年度報告

Annual Report

2025

澳門城市大學
Universidade da Cidade de Macau
City University of Macau

FDS
數據科學學院
Faculty of Data Science

Welcome Message

In the year 2025, the Faculty of Data Science achieved remarkable accomplishments. This year was not only a fruitful period for scientific research and innovation but also a significant milestone in teaching quality and talent cultivation. On behalf of the faculty's management, I extend my heartfelt gratitude to all faculty and staff, as well as to colleagues, partners, and members of the broader community who have long supported the development of the faculty.

In the field of scientific research, the faculty made significant progress in 2025. The quantity and quality of academic papers continued to improve, with a total of 167 papers indexed in JCR Q1 journals. The faculty successfully secured multiple high-level research projects, with total funding reaching a record amount of approximately MOP 23,494,938. The research covers several cutting-edge areas such as cybersecurity, data analysis, artificial intelligence, and its medical applications, reflecting the faculty's research strength and influence.

In teaching, we welcomed the third-year students of the joint Bachelor's program in Data Science and Big Data Technology with Minzu University of China, and celebrated the first graduates of our Master's program in Computer Science. Our undergraduate, master's, and doctoral programs continue to expand, with our new AI programs successfully accredited. Our students excelled in competitions, winning the Grand Prize in the 10th Greater Bay Area IT Application System Development Competition and a gold medal in the China International College Students' Innovation Competition.

Looking ahead to 2026 and beyond, we will continue to uphold the mission of "Academic Innovation, Serving Society." We will deepen interdisciplinary collaboration, align with national and regional strategies, and strengthen research in data science, AI, and cybersecurity. We are committed to enhancing our curriculum, improving teaching quality, and fostering international exchange to attract outstanding talents worldwide.

2025 was a year of rapid growth for the faculty and a new starting point. In the future, the faculty will continue to be driven by innovation, pursue excellence, and strive to become a significant force in the field of data science both domestically and internationally. Once again, thank you all for your support and trust! Let us join hands and move forward together to embrace an even brighter future!

Contents

Introduction to the Faculty of Data Science

Overview of the number of students and faculty members in the faculty in 2025

In 2025, the Faculty of Data Science achieved significant progress and breakthroughs in multiple areas, particularly demonstrating outstanding performance in academic development, faculty and student scale, and research. By the end of the year, the overall scale of the Faculty further expanded, with the total number of students reaching 1,715 and the number of full-time faculty increasing to 62, including 56 full-time academic staff and 6 administrative staff. The faculty played a key role in cultivating high-quality data science talents, promoting innovative research outcomes, and providing high-quality academic support. The distribution of the faculty's programs and student numbers is detailed in the table below:

Table 1. Overview of Faculty Programs

FDS Program Overview						
Program Name	**Number of students**					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Deferral**	**Total**
Bachelor of Science in Intelligent Technology and Services	138	168	162	173	10	651
Bachelor of Science in Computer Science	79	40	43	-	-	162
Bachelor of Science in Data Science and Big Data Technology (co-organized with Minzu University of China)	113	114	119	-	-	346
Master of Data Science	78	78	-	-	12	168
Master of Computer Science	55	57	-	-	4	116
Doctor of Data Science	37	37	38	-	52	164
Doctor of Computer Science	38	38	32	-	-	108
Total number of students	**538**	**532**	**394**	**173**	**78**	**1715**

Among them, doctoral students account for 15.86%, master's students account for 16.56%, and undergraduate students account for 67.64%. For specific details, please refer to Table 2.

Table 2. Student levels

	PH.D.	**Masters**	**Bachelors**	**Total**
Number of students	272	284	1159	1701
Percentage	15.86%	16.56%	67.64%	100%

Faculty of Data Science continues to optimize its curriculum and disciplinary direction committed to providing students with a cutting-edge, challenging, and innovative academic environment, thereby laying a solid foundation for cultivating high-quality talents in the field of data science. As of the end of 2025, the Faculty of Data Science has a total of 56 full-time academic staff and 6 administrative staff. Among the full-time academic staff, there are 4 full professors, 8 associate professors, 44 assistant professors, 1 lecturer, and 1 distinguished professor. The academic team members have diverse backgrounds, covering multiple cutting-edge fields such as data science, computer science, information security, and artificial intelligence, enabling them to provide high-level teaching and research guidance to students.

In addition, to meet the needs of the faculty's future development, the faculty is actively advancing its talent recruitment plan. To support teaching and research work in the 2026 academic year, the faculty plans to recruit 12 new academic staff members, who will officially join the Faculty in August 2026, further enhancing the faculty's teaching and research capabilities. At that time, the total number of full-time academic staff in the faculty will exceed 70. With the continuous expansion of the faculty team, the faculty will more effectively promote the progress of academic research, provide students with richer and more diverse academic experiences, and facilitate academic innovation and the transformation of research outcomes.

Overview of Faculty Papers Published in 2025

As shown in Table 3, the Faculty of Data Science published a total of 353 papers in 2025. Among them, 207 papers were indexed in SCI, with 167 published in JCR Q1 journals. These figures demonstrate the faculty's remarkable achievements in academic research and highlight its continuous improvement in both the quantity and quality of publications, reflecting the efforts made by the faculty in promoting research innovation and enhancing academic influence. These accomplishments not only strengthen the faculty's academic standing but also provide students with more opportunities for learning and research.

Table 3. Publication numbers from 2022 to 2025

	Q1	Q2-Q4	EI	Monograph	CSSCI Core Journals	General Journals	ESCI	SCI Indexed	Total
2022	41	21	14	1	1	-	2	62	80
2023	52	12	19	5	-	2	1	64	91
2024	130	34	85	1	6	6	6	164	268
2025	167	40	137	1	2	2	4	207	353

Teaching and Learning

In 2025, the Faculty of Data Science has achieved remarkable results in teaching. Starting from the 2023 academic year, the bachelor's, master's, and doctoral degree programs in computer science offered by the faculty have fully commenced enrollment and teaching activities, with the master's program in computer science welcoming its first cohort of graduates. These programs not only perfected the faculty's academic system but also provided students with diverse learning pathways, helping them deepen their professional capabilities in the field of data science. In addition, the faculty's existing programs have successfully passed professional accreditation evaluations, an achievement that further validates the faculty's rigorous pursuit and outstanding performance in teaching quality and academic standards. These accreditations not only enhance the faculty's reputation but also add greater value to its degrees, strengthening graduates' competitiveness in the job market. With the continuous refinement of teaching quality, the Faculty of Data Science is steadily advancing toward becoming a leading educational institution in the industry.

Current status of faculty programs and planning of new programs

As of the end of 2025, the Faculty of Data Science (FDS) will have the following seven programs:

Table 4. Faculty programs

Degree Category	Degree Name
Bachelor	Bachelor of Science in Intelligent Technology and Services
	Bachelor of Computer Science
	Bachelor of Science in Data Science and Big Data Technology (co-organized with Minzu University of China)
Master	Master of Data Science
	Master of Computer Science
Doctorate	Doctor of Data Science
	Doctor of Computer Science

In 2025, the Faculty of Data Science achieved comprehensive and significant results in teaching development. The "Bachelor of Artificial Intelligence," "Master of Artificial Intelligence," and "Doctor of Artificial Intelligence" have successfully obtained accreditation from the Hong Kong Council for Accreditation of Academic and Vocational Qualifications. In addition, the faculty is actively applying for the "Bachelor's Degree Program in Electronic and Computer Engineering," "Master's Degree Program in Electronic and Computer Engineering," and "Doctoral Degree Program in Electronic and Computer Engineering." These program applications not only reflect the faculty's commitment to educational quality but also demonstrate its pursuit of depth and breadth in disciplinary development.

In addition to applying for new programs independently, the faculty is also actively collaborating with other faculties within the university to jointly apply for new programs. The jointly applied programs with other faculties of the university (including those currently under application and those planned for application) include: the "Master's Degree Program in Smart Elderly Care and Health Management" jointly applied with the Faculty of Greater Health, aimed at cultivating professionals who utilize cutting-edge intelligent technologies to improve health services; the "Master of Science in Management Analytics" jointly applied with the Business Faculty, dedicated to developing business elites with data analytics capabilities; the "Master's Degree Program in Smart Interaction Design" and "Doctoral Degree Program in Smart Interaction Design" jointly applied with the Faculty of Innovative Design, which integrate urban design with intelligent technologies to provide talent support for smart city construction; and the "Master's Degree Program in Digital Applied Linguistics" jointly applied with the Faculty of Humanities and Social Sciences, applying data science technologies to the field of social sciences to introduce new perspectives and methods to humanities and social sciences research.

