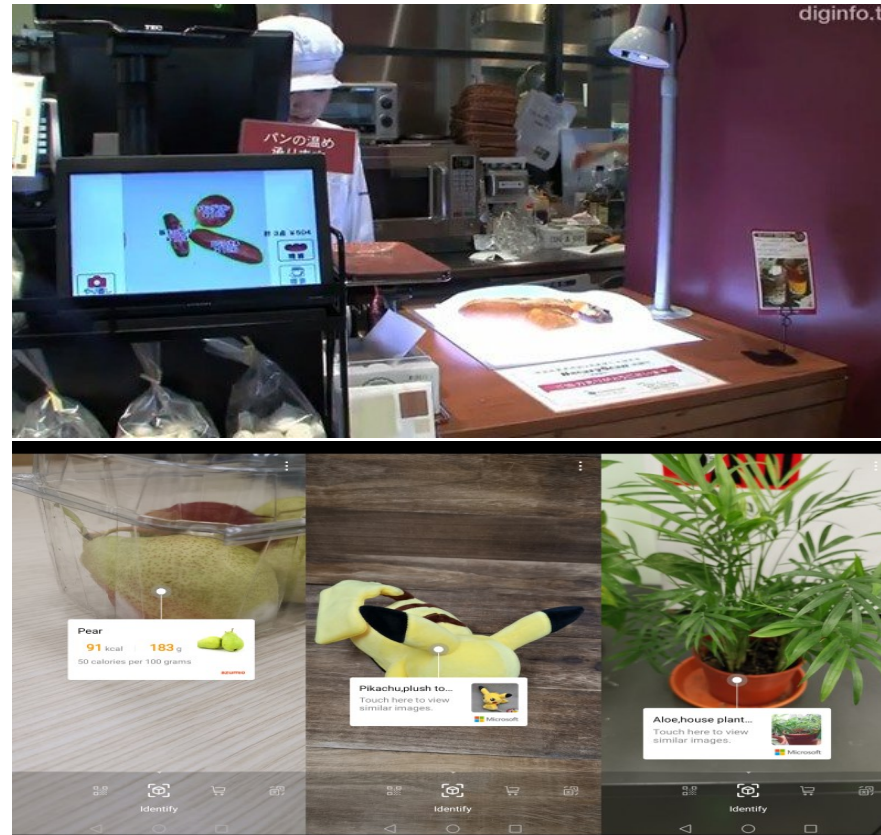
ESSENTIAL DOMESTIC SERVICES

Reference:

- <https://www.businesstimes.com.sg/transport/changi-airport-testing-facial-recognition-systems-to-find-late-passengers>

Food services

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Photo: <https://www.engadget.com/2012/07/27/visual-recognition-bakery-checkout;>
<https://www.hardwarezone.com.sg/feature-huawei-mate-20-hivision-aiobject-recognition-feature-preview>

Hotels and retail

computer vision to help commercial
kitchens cut food waste

PAUL SAWERS @PSAWERS MARCH 21, 2019 5:00 PM



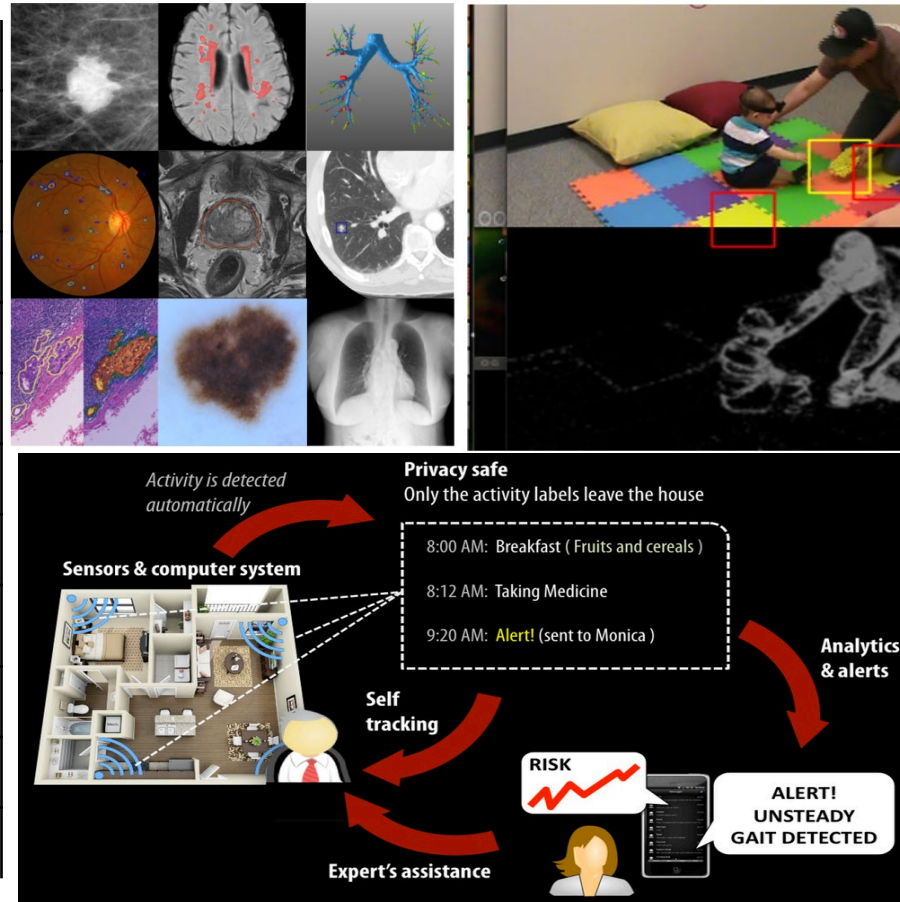
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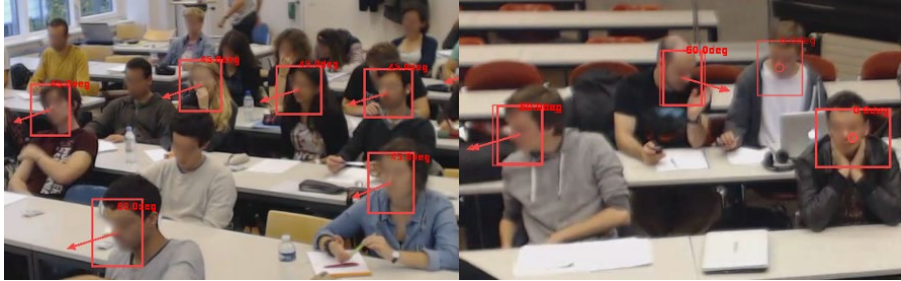

- <https://www.straitstimes.com/tech/smart-kitchen-system-checks-food-wastage;>
- https://www.lsa-conso.fr/mediatheque/2/9/6/000257692_87.jpg

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Photo: <http://stanfordhealth.weebly.com>; <https://arxiv.org/pdf/1702.05747.pdf>

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Reference: <https://chili.epfl.ch/page-92073-en-html/page-92240-en-html/page-126025-en-html/>; <https://mathpix.com/>

Thank You.

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