HKUST Knowledge Transfer
Create Impact through Innovation and Entrepreneurship Development

THE HONG KONG
UNIVERSITY OF SCIENCE
AND TECHNOLOGY

Dr SC Kim, Acting AVP-KT(sckim@ust.hk)
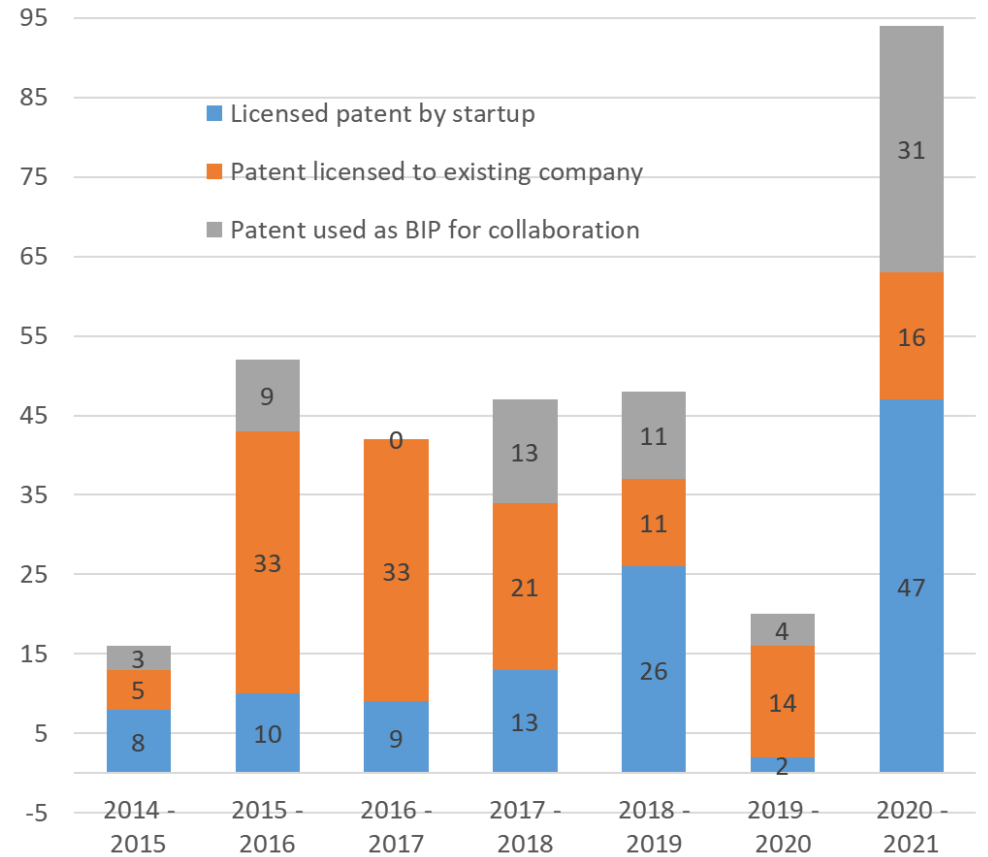Mr Samuel Wong, TTC Cluster Head (ttsamuel@ust.hk)

Comprehensive Knowledge Transfer Framework in HKUST

Faculty

University Research

176 New Inventions

Invention

Knowledge Transfer Activities

IP Management/Tech Incubation/Startup Incubation/Industry Engagement/Technology Marketing

Technology Licensing
117 Active License Agreements *

1,759 Active Patents/Patent Applications

DeepTech Startup Incubation
60 Spin-offs with HKUST Technologies *

Industry Engagement and Collaboration
271 companies with 807 projects for last 5 years *

Technology/Entrepreneurship courses, Funding, events, competitions, training, design thinking, Hackathon, Exhibition

Entrepreneurship Development
467 startups incubated for last 5 years, around 25% of student engaged

Industry

IMPACT
- New Products / Services in the Market to Benefit for Society
- Startup company to enhance GDP and Job creation (7 Unicorns from HKUST)
- Change policy and regulations