The faculty has demonstrated remarkable enthusiasm and innovative spirit in program application efforts, while actively promoting interdisciplinary cooperation and exchange within the academic community. The Faculty of Data Science is committed to driving innovation in educational models to adapt to the evolving academic and industry demands. The introduction of these new programs will not only strengthen the faculty's important position in the field of data science but also provide students with broader academic horizons and richer career development paths.

In addition, the faculty has actively promoted the signing of joint cultivation cooperation agreements between the university and multiple domestic universities in mainland China. It has launched joint cultivation programs for doctoral and master's students with Shenzhen Technology University, and has established joint doctoral cultivation programs with Shenzhen University of Technology, Shenzhen Technology University, Yunnan University, Qingdao University of Science and Technology, Qilu University of Technology, Hangzhou Dianzi University, Guangdong University of Technology, the Yangtze River Delta Research Institute of Zhejiang, and Zhejiang Provincial People's Hospital, among other institutions, to jointly cultivate students in fields such as data science, computer science, and AI in healthcare. Among these, the cumulative number of jointly cultivated graduate students has reached 46, including 15 doctoral students jointly recruited with Shenzhen University of Technology, 9 doctoral students jointly recruited with Shenzhen Technology University, 1 doctoral student jointly recruited with Yunnan University, 1 doctoral student jointly recruited with Qingdao University of Science and Technology, 10 doctoral students jointly recruited with Qilu University of Technology, 1 doctoral student jointly recruited with Hangzhou Dianzi University, 1 doctoral student jointly recruited with Guangdong University of Technology, 2 doctoral students jointly recruited with the Yangtze River Delta Research Institute of Zhejiang, and 6 doctoral students jointly recruited with Zhejiang Provincial People's Hospital.

Student internship and exchange

To further promote international academic exchange and cooperation, enhance students' global perspective and cross-cultural communication skills, the college has established a student exchange program with the Griffith University School of Computing in Australia, receiving strong support from the Australian government. This initiative provides a valuable platform for learning and exchange for students in the field of data science from both institutions. This year marks the second cohort of exchange students, with eight students arriving for a three-month study and exchange program.

Besides, faculty has actively expanded its industry-academia-research collaboration network by signing cooperation agreements with numerous well-known enterprises and universities, committed to building high-quality internship, training, and exchange platforms for students, thereby effectively enhancing their practical abilities and professional competence. These collaborations not only broaden students' learning environments but also promote deep integration between academia and industry, opening broader career development paths for students. Through these cooperation frameworks, students can participate in enterprise internship programs, accumulate hands-on experience, and expand their professional networks in relevant fields. The cooperating organizations listed in Table 5 span diverse industries and sectors, reflecting both the breadth of the faculty's disciplinary layout and its ongoing efforts in promoting the integration of industry and academia. These diverse collaboration opportunities allow students to select internship directions based on their personal interests and career plans, thereby gaining unique advantages in the job market and enhancing their competitiveness.

Table 5. Internship Units

Ref	Internship Unit	Location	Participation Category
1	Guangdong University of Technology	Guangzhou	Undergraduate & Postgraduate
2	Data tells stories Big data and AI intelligent applications	Henqin	Postgraduate
3	Orbit-Spatial-temporal Big Data and Artificial Intelligence Joint Laboratory	Henqin	Postgraduate
4	NetCraft Information Technology (Macau) Co., Ltd.	Macau	Undergraduate (Local student only)
5	Guangdong Provincial First Veterans Hospital	Guangzhou	Undergraduate & Postgraduate
6	BoardWare Intelligence Technology Co., Ltd. /Pengcheng Laboratory	Shenzhen	Master students
7	Zhuhai Yingying Technology Co., Ltd.	Zhuhai	Postgraduate
8	Baidu Online Network Technology (Beijing) Co., Ltd	Beijing	Undergraduate & Postgraduate
9	Aerospace Hi-Tech Holding Group Co., Ltd.	Mainland China	Postgraduate

10	CTM - Macau Telecom Company, Ltd	Macau	Undergraduate & Postgraduate (Local student only)
11	Shenzhen Institute of Advanced Technology Chinese Academy of Sciences	Shenzhen	Doctors
12	First Affiliated Hospital of Shandong First Medical University	Shandong	Postgraduate
13	Zhuhai Institute of Advanced Technology, Chinese Academy of Science	Zhuhai	Postgraduate

Student Activities and Awards

In 2025, students of the Faculty of Data Science actively participated in various activities and competitions, achieving outstanding results and demonstrating their talents and abilities. These activities not only enhanced students' practical skills but also strengthened their teamwork spirit and innovative thinking. The faculty regularly invites industry experts and academic leaders to deliver lectures, providing students with valuable learning opportunities, broadening their horizons, and promoting the diverse development of the discipline. Through these exchanges, students are able to gain insights into the latest industry trends while receiving advice and guidance on future career planning.

The student activities organized during this academic year are detailed in Table 6, which lists the time, location, and number of participating students for each activity. In addition, Table 7 showcases the competitions and awards obtained, further highlighting students' performance and the honors they earned in various competitions. These activities and competitions not only improved students' academic abilities but also laid a solid foundation for their career development, demonstrating the comprehensive approach of the Faculty of Data Science in education and practice.

Table 6. Student Activities

Event Name	Date	Number of participants	Participation Category
FDS Successfully Holds Free Health Check-Ups Event	2025/1/17	200	Teachers & students
Teaching Workshop organised by the Faculty of Data Science	2025/2/12	40	Teachers & students
Fang Class and Information Security Masters Forum	2025/4/11	60	Teachers & students
The Opening Ceremony and On-site Class of Fang Class Seminar Hall	2025/4/13	120	Teachers & students
2025 Undergraduate Graduation Project and Internship Briefing Session	2025/5/8	120	Teachers & students

CityU hosts achievement exhibition to showcase innovations in smart tech education	2025/6/4	50	Teachers & students
CityU hosted the KSEM International Conference.	2025/8/5	100	Teachers & students
Orientation Series Activities for the 2025/2026 Academic Year	25/8/2025-29/8/2025	300	Teachers & students
"Data Circulation Security and Transactions" Conference	30/8/2025-1/9/2025	100	Teachers & students
"2025 Cross-Border Data Security Forum (Seminar)"	2025/10/8	200	Teachers & students
Huawei ICT Competition 2025-2026 Macau Station City University of Macau Roadshow	2025/10/16	100	Teachers & students
Welcome Meeting for International Exchange Students from Griffith University, Australia	2025/11/4	12	Teachers & students
Orientation on the Dual Bachelor's Degree Program with Deakin University, Australia	2025/11/21	80	Teachers & students

Table 7. Student achievements and awards

Competition Name	**Awards**	**Award Winners**	**Instructor**	**Date**
“The CP Cup” 15th National College Student Market Research and Analysis Competition National Finals	First Prize	Li Dongxiao, Xie Yizhe, Zhang Xinyue, Wang Zijun, Chen Xi	Jing Fengshi、Liu Wenjian	2025/5/24-25
“The CP Cup” 15th National College Student Market Research and Analysis Competition National Finals	Second Prize	Tian Xingyuan, Chen Ruinan, Lin Zitong, Tang Ruopu	Jing Fengshi	2025/5/24-25
The 15th National College Student E-Commerce “Innovation, Creativity and Entrepreneurship” Challenge – City University of Macau Faculty-Level Competition	Faculty-Level First Prize, Best Innovation Award, Best Creativity Award, Best Entrepreneurship Award	Liu Junhao, Lin Fazong, Chen Yichuan, Fang Yuxin, Zhou Junye	Cui Sanshuai、Lin Baiyu、Peng Dongsheng (Industry Mentor)	2025/4/10
The 15th MathorCup Mathematical Application	Regional Third Prize	Jiang Siyu, Yang Zhe, Song Shanquan	Cui Sanshuai	2025/4/22

Challenge 2025 – South China Regional Competition				
"Youth Innovation Beijing" 2025 "Challenge Cup" Capital College Student Extracurricular Academic Science and Technology Works Competition – "Youth Gathering AI" Artificial Intelligence+ Special Competition	First Prize	Cheng Yuxuan	Cui Sanshuai	2025/6/9
2025 Guangdong Province Postgraduate Forum – Cyberspace Security Postgraduate Forum	Second Prize	Wang Linlin	Zhu Tianqing	2025/7/8
2025 Guangdong Province Postgraduate Forum – Cyberspace Security Postgraduate Forum	Second Prize	Qin Laiqiao	Zhu Tianqing	2025/7/8
The 14th National Marine Vehicle Design and Production Competition (South China Regional Competition)	First Prize Third Prize	Yuan Ziang, Shi Zihan	Duan Junwei	2025/7/12-13
The 14th National Marine Vehicle Design and Production Competition (South China Regional Competition)	Third Prize	Li Jiaxi, Pei Haolin, Guo Yifan, Zheng Wenjun	Duan Junwei	2025/7/12-13
The 14th National Marine Vehicle Design and Production Competition National Finals	Second Prize	Yuan Ziang, Shi Zihan	Duan Junwei	2025/8/9-10
The 14th National Marine Vehicle Design and Production Competition National Finals	Second Prize	Li Jiaxi, Pei Haolin, Guo Yifan, Zheng Wenjun	Duan Junwei	2025/8/9-10
Guangdong-Hong Kong-Macao Greater Bay Area IT Application System Development Competition (Macau Division)	Merit Award	Tian Xingyuan, Li Dongxiao, Lü Weiyi, Li Baixi	Liu Wenjian、Jing Fengshi	2025/9/20

Guangdong-Hong Kong-Macao Greater Bay Area IT Application System Development Competition (Macau Division)	Finalist Award	Ma Yuxuan, Li Jihao, Ou Junhong, Li Bowen	Liu Wenjian、Jing Fengshi	2025/9/20
The 10th Guangdong-Hong Kong-Macao Greater Bay Area IT Application System Development Competition Finals	Grand Prize	Tian Xingyuan, Li Dongxiao, Lü Weiyi, Li Baixi	Liu Wenjian、Jing Fengshi	2025/11/22
"Huawei Cup" 22nd China Postgraduate Mathematical Contest in Modeling	Second Prize	Du Yaoqiang, Chen Yuli, Huang Zhenxing	Zhang Qi、Zhu Tianqing	2025/09/21-2025/09/25
"Huawei Cup" 22nd China Postgraduate Mathematical Contest in Modeling	Third Prize	Zhang Xuanke, Zhu Ziyang, Jin Jiamin	Zhang Qi、Liu Wenjian	2025/09/21-2025/09/25
"Challenge Cup" National College Student Extracurricular Academic Science and Technology Works Competition	Third Prize	Ma Jiayu, Dong Ruijing, Sun Yifan, Liao Mengyao, Shi Ziyuan, Li Yanan, Chen Yanxi, Zheng Junyu, Tang Jingyao, Wu Chenfei	Zhang Qi	2025/6/9-10
Huawei ICT Competition 2025-2026 · Macau Station	Advanced to the Finals	Qiu Haojia, Gong Shunkai, Guan Kaiqing, Luo Junyi, Li Maoqi, Zhang Yongle, Feng Yunzhu, Zhang Xinlei, Chen Jiajia, Zhang Lanwei, Gu Yiwen	Cui Sanshuai	2025/11-12/8
Huawei ICT Competition 2025-2026 · Macau Station	Advanced to the Finals	Wang Jiaheng, Cao Peng, Zhang Xingrui, Du Yaoqiang, Zhang	Cui Sanshuai	2025/11-12/8

		Kaitong, Wang Yang, Cui Xiangyu		
2025 Higher Education Press Cup National College Student Mathematical Contest in Modeling	First Prize	Qian Yipeng, Li Yanan, Li Yibo	Zhang Lefeng	2025-09.04-2025.09.07
Huawei ICT Competition 2025-2026 · Macau Station	Advanced to the Finals	Gong Shunkai, Luo Junyi, Li Maoqi	Li Xingfeng	2025/11-12/8
The 4th Nanhang (Nanjing University of Aeronautics and Astronautics) Innovation Challenge 2025 – “AI + Aviation” Creative Track	Second Prize	Huang Chongming, Li Zhou Yicheng, Ma Qun, He Qianying, Liu Wei, Ma Jiayu, Dong Ruijing	Cui Sanshuai、Zhang Qi、Guo Lei (Industry Mentor)	2025/10/31
The 6th Jiangmen City “Happy Employment in Wuyi” Entrepreneurship and Innovation Competition	Team Group Excellence Award and Prize Money	Cheng Yuxuan, Li Xuheng, Chen Jiajie	Cui Sanshuai	2025/11/30
IWACIII 2025 AI Challenge Finals	Second Prize	Jiang Siyu	Cui Sanshuai	2025/11/2
NewStar CTF 2025 × Spring-Autumn Cup	Second Prize	Jiang Siyu	Cui Sanshuai	2025/9/22-10-25
China International College Students’ Innovation Competition (2025) Finals	Gold Award	Chen Ruinan, Li Dongxiao, et al.	Liu Wenjian、Zhu Tianqing、Jing Fengshi、and 6 off-campus advising teachers	2025/10

Alumni

<u>Bachelor of Science in Intelligent Technology and Services</u>

Since the establishment of the Bachelor of Science in Intelligent Technology and Services has been committed to cultivating high-quality interdisciplinary talents for the digital economy development in the Greater Bay Area. Since 2023, the program has successfully produced three cohorts totaling 250 graduates, forming a stable system for delivering teaching outcomes. In the 2024/2025 academic year, the faculty conducted a follow-up survey of graduating students through an online questionnaire. A total of 148 questionnaires were distributed, covering all graduating students, and 129 valid responses were collected by the deadline of July 24, 2025, achieving a response rate of 87.2% with strong data representativeness. The survey covered modules including academic experience, employment destinations, and further study situations.

I. Overview of Graduates' Basic Situation

1.1 Demographic Characteristics

- Gender: Male graduates account for 85.1%, and female graduates for 14.9%, reflecting the common gender distribution characteristics in the STEM field.
- Place of Origin: Students from mainland China constitute the overwhelming majority (92.5%), with local students from Macau accounting for 6.8%, and students from Hong Kong, China, and other countries and regions only 0.7%.

1.2 Graduation Rate Remains Stable, Demonstrating Resilience in Teaching Quality

In the 2024/2025 academic year, the student enrollment for this program expanded from 60 in the previous academic year to 148 (an increase of approximately 247%), while the graduation rate remained at a high level of 94.3%, essentially on par with the previous year's 95%. These data indicate effective allocation of teaching resources: despite the substantial increase in student numbers, the faculty has ensured that teaching quality is not affected by scale expansion through measures such as hiring additional full-time teaching staff.

II. Analysis of Professional Satisfaction and Professional Identity

2.1 Graduates' Overall Satisfaction with the Program is Relatively High, Showing a Significant Positive Skewed Distribution

The data show that 91% of respondents selected a score of 4 or above (with 62% giving 5 points and 29% giving 4 points), indicating that most graduates hold a positive evaluation of the program. The average score reached 4.5 (out of 5), further confirming the high level of satisfaction. The distribution exhibits a significant positive skew: scores of 5 account for over 60%, while low scores (1-3 points) total only 9%, with extremely low proportions for 1 point (2%) and 2 points (1%), reflecting a weak concentration of negative evaluations.

2.2 Confidence in Professional Development

The data reveal that 72% of graduates (optimistic 49% + very optimistic 23%) hold a positive attitude toward the prospects of the Intelligent Technology and Services program, indicating that the program's training direction is fundamentally aligned with industry needs and that students recognize its development potential. The 16% who selected "no opinion" may lack understanding of industry dynamics, necessitating strengthened career planning guidance; the 12% who feel confused reflect doubts among some students regarding employment directions or skill matching.

III. In-Depth Analysis of Graduate Destinations

3.1 Further Studies (66.67%, 86 students)

The following characteristics are observed:

- Admission Competitiveness: 76% of graduates received 1-3 conditional offers, while 24% of outstanding students received more than 3 conditional offers.
- Concentration in Discipline Selection: The overwhelming majority (87%) of graduates chose majors related to computer science, such as data science, artificial intelligence, and information technology, which are highly aligned with the program's curriculum. In contrast, only 4% chose tourism services (hospitality management) and 9% chose other majors (such as business).
- Internationalization Performance: Among the 40 students admitted to QS Top 100 universities, 83% chose to pursue advanced studies in cutting-edge directions such as artificial intelligence and data science, demonstrating the effectiveness of the program's international benchmarking.