Strategic IP Management improved IP Utilization

Number of Patent Application over the years
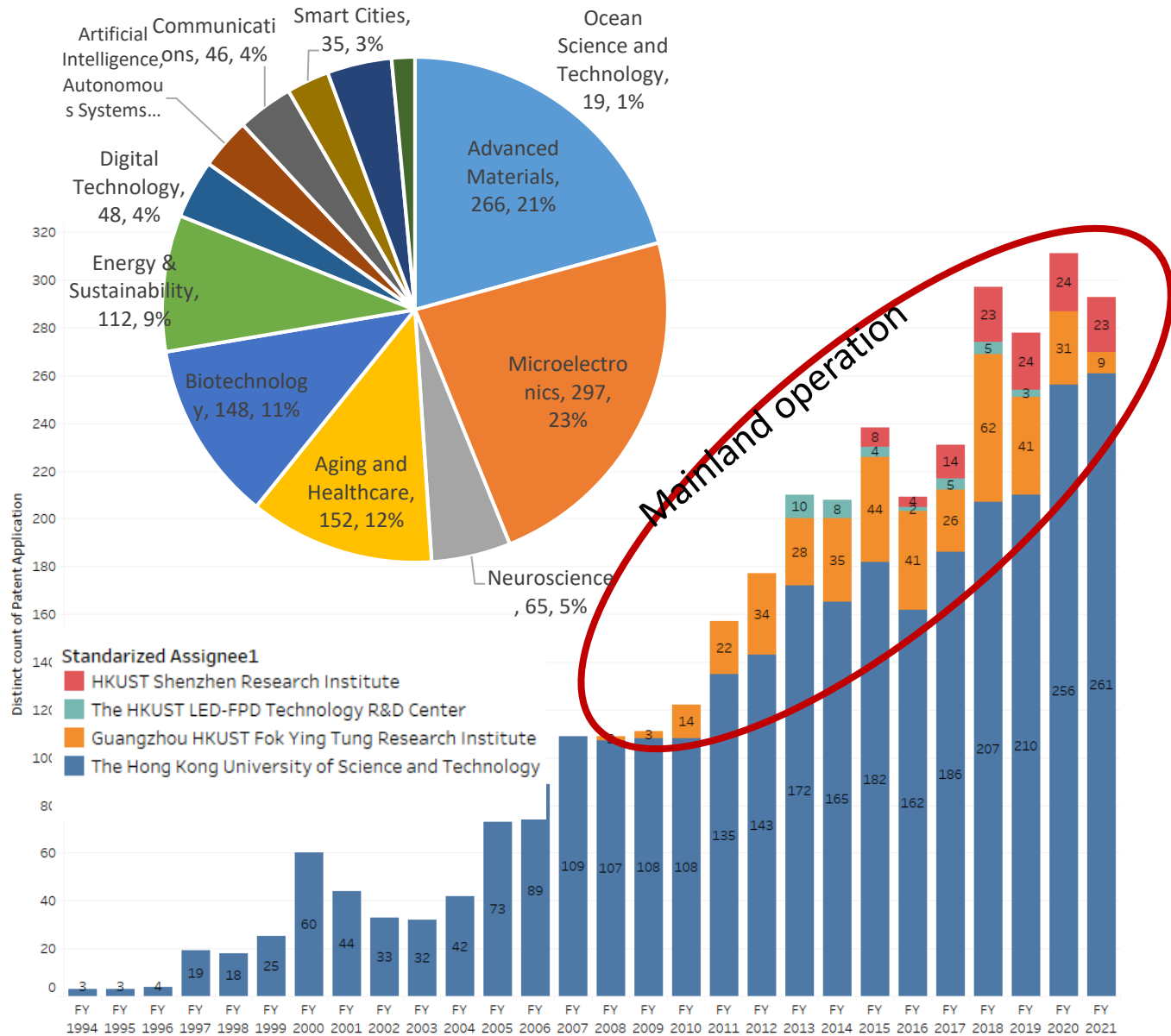
Number of Patent Utilized

- Licensed patent by startup
- Patent licensed to existing company
- Patent used as BIP for collaboration

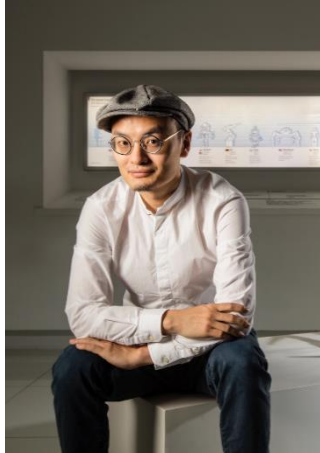Note: 3 patents were multiply used in 2020/21

TTC provided IP landscape to key project teams to create better Innovation outcome

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7 Unicorns with HKUST DNA

dji

Mr Frank Wang,
Founder, CEO and CTO

Master of Philosophy,
Electronic and
Computer
Engineering

WeLab Bank

Mr Tat Lee,
Chief Executive and
Executive Director

Bachelor of
Engineering, Computer
Science

SMARTSENS 思 特 威 科 技

Dr Chen Xu,
Founder, Chief
Executive Officer

PhD, Mphil,
Electronic
Engineering

GOOGOLTECH

Chairman and Co-
founder

CiDi

Co-founder

Professor Zexiang Li
Department of
Electronic and Computer
Engineering

4Paradigm 第四范式
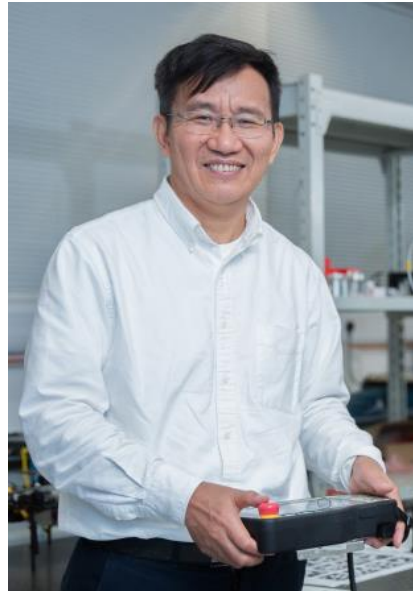
Professor Qiang
Yang, Co-founder

Chair Professor at
Department of
Computer Science
and Engineering

SmartMore

Professor Jiaya Jia,
Founder and Chairman

Doctor of Philosophy,
Computer Vision

There are 18 Unicorns from Hong Kong SAR @2021

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HKUST's Leadership in Entrepreneurship Development

Next Unicorns: Valued > RMB1b
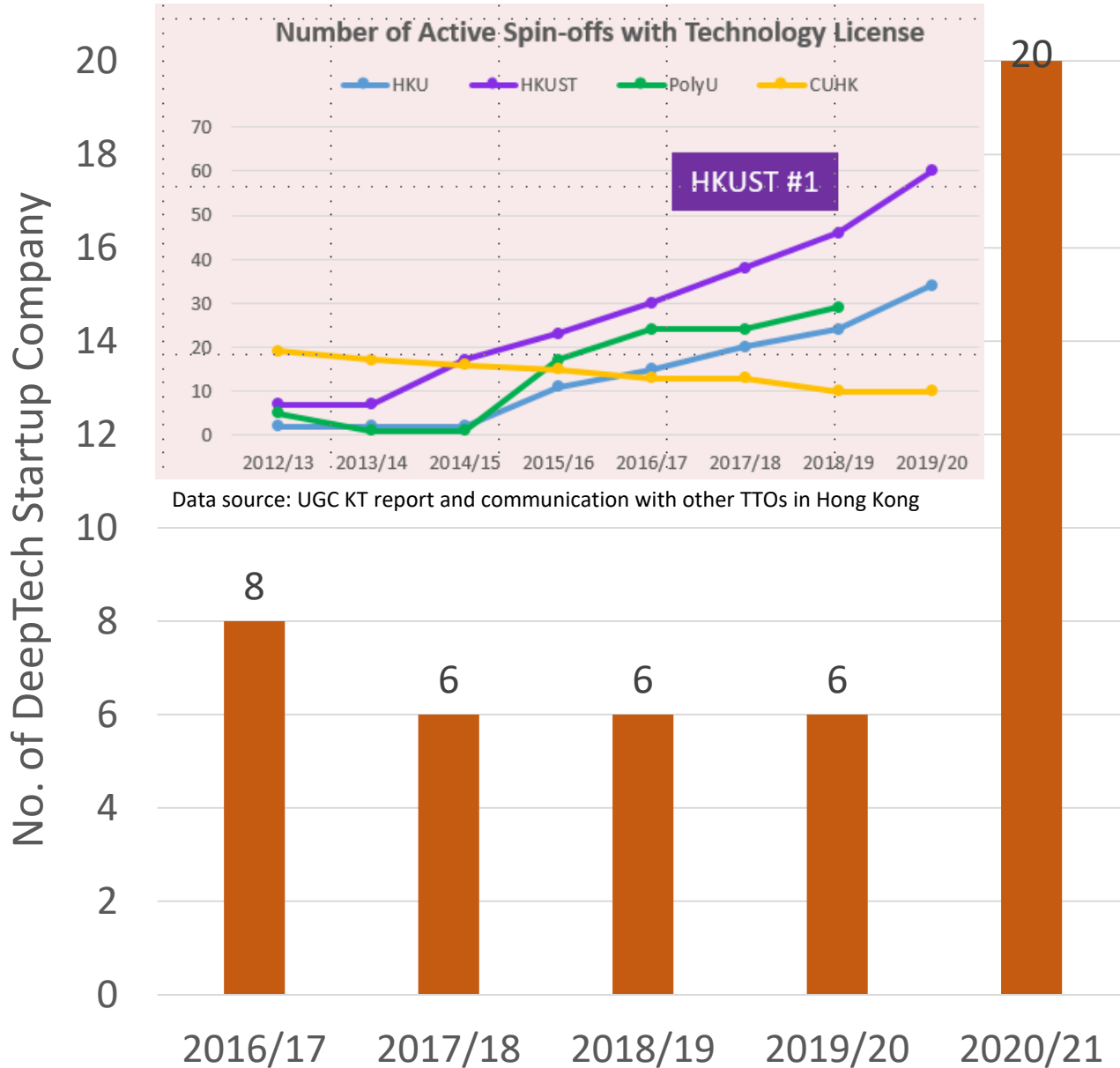
Next Surprise