Table 8. Summary of Graduates' Further Studies

QS Ranking	Institution	Number of Students
9	Imperial College London	4
11	ETH Zurich	1
12	University of Hong Kong	1
20	New York University	7
25	Monash University	4
31	King's College London	4
32	The University of Western Australia	2
34	University of Southampton	1
36	University of Glasgow	2
38	University of Leeds	1
42	Durham University	3
51	The University of New South Wales	4
54	The University of Hong Kong	2

65	University of Warwick	1
86	University of Bristol	1
92	University of Exeter	1
94	Duke University	1
211 Engineering	Xi'an University of Electronic Science and Technology	1

Typical Cases:

- Student Luo Zeyu was admitted to the direct PhD program in Electrical and Computer Engineering at Auburn University in the United States. During his studies, he published two SCI/EI-level papers as the second author.
- Student Pang Sen was admitted to the master's program in Applied Data Science at the University of Southern California in the United States. During his studies, he published one SCI(E) journal paper as the first author.
- Four students—Shi Xueru, Huang Zanlin, Liu Qimiao, and Qi Jinyu—were admitted to University College London in the United Kingdom (QS World University Ranking 9th). Student Xu Huiwen was admitted to the University of Hong Kong (ranking 11th). Student Zhang Yanze was admitted to Nanyang Technological University in Singapore (ranking 12th). Seven students—Wang Tongyu, Gao Zheng, Zhang Wuji, Cheng Xindong, Huang Zegui, Chen Wenjian, and Lu Jun—were admitted to the University of New South Wales in Australia (ranking 20th).

3.2 Employment (15.5%, 20 students)

Among the graduates who chose employment, 11 students (55%) have already secured jobs, while 9 graduates (45%) are currently unemployed (having been job searching for 1-3 months). One local student from Macau remained in their original employment unit, and another local student from Macau received a job offer from a Macau gaming and entertainment company prior to graduation. Four mainland students secured positions at Tencent Holdings Limited, Ping An Bank Zhuhai Branch, (HKC) Huike Co., Ltd., and Beijing Zhongxingcai Guanghua Accounting Firm, respectively.

From the perspective of geographical distribution, the employment locations of the 11 employed graduates exhibit distinct regional clustering characteristics. The Guangdong-Hong Kong-Macao Greater Bay Area has emerged as the primary employment destination, absorbing 8 graduates and accounting for 72.7% of the total employed. Specifically, Shenzhen, as a center for technological innovation, attracted 5 graduates; one graduate joined Ping An Bank in Zhuhai; and two graduates successfully secured employment locally in Macau. In addition, cities active in technological innovation, such as Beijing, Hangzhou, and Chongqing, each absorbed one graduate.

Table 9. Employers of Employed Graduates

Employer	Number of Graduates
Macau Zhuxin Library	1
SJM Holdings Limited	1
Zhongxingcai Guanghua Certified Public Accountants LLP	1
Shenzhen Kaitao E-Commerce Co., Ltd.	1
Chongqing Central State-Owned Enterprises	1
Ping An Bank Co., Ltd. [Zhuhai]	1
Hangcha Group Co., Ltd. [Hangzhou]	1
Shennan Circuits Co., Ltd.[Shenzhen]	1
Tencent Holdings Limited [Shenzhen]	1
Shenzhen Sowosi Intelligent Manufacturing Co., Ltd.	1
HKC Corporation Limited [Shenzhen]	1

3.3 Business Start-up (0.78%, 1 student)

In the 2024/2025 academic year, among the graduates of the Bachelor of Science in Intelligent Technology and Services, student Su Jingye chose to start his own business, becoming the only entrepreneurial representative in this cohort. Based on his personal career aspirations, the student launched a self-media business in Foshan City, Guangdong Province, demonstrating innovative spirit and pioneering ability.

3.4 Undecided (17.05%, 22 students)

Six students chose to take a gap year before deciding on their personal direction, two students are awaiting spring enrollment for postgraduate programs, six students opted to further study English or prepare for civil service examinations, and eight students have not yet determined their direction due to the lack of suitable job positions or opportunities for further studies.

The achievements of the graduates in the 2024/2025 academic year highlight the effectiveness of the program's interdisciplinary training model of "Intelligent Technology + Service Management," providing interdisciplinary talent support for Macau and the Greater Bay Area.

Master of Data Science Program

Since the establishment of the Master of Data Science program in 2018, a total of 261 graduates have successfully completed their studies at the university, cultivating a new generation of interdisciplinary high-level talents in data analysis and processing for the nation, equipped with solid theoretical foundations and outstanding innovative capabilities. In terms of demographic characteristics, the gender structure shows that male graduates account for 72% and female graduates for 28%, reflecting the common gender distribution characteristics in the STEM field. The distribution of student origins indicates that students from mainland China constitute the overwhelming majority (99%), with local students from Macau accounting for 1%.

In the 2024/2025 academic year, the student enrollment for this program expanded from 72 in the previous academic year to 80 (an increase of approximately 11%), while the graduation rate remained at a high level of 96%, compared to the relatively high 91% in the previous academic year. These data indicate effective allocation of teaching resources: despite the increase in student numbers, the faculty has ensured that teaching quality is not affected by scale expansion through measures such as hiring additional full-time teaching staff.

Master of Computer Science Program

Since the establishment of the Master of Computer Science in 2023, a total of 34 graduates has successfully completed their studies at the university, cultivating innovative talents in computer science-related fields for the nation. In terms of demographic characteristics, the gender structure shows that male graduates account for 68% and female graduates for 32%, reflecting the common gender distribution characteristics in the STEM field. The distribution of student origins indicates that students from mainland China constitute the overwhelming majority (97%), with local students from Macau accounting for 3%.
In the 2024/2025 academic year, the faculty conducted a follow-up survey of graduating students through an online questionnaire. A total of 114 questionnaires were distributed, covering all graduating students, and 114 valid responses were collected by the deadline of November 28, 2025, achieving a response rate of 100% with strong data representativeness. The survey covered modules including perspectives on future prospects, employment destinations, salary levels, and further study situations.

I. Professional Satisfaction and Perspectives on Future Prospects

The data indicates that in terms of satisfaction, 93% of respondents selected a score of 4 or above (with 72% giving 5 points and 21% giving 4 points), showing that most graduates hold a positive evaluation of the program. The average score reached 4.65 (out of 5), further confirming the high level of satisfaction. Regarding perspectives on future prospects, 86% of graduates (optimistic 50% + very optimistic 36%) hold a positive attitude toward the program's prospects, indicating that the program's training direction is fundamentally aligned with industry needs and that students recognize its development potential. The 9% who selected "no opinion" may lack understanding of industry dynamics, necessitating strengthened career planning guidance; the 5% who feel confused or disheartened reflect doubts among some students regarding employment directions or skill matching, primarily concentrated in the unemployed group.

II. Employment Status Analysis

Currently, approximately 45% of graduates are employed, about 35% are unemployed, around 15% are pursuing further studies, and about 5% are engaged in entrepreneurship. The job roles of employed graduates are mostly in positions related to data science, network engineering, software development, and education, with a minority engaged in non-information science industries or cross-disciplinary work. Employment locations are primarily concentrated in Guangdong Province (Shenzhen, Guangzhou, Zhuhai, Jiangmen, etc.), followed by developed regions such as Beijing, Shanghai, Jiangsu, and Zhejiang, with a small number working in Macau or Hong Kong.

III. Salary Situation

According to statistics, the monthly salary distribution (in Macanese Pataca) of employed graduates from the faculty is as follows: approximately 15% earn ≤5,000, 25% earn 5,001–10,000, 30% earn 10,001–15,000, 20% earn 15,001–20,000, and 10% earn above 20,000. Overall, graduates' salary levels are closely associated with their work location and industry, with those employed in the Greater Bay Area and first-tier cities generally receiving higher remuneration.

IV. Intention and Direction for Further Studies

The data show that 19% of graduates chose to pursue further studies, with their primary motivations being to enhance personal capabilities (approximately 50%), followed by future development and job market competitiveness (approximately 30%), and academic research or personal interest (approximately 20%). The preferred regions for further studies are mainly institutions in Hong Kong, Macau, and Taiwan (such as City University of Macau and Macau University of Science and Technology), with some choosing mainland universities (such as Sun Yat-sen University and Jiangnan University). In terms of majors, most select fields related to their original program (data science, computer science, communication engineering, etc.).