Growing Potentials

- 90 new startups annually
- 20 DeepTech startup with HKUST Technology Licenses @ 2021
- 1,600 Active startups @ 2021

Strong DeepTech Startup Growth in 2020/21

Number of Active Spin-offs with Technology License
— HKU — HKUST — PolyU — CUHK
HKUST #1

Data source: UGC KT report and communication with other TTOs in Hong Kong

(Bar chart — No. of DeepTech Startup Company)
- 2016/17: 8
- 2017/18: 6
- 2018/19: 6
- 2019/20: 6
- 2020/21: 20

1. Record high 23 new license @2021 license and 20 DeepTech Startup with HKUST license.
   - UC Berkeley has 15 @2018, MIT 24 @ 2021
2. Strategic Technology Incubation and new initiatives
   - Bridge Gap Fund
   - Techship program
   - TSSSU/Entrepreneurship Fund
   - IP and Industry Landscaping Analysis

Number of Economically Active Start-ups and Spin-offs
— HKU — HKUST — PolyU — CUHK
HKUST #1
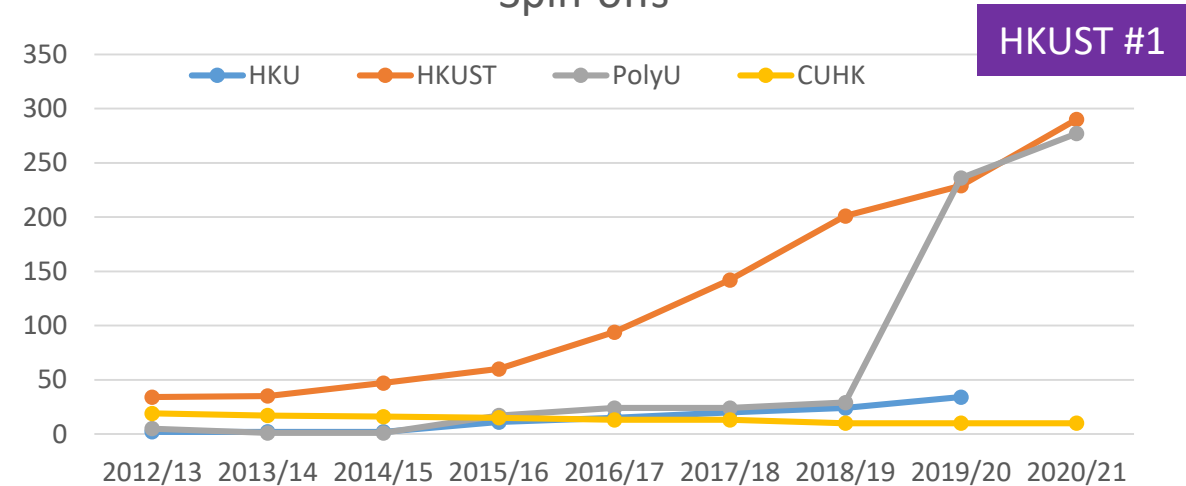
Comprehensive support for Entrepreneurship Development

Entrepreneurship Education

M.Sc. in Technology, Leadership and Entrepreneurship
2 cohorts, (19+35)

Minor Program in Entrepreneurship

The Minor Program in Entrepreneurship is jointly offered by the School of Science, School of Engineering and the School of Business & Management. This Minor Program is designed mainly for engineering, business and science students, but is also open to all students to apply.

Course Code	Course Title
ENTR1001	Entrepreneurship 1001: Building Your Own Future
ENTR2010	Entrepreneurship Mentorship and Readings

# of students taking ENTR courses (>150/year)

Events, Competitions, Incubation Programs, DeepTech Development

- 129 events with 7,675 students participated in 2020/21
- 3 Champions and 3 Awards in City I&T Grand Challenge 2021
- HKUST-GBA Entrepreneurship Fund: HKD9m
- TECH-ship funding: HKD5m
- Bridge Gap Fund: HKD5m
- Entrepreneurship center funding: ~ HKD5m

Investment/Funding to Startup companies

HKD8million, 20 companies per year

HKD50million, 10 portfolio companies

Co-investment partners with HKD7billion investment pool

Entrepreneurship Facilities and Funding Support

Startup Zone

Entrepreneurship Program @ Startup Zone
- 10 rooms
- Co-working space
- Hosts 20 companies
- Basic office management services
- DeepTech Incubation program (in preparation)