V. Business Start-up

The data indicate that only 2% of graduates chose to start their only business, with fields mostly related to data science and information technology. Company scales are primarily micro or small, and motivations are largely driven by personal interest and capability alignment.

Doctor of Data Science Program

Since the establishment of the Doctor of Data Science in 2018, a total of 57 graduates has successfully completed their studies at the university, cultivating a new generation of interdisciplinary high-level talents in data analysis and processing for the nation, equipped with solid theoretical foundations and outstanding innovative capabilities. In terms of demographic characteristics, the gender structure shows that male graduates account for 84% and female graduates for 16%, reflecting the common gender distribution characteristics in the STEM field. The distribution of student origins indicates that students from mainland China constitute the overwhelming majority (88%), with local students from Macau accounting for 9% and students from other regions 3%.

In the 2024/2025 academic year, the faculty conducted a follow-up survey of graduating students through an online questionnaire. A total of 7 questionnaires were distributed, covering all graduating students, and 7 valid responses were collected by the deadline of July 21, 2025, achieving a response rate of 100%. The survey covered modules including perspectives on future prospects, employment destinations, salary levels, and further study situations.

I. Employment Satisfaction and Future Prospects

The data show that regarding professional satisfaction, satisfaction scores (1–5 points) are generally high: 4 points (2 students) and 5 points (5 students), reflecting a high level of recognition among graduates for the program's training. In terms of perspectives on future prospects, 85.7% (6 students) are optimistic or relatively optimistic, 14.3% (1 student) have no opinion, and there are no pessimistic sentiments, indicating overall strong confidence.

II. Employment Status Analysis

Currently, approximately 71.4% (5 students) are employed, and about 28.6% (2 students) are engaged in entrepreneurship. All employed graduates are working in roles related to data science, software development, computer science, or data education, demonstrating a high alignment between the employment of doctoral graduates from this program and their field of study.

III. Business Start-up

The data show that entrepreneurship accounts for a certain proportion, approximately 28.6% (2 students), both driven by personal capabilities and interests, and involving businesses related to data science and software development. This reflects that some graduates possess innovative awareness and a willingness to take risks.

IV. Salary

According to statistics, the monthly salaries (in Macanese Pataca) of employed graduates from the faculty are concentrated in the range of MOP 10,001–15,000. One graduate engaged in data science in Zhuhai earns more than MOP 20,000 per month, reflecting differences in salaries across regions and industries.

Research and Innovation

Overview of research areas and key points

In 2025, the Faculty of Data Science achieved a significant leap forward in the fields of research and innovation. The faculty published multiple academic papers in top-tier journals and international conferences in areas such as cybersecurity, artificial intelligence, and bioinformatics, demonstrating fruitful research outcomes. In addition, the faculty has continued to dedicate itself to advancing the frontiers of data science, actively leading numerous pioneering research projects, with a total funding amount reaching approximately MOP 23,494,938.00 (for details, please refer to Table 10). The number of approved projects in recent years has continued to grow, increasing from 3 in 2022 to a substantial rise to 31 in 2025, reflecting a marked enhancement in the faculty's research capacity and competitiveness. The faculty's research and innovation efforts in the 2025 academic year were outstanding: not only securing substantial funding and publishing high-level papers but also establishing solid collaborative relationships with renowned academic institutions. With the sustained commitment and enthusiasm of its members toward data science, the faculty is poised to make continuous breakthroughs in this field over the coming years, creating even greater contributions.

Table 10. Summary of Approved Research Projects from 2022 to 2025

Year	Number of Approved Research Projects	Total Funding Amount for Approved Projects (approx. MOP)
2022	3	$2,327,000.00
2023	5	$1,482,800.00
2024	4	$4,617,580.00
2025	31	$23,494,938.00

Approved Projects

In the 2025 academic year, the faculty successfully secured approximately MOP 23,403,908 in research funding (for details, please refer to Table 11). The research areas cover cybersecurity, medical data analysis, collaborative platforms, and artificial intelligence, among others. These projects will support faculty members in contributing to the development of Macau and the Greater Bay Area. In addition, since 2024, City University of Macau has become one of only two private higher education institutions in the Hong Kong and Macau regions to serve as a relying unit for the National Natural Science Foundation of China.

Table 11. Research projects funded in the 2025 academic year

Funding Unit	Project Title	Principal Investigator	Currency	Grant Amount
Macao Foundation	"人才引進計劃"下外地學生留澳發展策略研究	Hoi Io Kong	MOP	180,000.00
National Natural Science Foundation of China (NSFC)	面向大模型的無參化可認證機器遺忘與隱私平衡研究	Zhang Lefeng	RMB	300,000.00
National Natural Science Foundation of China (NSFC)	面對複雜開放交互環境中 AI 圖像合成的防禦技術研究	Liu chi	RMB	300,000.00
National Natural Science Foundation of China (NSFC)	聯邦學習場景下差分隱私噪聲分佈優化技術研究	Cai Jianping	RMB	300,000.00
University of Macau	基於二維晶體異質結的納米流控器件研制	Ge Dongjiao	MOP	300,000.00
Science and Technology Development Fund of Macau	倫理框架下的大模型安全研究	Zhou Wanlei	MOP	2,100,000.00
Inspur Cloud Information Technology Co., Ltd.	Web 流量威脅檢測規則生成技術研究	Zhang Lefeng	RMB	816,000.00
Escola Fukien de Macau	基於人工智能技術的教育數字化系統	Weng Tak Kuok	MOP	742,000.00
Science and Technology Development Fund (FDCT)	面向智慧康養的嵌入式視頻數據隱私處理與監測研究	Weng Tak Kuok	MOP	847,200.00
Science and Technology Development Fund (FDCT)	澳門中小學手衛生智能監測系統研發與應用效果評價	Jing Fengshi	MOP	860,000.00
Science and Technology Development Fund (FDCT)	智能化暗網威脅全景感知與動態預警系統	Zhu tianqing	MOP	1,481,900.00
Science and Technology Development Fund (FDCT)	面向澳門中小學體育數字化升級的無線 MEMS 傳感單元動作捕系統	Jing Fengshi	MOP	300,000.00
Science and Technology Development Fund (FDCT)	數值模式超分辨率研究	Hoi Io Kong	MOP	390,500.00
Science and Technology Development Fund (FDCT)	魯棒位姿估計快速算法研究	Liu Yinlong	MOP	391,000.00
Science and Technology Development Fund (FDCT)	面向澳門互聯網平台的冷啟推薦模型及關鍵技術研究	Chen Hao	MOP	425,000.00

Science and Technology Development Fund (FDCT)	龍門式光伏清潔機器人自主作業基礎理論及關鍵技術研究	Duan Junwei	MOP	863,400.00
Macau Xiaocheng Digital Technology Co., Ltd.	共建「醫療人工智能產學研聯合實驗室」	Gu Jia	MOP	100,000.00
Shenzhen Juwan Spatio-Temporal Big Data Technology Research Institute	聯合建設"人工智能和大數據聯合實驗室"	Liu Wenjiang	RMB	600,000.00
Tertiary Education Fund	2025/2026 學年高等院校年度資助計劃--澳門高等院校教研人員專業發展資助(第一期)	Zhang Qi	MOP	3,958.46
Science and Technology Development Fund (FDCT)	面向大灣區康養數據的安全協同計算關鍵技術研究	Ying Zuobin	MOP	1,216,400.00
Science and Technology Development Fund (FDCT)	面向服務機器人的具身多模態大模型關鍵技術研究	Sun Xin	MOP	1,291,560.00
Science and Technology Development Fund (FDCT)	基於大模型的惡意流量監測規則自動生成技術研究	Zhu tianqing	MOP	1,532,000.00
Science and Technology Development Fund (FDCT)	基於異構區塊鏈間數據交換技術	Ying Zuobin	MOP	2,334,800.00
Science and Technology Development Fund (FDCT)	面向跨域任務的無人機協同機動控制	Yu Wei	MOP	373,000.00
Science and Technology Development Fund (FDCT)	面向大模型的可調節機器遺忘策略研究	Zhang Lefeng	MOP	266,000.00
Science and Technology Development Fund (FDCT)	基於空天遙感的城市智能感知關鍵技術研究	Sun Xin	MOP	3,311,200.00
Science and Technology Development Fund (FDCT)	數據跨境場景下深度學習模型的對抗攻擊防禦方法研究	Sun Hui	MOP	334,000.00
Science and Technology Development Fund (FDCT)	面向高精度低能耗的類腦脈衝神經網絡訓練與轉換研究	Wu Xiaofeng	MOP	375,000.00
Science and Technology Development Fund (FDCT)	基於多模態基礎大模型的"篩-診-預"一體化眼健康管理關鍵技術研究	Liu chi	MOP	370,250.00
Science and Technology Development Fund (FDCT)	面向對抗環境的 AI 模型版權判定方法研究	Zhou Shuai	MOP	374,500.00

Open Topic Fund of the National Center for Research on Earthquake Engineering	基於條件約束自回歸擴散的振動台實驗視頻生成模型研究	Sun Hui	RMB	80,000.00

Publishing

Table 12. Summary of publication status

	Q1	Q2-Q4	EI	Monograph	CSSCI Core Journals	General Journals	ESCI	SCI Indexed	Total
2022	41	21	14	1	1	-	2	62	80
2023	52	12	19	5	-	2	1	64	91
2024	130	34	85	1	6	6	6	164	268
2025	167	40	137	1	2	2	4	207	353

In the 2025 academic year, the faculty published a total of 353 papers, among which 207 were indexed by SCI, with 167 included in JCR Q1 journals. The faculty also published well-known international journals such as *IEEE Transactions on Information Forensics and Security* (cybersecurity topics), *IEEE Transactions on Computers* (data engineering topics), and *ACM Computing Surveys* (computer science review topics). In addition, faculty members of the college authored and presented papers at top conferences recommended by the China Computer Federation, including those in artificial intelligence categories such as ICML, IJCAI, AAAI, and NeurIPS, as well as conferences in the security category such as USENIX.

Key publications and their impact

In the current year, the Faculty of Data Science has achieved fruitful research outcomes spanning multiple fields including artificial intelligence, information security, and data science. In the field of artificial intelligence, we have explored the issue of machine unlearning in federated learning to protect data privacy and optimize model performance. In information security, we have introduced the problem of prompt-based attacks and their corresponding defenses. In data science, to address the supply–demand mismatch caused by the fluctuations in renewable energy output, we have proposed a renewable-following coordination and incentive method for electric vehicle aggregators. These accomplishments demonstrate the strength of the research of the faculty in data science and artificial intelligence, laying a solid scientific foundation for future technological advancement and practical applications.

- **Artificial Intelligence**

Liu, Chi, Jincheng Liu, Congcong Zhu, Minghao Wang, Sheng Shen, Jia Gu, Tianqing Zhu, and Wanlei Zhou. "Rethinking Bias in Generative Data Augmentation for Medical AI: a Frequency Recalibration Method." The Fortieth AAAI Conference on Artificial Intelligence (AAAI-26), Singapore, 2026.

This research investigates the potential bias issues in generative data augmentation for medical image processing, demonstrating that the spectral distribution bias of synthetic images is one of the key factors leading to the instability of dataset augmentation. Additionally, it proposes a plug-and-play and highly compatible spectral recalibration post-processing method, which effectively enhances the stability and performance of GDA in downstream tasks.

Wei Wan, Yuxuan Ning, Zhicong Huang, Cheng Hong, Shengshan Hu,Ziqi Zhou, Yechao Zhang, Tianqing Zhu, Wanlei Zhou, Leo Yu Zhang. MARS: A Malignity-Aware Backdoor Defense in Federated Learning. In: 39th Neural Information Processing Systems (NeurIPS), San Diego, USA, Dec 2-7, 2025.

This study addresses the increasingly severe backdoor threats in federated learning, systematically revealing that the fundamental cause of existing defense failures lies in their excessive reliance on empirical statistical metrics that are weakly correlated with attack intent. Considering this, the paper proposes a maliciousness-aware defense method, which achieves precise identification of malicious clients by characterizing backdoor energy at the neuron level and constructing concentrated backdoor energy representations.

- **Information Security**

Dayong Ye, Tianqing Zhu, Feng He, Bo Liu, Minhui Xue, and Wanlei Zhou. Cross-Modal Prompt Inversion: Unifying Threats to Text and Image Generative AI Models. In Proceedings of the 34th USENIX Security Symposium (USENIX Security '25), pages 2303–2322, Seattle, WA, USA, August 13-15, 2025.

This paper proposes a cross-modal prompt inversion attack method capable of reconstructing the original prompts solely based on the outputs of a generative model. The approach is applicable to both text generation and image generation models and holds the potential for extension to the video generation modality. It highlights the potential risks of prompt leakage in terms of privacy protection and intellectual property, providing a systematic analytical framework and empirical evidence for research on the security of cross-modal generative models.

Lefeng Zhang, Tianqing Zhu, Ping Xiong and Wanlei Zhou, "Trojan Attack on Machine Unlearning: Security Risk of the Right to be Forgotten," in IEEE Transactions on Dependable and Secure Computing, vol. 22, no. 5, pp. 5480-5493, 2025.

This paper highlights potential security risks arising from the current situation where "the right to be forgotten" is legally protected and users' machine unlearning requests are bound to be executed. Specifically, it points out that attackers could exploit forgotten data during the training process to conceal the impact of malicious data and then remove the covering data through machine unlearning after model training is completed, ultimately achieving the goal of model poisoning. The article analyzes the feasibility of such attacks under certain conditions and proposes relevant defense strategies.

- **Data Science**

Chen, Huiqiang, Tianqing Zhu, Xin Yu, and Wanlei Zhou. "Zero-shot machine unlearning with proxy adversarial data generation." In Proceedings of the Thirty-Fourth International Joint Conference on Artificial Intelligence, pp. 339-347. 2025.

This paper proposes a machine unlearning method aimed at removing the influence of specific samples from a model. However, in zero-shot scenarios where only the data to be forgotten is available, how to avoid over-forgetting remains an open problem. This work addresses this by generating adversarial samples to approximate the remaining data, estimating a specific subspace, and performing unlearning within its orthogonal complement, effectively mitigating performance degradation. Additionally, it introduces function-based pseudo-label optimization, enabling the model to achieve improved performance after unlearning. Theoretical analysis and extensive benchmark experiments validate the effectiveness and significant advantages of the proposed method.

Lai Shuying, Dong Zhao Yang, Yang Hongming, Tao Yuechuan, Yip Christine, Qiu Jing, & Zhao Junhua," Renewable Energy Following Strategy via Quantified Aggregated Heterogeneous Electric Vehicle Flexibility," IEEE Transactions on Smart Grid，vol. 16, no. 5, pp.3873 - 3886, 2025.

This paper addresses the supply-demand mismatch caused by fluctuations in renewable energy output by proposing a renewable-following coordination and incentive method for electric vehicle aggregators. The approach employs a two-layer optimization framework to characterize the interaction between "aggregator pricing and aggregated dispatch" and "user participation and charging/parking responses driven by utility," enabling scalable solutions. It demonstrates advantages in mitigating simultaneous peak loads and improving grid operational metrics.