The BASE: Student Activity hub

Category	Name
Technology Incubation and Test bedding	Bridge Gap Fund (BGF)
	HKUST-Kaisa Joint Research Institute
	HKUST Collaborative Innovation Center
	Sustainable Smart Campus Initiatives
Innovation and Entrepreneurship Development	Entrepreneurship Development Fund
	Hackathons
	The Innovation, Creativity & Entrepreneurship Scholarship
	Sustainable Smart Campus Seed Grant
	Chan Dang Social Entrepreneurship Fund
Funding for Startup Team	One Million Dollar Entrepreneurship
	Dream Builder Incubation Programme
	Techship Program, The Lo Kwee Seong Technopreneurship (Tech-Ship) Fund
	HKUST Greater Bay Area Youth Entrepreneurship Fund Program
Funding for startup company	Technology Start-up Support Scheme for Universities (TSSSU)
	Entrepreneurship-fund

Strong Industry Engagement with various mode

Joint Labs

Joint Research Institutes

HKUST-Bright Dream Robotics
Joint Research Institute

HKUST-Kaisa Joint Research Institute

- Total 47 projects approved with HK$96M by Aug 2021
- Key areas: construction robotics, advanced materials, IoT, Fintech and Healthcare
- Student internship opportunities with industry partners

Project based collaboration
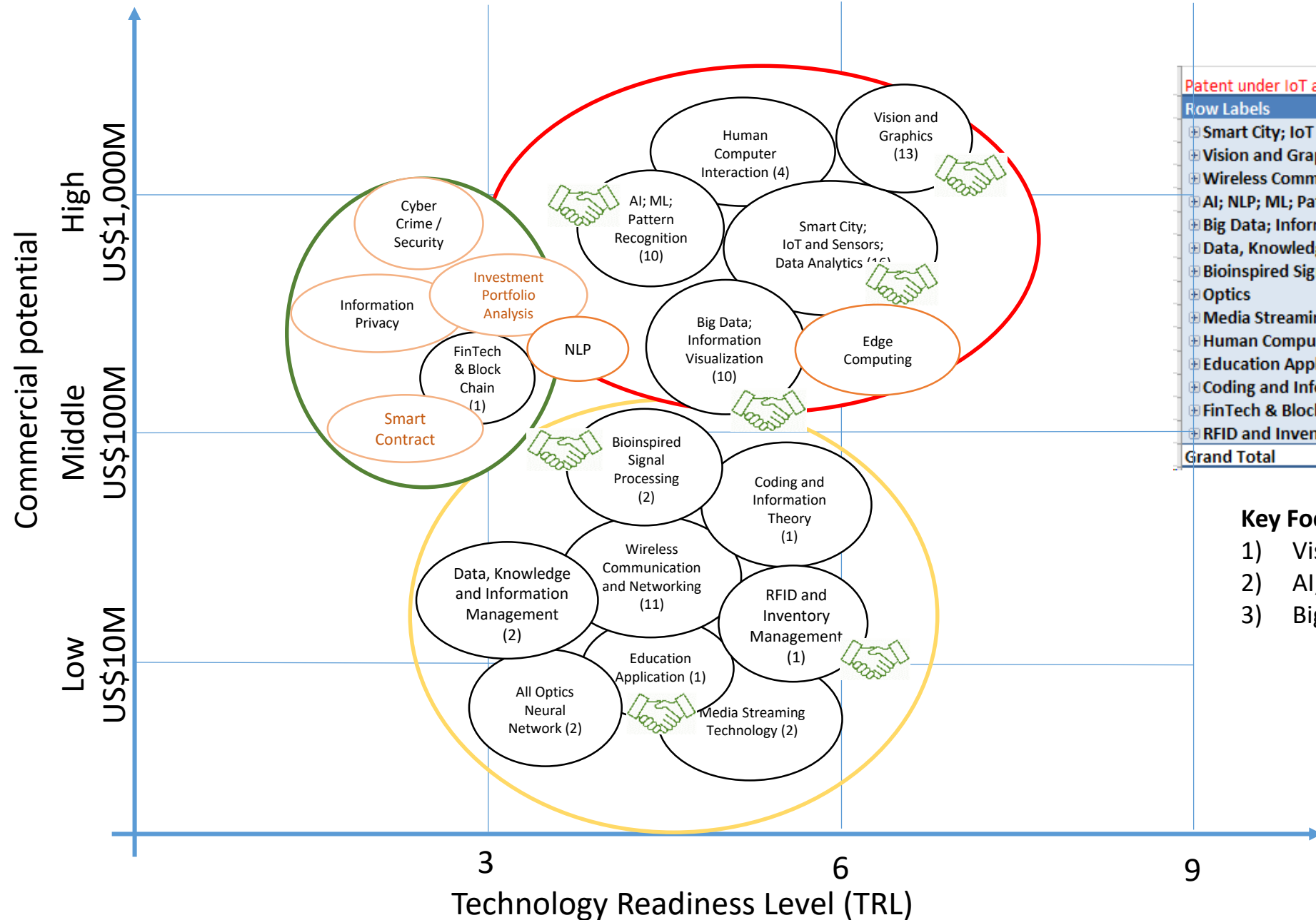- Contract Research
- Sponsored Research