Joint Laboratory Construction Status

Table 13. Summary of Joint Laboratory Construction status

Laboratory Name	Partner Companies	Establishment	Research Areas
Blockchain Digital Security Joint Laboratory	Shenzhen Kangming Technology Service Co., Ltd.	2022	Blockchain Security
Spatio-Temporal Big Data and Artificial Intelligence Joint Laboratory	Zhuhai Orbita Aerospace Science & Technology Co., Ltd.	2022	Artificial Intelligence
Local Root and Blockchain Laboratory	Pengcheng Laboratory, Shenzhen	2022	Cross-Border Data Governance; Research on Mainland-Macau Cross-Border Network DNS Domain Name Resolution Services
Industry and Intelligent Manufacturing Laboratory	Gree Electric Appliances	2022	Intelligent Manufacturing
Intelligent Healthcare Joint Laboratory	Shandong First Medical University	2022	Applications of Artificial Intelligence in Medical Scenarios
Business Intelligence Laboratory	DataStory	2022	Business Intelligence Analysis; Big Data Analysis
Cross-Domain Data and Intelligent Collaboration Laboratory	National Engineering Laboratory for Big Data Circulation and Transaction Technology	2022	Cross-Border Data Governance; Data Security
Data Security Intelligent Protection Joint Laboratory	Zhiwang Anyun (Wuhan) Information Technology Co., Ltd.	2022	Data Security; Privacy Protection Algorithm Research
Kangmingke Joint Laboratory	Shenzhen Kangmingke Technology Service Co., Ltd.	2022	Computer Applications; Blockchain Application Research
Pengcheng Bowei Macau Sub-Range - City University of Macau Cybersecurity Testing Base	Bowei Information System Co., Ltd.	2022	Cybersecurity; Cyber Attack and Defense Sandbox; Security Testing
Guangdong-Macau Medical Image Intelligent	Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences	2024	Artificial Intelligence

Computing and Analysis Joint Laboratory			
Green Trusted Intelligent Computing Joint Laboratory	Qinghai LanSuan Technology Co., Ltd.	2024	Artificial Intelligence and Trusted Computing
Medical Artificial Intelligence Industry-University-Research Joint Laboratory	Macau Xiaocheng Digital Technology Co., Ltd.	2024	Artificial Intelligence
City University of Macau - Yangtze Delta Region Research Institute of Tsinghua University Joint Laboratory	Yangtze Delta Region Research Institute of Tsinghua University, Zhejiang	2024	Artificial Intelligence Privacy and Security Algorithm Research
Veterans Hospital Digitalization Joint Laboratory	Guangdong Province No. 1 Glory Hospital	2024	Applications of Artificial Intelligence in Medical Scenarios; Smart Elderly Care and Rehabilitation
Trusted Storage and AI Joint Laboratory	Quantum Core Cloud Microelectronics Technology Co., Ltd.	2024	Data Security; Intelligent Storage
Cloud Campus Digital Education Joint Laboratory	AEMG Education Group	2024	Digital Education
Computational Imaging and Multimodal Intelligent Vision Joint Laboratory	Suzhou Yiji Intelligent Technology Co., Ltd.	2024	Artificial Intelligence
AI Internet of Things Joint Laboratory	Macau Digital Power Technology Co., Ltd.	2025	Artificial Intelligence
Artificial Intelligence and Big Data Joint Laboratory	Shenzhen Juwan Spatio-Temporal Big Data Technology Research Institute	2025	Artificial Intelligence
Data Circulation Security Compliance Governance Joint Laboratory	Macau Maiya Technology Co., Ltd.; Maibo Yuntong (Zhuhai Hengqin) Technology Co., Ltd.	2025	Data Security
Trusted Data Intelligence Joint Laboratory	Harbin Institute of Technology (Shenzhen)	2025	Data; Artificial Intelligence
Shandong Province Key Laboratory of Digital	The First Affiliated Hospital of Shandong First Medical University	2025	Artificial Intelligence Algorithms; Intelligent Healthcare

Diagnosis and Treatment for Thoracic Tumors			
City University of Macau - Zhejiang Sci-Tech University Frontier Interdisciplinary Research Center	Zhejiang Sci-Tech University	2025	Frontier Interdisciplinary Research
Intelligent Education Joint Laboratory	Beijing Jiwei Technology Co., Ltd.	2025	Intelligent Education

Invited speeches, keynote addresses and conference participation

In 2025, the faculty actively organized and encouraged its faculty and staff to participate in various academic activities, including serving as invited keynote speakers to discuss important topics such as emerging trends in artificial intelligence, prospects for data science security, cross-border data collaboration, and privacy protection. These activities not only facilitated in-depth exchanges with other institutions, accelerating the pace of collaboration, but also provided the faculty with a platform to showcase its latest research achievements and unique insights, offering in-depth analysis for the future development of data science.

Through this participation, faculty and staff were able to share professional knowledge, establish connections with peers, and further expand academic networks and collaboration opportunities. In addition, these activities effectively enhanced the faculty's visibility, attracting more partners and resources, thereby promoting improvements in academic research and educational quality. The faculty's efforts not only strengthened internal cohesion but also reinforced connections with the broader community, laying a solid foundation for future development.

1. **Participation in academic seminars**

Table 14. Participation in academic seminars

Ref	Conference/Event Name	Organizer	Date	Speakers
1	Cross-Strait Joint Seminar on Experimental and Theoretical Particle Physics	Institute of Theoretical Physics, Chinese Academy of Sciences	2025/04/27-2025/04/29	Huang Zhifeng
2	The 2nd CCF University Presidents Forum	China Computer Federation (CCF)	2025/5/5	Zhou Wanlei
3	The 10th National Conference on Intelligent Information Processing	Chinese Association for Artificial Intelligence (CAAI)	2025/5/16-18	Zhou Wanlei
4	"AI Empowering English Teaching and Learning" Training Course	Beijing Normal University-Hong Kong Baptist University United	2025/5/17	Zhu tianqing

		International College (UIC) and the International Foundation for English Language Education Research		
5	The 3rd Academic Conference on "Data Element Circulation and Security"	Editorial Department of Journal of Cyber Security and Information Security	2025/8/30-9/1	Zhou Wanlei、Zhu tianqing
6	2025 Huashan Young Scholars Forum	Xidian University	2025/09/26-30	Zhou Dawei
7	2025 High-End Control Taihu Forum	Technical Committee on Fault Diagnosis and Safety of Technical Processes, Chinese Association of Automation	2025/10/18-2025/10/20	Yu Wei
8	International Conference on Information Security and Cryptology	Xidian University and Chinese Academy of Sciences	2025/10/20	Zhou Wanlei
9	2025 Series Seminar on Joint Cultivation of Top Innovative Talents	Shenzhen 01 Academy and Nanjing University of Aeronautics and Astronautics	2025/10/31-11/02	Cai Jianping
10	The 3rd International Conference on Computers, Internet of Things and Smart Cities	Xi'an Jiaotong-Liverpool University (Faculty of Internet of Things)	2025/11/7-11/8	Cui Sanshuai
11	2025 Cloud-Edge Intelligence Collaborative Cross-Disciplinary Forum	Beijing Normal University Zhuhai Campus	2025/11/21-2025/11/23	Zuo Xuhan
12	Jiangsu-Hong Kong-Macao University Cooperation Alliance - 2025 Academic Forum of the Jiangsu-Hong Kong-Macao University Disaster Prevention and Emergency Management Professional Alliance	Jiangsu-Hong Kong-Macao University Cooperation Alliance, Nanjing University of Information Science and Technology, Hong Kong Baptist University, and University of Macau	2025/12/08-2025/12/10	Jing Fengshi

2. Host academic seminars

Table 15. Hosted academic seminars

Ref	Meeting Name	Organizer	Date	Participants
1	Fang Binxing Class and Information Security Masters Forum	City University of Macau	11/4/2025	Teachers & students
2	The 18th International Conference on Knowledge Science, Engineering and Management (KSEM 2025)	City University of Macau	2025/8/4-6	Teachers & students
3	2025 Cross-Border Data Security Forum (Seminar)	City University of Macau	2025/10/8	Teachers & students
4	Inauguration Ceremony of CCF Macau Member Activity Center and Special Committee Visit to Macau Activity	City University of Macau	2025/11/29	Teachers & students
5	AVS Standardization Meeting 2025	City University of Macau	2025/12/5-8	Teachers & students
6	Session on "Artificial Intelligence Models and Information Security" at the 2025 Cyberspace Security Academic Conference	City University of Macau	2025/12/5-7	Teachers & students

3. Invite experts to give lectures

Table 16. Expert Lectures

Ref	Category	Lecture topic	Date	Speaker
1	Academic Special Lecture	Testing Learning-Enabled Cyner-Physical Systems Current Approaches and Future Directions	2025/1/14	Assoc. Prof. Zheng Xi
2	Academic Special Lecture	Revealing Causal Information from Data	2025/1/17	Prof. Liu Tongliang
3	Academic Special Lecture	Research on multispectral panchromatic image fusion and algorithm lightweight deployment	2025/2/13	Assoc. Prof. Wang Peng