Service and Consulting Projects

Joint Application to ITF Funding
- ITSP, PRP, PSTS

Industry Contract Research

- HKUST conducted **807 Projects with 271 companies** in 2015/16 ~ 2020/21
- It enhanced University's research relevance with Industry and contributed companies' product development

Technology Portfolio (ICT, AI and Fintech Technology)

Commercial potential (vertical axis): High US$1,000M — Middle US$100M — Low US$10M

Technology Readiness Level (TRL) (horizontal axis): 3, 6, 9

Bubbles:
- Cyber Crime / Security
- Human Computer Interaction (4)
- Vision and Graphics (13)
- AI; ML; Pattern Recognition (10)
- Smart City; IoT and Sensors; Data Analytics (16)
- Information Privacy
- Investment Portfolio Analysis
- FinTech & Block Chain (1)
- NLP
- Big Data; Information Visualization (10)
- Edge Computing
- Smart Contract
- Bioinspired Signal Processing (2)
- Coding and Information Theory (1)
- Wireless Communication and Networking (11)
- Data, Knowledge and Information Management (2)
- RFID and Inventory Management (1)
- Education Application (1)
- All Optics Neural Network (2)
- Media Streaming Technology (2)

Patent under IoT and Communication (filing date after 2010)

Row Labels	Count of Key Inventor Name2
Smart City; IoT and Sensors; Data Analytics	16
Vision and Graphics	13
Wireless Communication and Networking	11
AI; NLP; ML; Pattern Recognition	10
Big Data; Information Visualization	10
Data, Knowledge and Information Management	2
Bioinspired Signal Processing	2
Optics	2
Media Streaming Technology	2
Human Computer Interaction	2
Education Application	1
Coding and Information Theory	1
FinTech & Blockchain	1
RFID and Inventory Management	1
Grand Total	74

Key Focused Area:
1) Vision and Graphics
2) AI; Machine Learning; Pattern Recognition
3) Big Data; Information Visualization

Legend:
- Artificial Intelligent (AI)
- Fintech
- ICT
- Future Expansion on Patent

Profile of Patents in ICT, AI and Fintech Technology

ICT & Software related Patents		
1	No. of Patents	74
2	No. of Patents Licensed	16
3	Top 3 Contributor in ICT & Software Patents	
-	Prof CHAN Shueng Han Gary (陳雙幸)	
-	Prof QUAN Long (權龍)	
-	Prof QU Huamin (屈華民)	

Row Labels	CIVL	CSE	ECE	FYTRI	IEDA	IPO	MAE	MATH	OP	PHYS	Grand Total
⊞ Smart City; IoT and Sensors; Data Analytics		14		2							16
⊞ Vision and Graphics	1	8							4		13
⊞ Wireless Communication and Networking		11									11
⊞ AI; NLP; ML; Pattern Recognition	2	3	4				1				10
⊞ Big Data; Information Visualization		10									10
⊞ Data, Knowledge and Information Management		2									2
⊞ Bioinspired Signal Processing					2						2
⊞ Optics									2		2
⊞ Media Streaming Technology		2									2
⊞ Human Computer Interaction		2									2
⊞ Education Application						1					1
⊞ Coding and Information Theory								1			1
⊞ FinTech & Blockchain	1										1
⊞ RFID and Inventory Management							1				1
Grand Total	4	52	4	2	2	1	2	1	4	2	74

Patent under IoT and Communication (filing date after 2010)

↑(7)
↑(3)

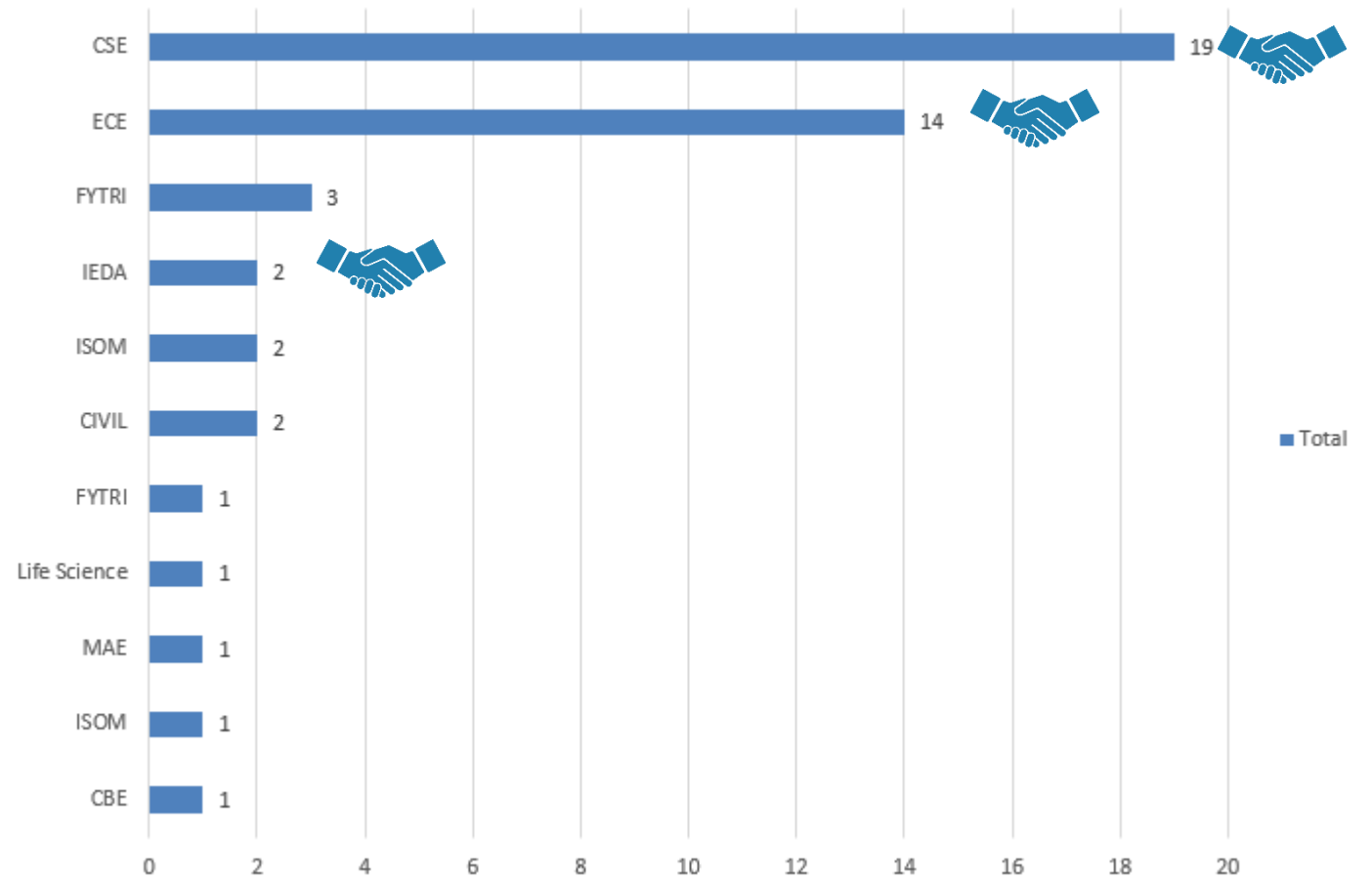AI / Big Data related patents
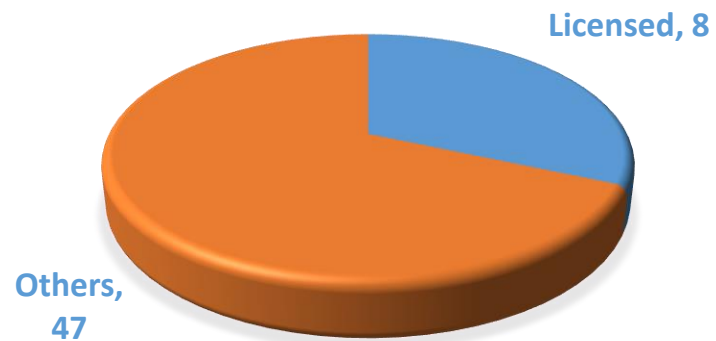
New
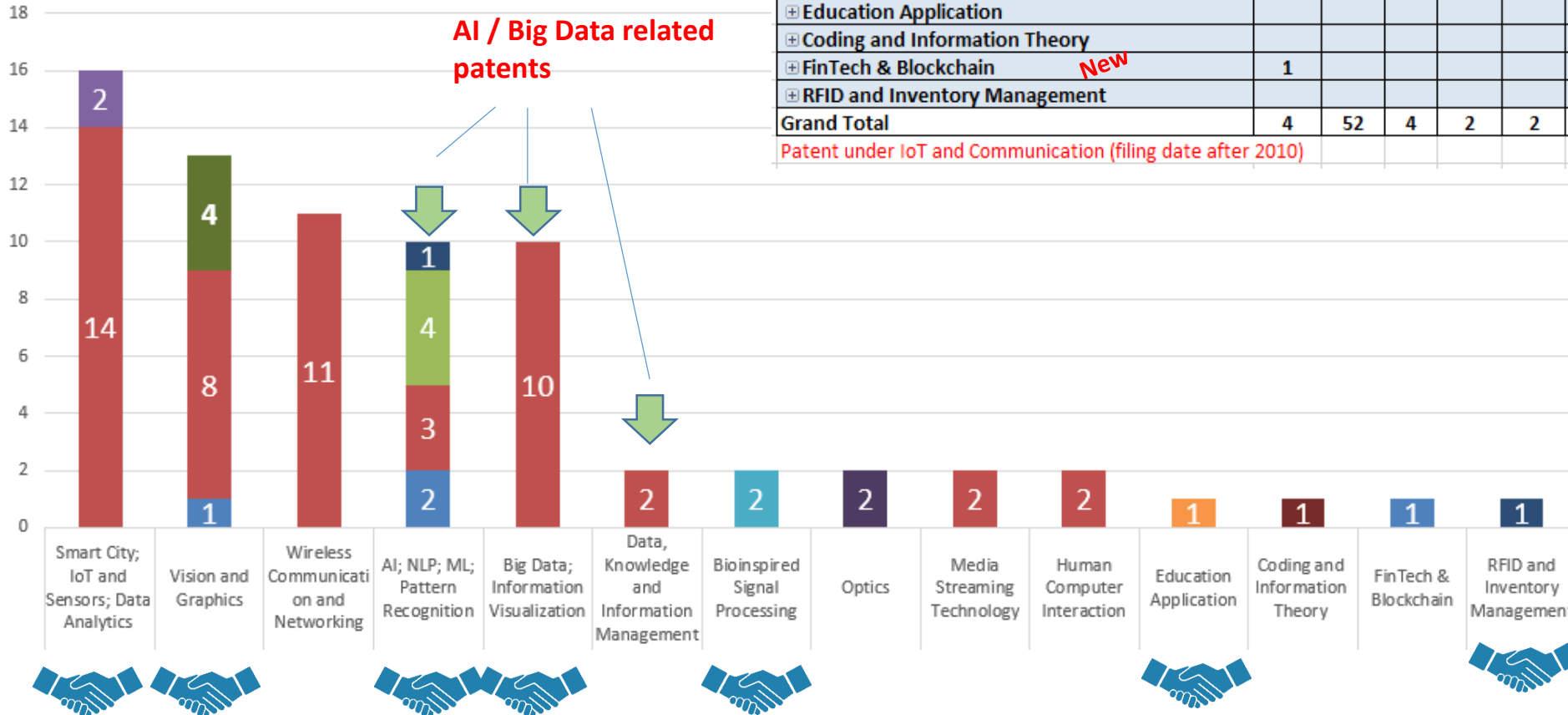
Legend

- PHYS
- OP
- MATH
- MAE
- IPO
- IEDA
- FYTRI
- ECE
- CSE
- CIVL

Profile of Software Disclosure & Licensing

ICT & Software related Patents		
1	No. of Software Disclosure Form	47
2	No. of Patents Licensed	8
3	Top 3 Contributor in Software Disclosure	
-	Prof CHAN Shueng Han Gary	
-	Prof Ming Liu	
-	Dr. Min Gao	

SOFTWARE DISCLOSURE USAGE (17%)

Licensed, 8

Others, 47

Department vs Number of SDF - Total 47

Department	Value
CSE	19
ECE	14
FYTRI	3
IEDA	2
ISOM	2
CIVIL	2
FYTRI	1
Life Science	1
MAE	1
ISOM	1
CBE	1

■ Total

HKUST Express Licensing Platform

https://exp-license.hkust.edu.hk/

- **Commercialization of Software Research Output**
- **Source code or Compiled Software**
- **IP Solely owned by HKUST**
- **License by industry for product development**

Create Impact through Innovation and Entrepreneurship

Thank you !

Useful links

- KT Hub https://kt.hkust.edu.hk/
- TTC Featured Technologies https://ttc.ust.hk/index.php?specpage=feature
- TTC E-Fund https://e-fund.hkust.edu.hk/en/index
- Entrepreneurship Center https://www.ec.ust.hk/node/416
- SUSTAINABLE SMART CAMPUS AS A LIVING LAB https://ssc.hkust.edu.hk/
- HKUST Central Research Facilities https://vprd.ust.hk/Research-Infrastructure/Central-Research-Facilities
- RESEARCH INSTITUTES https://vprd.ust.hk/Research-Infrastructure/Research-Institutes
- Funding https://kt.hkust.edu.hk/hong-kong