4	Academic Special Lecture	Deep Learning Based Biological Motifs Mining	2025/2/20	Prof. Huang Dengshuang
5	Academic Special Lecture	DeepSeek Uncovered: Technical Principles and Applications	2025/4/14	Prof. Li Zhoujun
6	Academic Special Lecture	Faculty of Data Science Academic Salon	2025/5/9	Prof. Zhu tianqing 、Asst. Prof. Weng Tak Kuok 、Asst. Prof. Qi Minfeng 、Asst. Prof.Zhu Hongguang
7	Academic Special Lecture	Provably Secre Searchable Symmetric Encrytions: Definition, Construction, Attacks and Defenses	2025/8/26	Prof. Ning Jianting
8	Academic Special Lecture	Multimodal Scene Understanding	2025/9/5	Prof. Han Jungong
9	Academic Special Lecture	Industrial Intelligent Optimization and Learning: What Have We Done?	2025/11/5	Prof. Gong Dunwei
10	Training Lecture	IEEE Database	2025/11/26	Ms. He Dandan
11	Academic Special Lecture	AI Coders Are among Us: Rethink Programming Language Design towards Efficient Code Generation	2025/12/4	Prof. Du Xiaoning

Teacher Development and Achievement

Academic recruitment and promotion

Table 17. Academic Staff Recruitment Plan

	Professor	Associate Professor	Assistant Professor	Lecturer
Academic Year25/26	0	3	13	0
Academic Year26/27	1	2	9	0
Sub-Total	1	5	22	0
Total number of new teaching staff	**28**			

In the past year, the faculty successfully recruited 17 new staff members, including 3 associate professors and 13 assistant professors. Their research areas cover AI, cybersecurity, data analytics, bioinformatics, and other fields. All full-time academic staff hold doctoral degrees and have overseas study experience. For the 2026 academic year, the faculty plans to recruit 12 full-time academic staff members, including 1 full professor, 2 associate professors, and 9 assistant professors.

Recruitment strategy and promotion

A. Overseas recruitment visits

Based on the successful visits to Australia, Singapore and other countries and regions last year, the Faculty of Data Science continues to introduce more potential talents into the faculty's recruitment system through face-to-face preliminary exchanges.

B. Through the recommendation of partner universities

The faculty actively establishes cooperative relations with well-known universities and research institutions at home and abroad, and expands talent recruitment channels through joint training, exchange visits and other forms to ensure that it can attract top academic talents in various fields.

C. Attract talents through project exchanges or academic conferences

i. The faculty actively participates in academic conferences and seminars at home and abroad, which enhances the international reputation and influence of the faculty, thereby attracting more outstanding academic talents.

ii. Encourage faculty and researchers to participate in various research projects and exchange activities, which not only improves research standards and results, but also brings more talent resources to the faculty.

D. Attract talents through the faculty's internal talent optimization system

i. The faculty provides systematic training and career development planning for teachers to help them continuously improve their professional ability and academic level.

ii. Establish an efficient team cooperation mechanism to improve the efficiency of cooperation and scientific research results among teachers.
iii. Provide a broad international platform and exchange opportunities, encourage faculty and researchers to participate in international academic cooperation, and enhance the academic vitality and global vision of the faculty.

Leadership roles and contributions in professional organizations

The Faculty of Data Science encourages its members to actively participate in various professional organizations and take on important positions. This initiative not only helps develop members' leadership abilities and enhance their influence in academia and industry but also enables them to make positive contributions to society by sharing professional knowledge and experience, promoting interdisciplinary collaboration across disciplines, and driving the development of new technologies and innovations.

Professor Zhou Wanlei, Vice Rector of City University of Macau and Dean of the Faculty of Data Science, has gained widespread recognition for his outstanding contributions in cybersecurity and privacy protection. In November 2024, he was elected as an IEEE Fellow. As of November 2024, four full-time academic staff members from the faculty have been included in the "World's Top 2% Scientists" list released by Stanford University and Elsevier, including:

- Dean Zhou Wanlei and Associate Dean Zhu Tianqing, who were selected for both the "Lifetime Scientific Influence List" and the "Annual Scientific Influence List";

- Dr. Ying Zuobin, Program Director of the Doctoral Program, and Assistant Professor Lai Shuying, who were selected for the "Annual Scientific Influence List."

These achievements highlight the outstanding performance of the Faculty of Data Science in academic research and talent cultivation, while also reflecting its continuously expanding international influence in related fields.

Table 18. Jobs in professional organizations

<table>
<tr><th>Name of Society/Organization</th><th>Position</th><th>Academic Staff</th></tr>
<tr><td>Institute of Electrical and Electronic Engineers (IEEE)</td><td>Fellow</td><td rowspan="3">Professor Zhou Wanlei</td></tr>
<tr><td>Macau Association for Promotion of Science and Technology</td><td>Vice President</td></tr>
<tr><td>Macau Science and Technology Committee</td><td>Member</td></tr>
<tr><td>Macau Association for Promotion of Science and Technology</td><td>Director</td><td rowspan="2">Associate Professor Liu Wenjian</td></tr>
<tr><td>Macau Association for the Promotion of Higher Education</td><td>Director</td></tr>
</table>

Guangdong Provincial Association for Science and Technology	Special Invited Members from Hong Kong and Macau	
The delegation of Chengdu Chinese Overseas Friendship Association	Director	
Association of Cultural and Educational Interchange, Macau	Vice Chairman and Secretary General	
Smart City Alliance Association of Macau	Supervisor	
Macau Science and Technology Innovation Education Association	Vice President	
Key Laboratory for Cantonese Corpus Construction and Large Model Evaluation	Academic Committee	
Yunnan Key Laboratory of Software Engineering	Member, Distinguished Professor	
IEEE Macau Section Council	Chair of Membership Development Committee; Council Member	Associate Professor Ying Zuobin
Institute of Electrical and Electronics Engineers (IEEE)	Member	
Chinese Computer Federation (CCF)	Member	
Blockchain Professional Committee, Chinese Society for Industrial and Applied Mathematics	Committee Member	
Guangdong Province Technology Business Incubator Association	Guangdong Province Entrepreneurship Mentor	
Macau Bay Area Digital Economy Association	Vice President	Assistant Professor Kuok Weng Tak
Macau Bay Area Digital Economy Association	Vice President	Assistant Professor Kong Hoi Io
Shandong Provincial Youth Federation	Committee Member	
Institute of Electrical and Electronics Engineers (IEEE)	IEEE Senior Member	Professor Gu Jia
Computational Intelligence and Applications Professional Committee, Chinese Association of Automation	Deputy Secretary-General	
Macau Society of Digital Medicine and Artificial Intelligence	Council Member	
Institute of Electrical and Electronics Engineers (IEEE)	IEEE Senior Member	Professor Sun Xin

Computational Intelligence and Applications Professional Committee, Chinese Association of Automation	Deputy Director	Associate Professor Duan Junwei
Guangdong Province Big Data Collaborative Education and Application Innovation Engineering Technology Research Center	Deputy Director	
Institute of Electrical and Electronics Engineers (IEEE)	IEEE Senior Member	
Institute of Electrical and Electronics Engineers of Macau (IEEE Macau)	Council Member	

Strategic planning and future direction

Vision and Mission Statement

The Faculty of Data Science is committed to building itself into a leading platform for high-level data science research and education in Macau and a core one in the Greater Bay Area. By exploring cutting-edge technologies to promote interdisciplinary collaboration and the cultivation of innovative talents, the faculty aims to drive the widespread application of data science in scientific research, industry, and social services, providing strong talent support, educational resources, and intellectual support for the sustainable development and digital transformation of the Greater Bay Area. The faculty will closely collaborate with all sectors to advance knowledge innovation and technological applications in the field of data science. Upholding the glorious tradition of patriotism and love for Macau at City University of Macau, it will tell China's stories well and promote Chinese culture. With the mission of "rooted in Macau and integrated into the Bay Area," it integrates into the overall national development strategy, contributing to talent cultivation for the Guangdong-Hong Kong-Macao Greater Bay Area and the nation as a whole.

Goals and objectives for the next few years

In order to realize our vision, we have the following goals in the next 3-5 years:

Project	2027 Plan	2030 Plan
Ranking	Enter the top three professional rankings	Enter the top 300 professional rankings: ESI in the top 1%
Program Applications	Complete applications for Artificial Intelligence and Electronic and Computer Engineering programs	Complete applications for Bachelor of data Science, as well as the Master and Doctor of Intelligence Technology and Services

High-end Talent	70 or more	100 or more；Cultivate 1–2 highly cited scholars.
National Laboratory Applications	Complete the preparatory work for national laboratory/laboratory applications	Establish a national key laboratory or a Guangdong Province key laboratory

Challenges and Opportunities

In the process of pursuing its goals, the Faculty of Data Science faces both challenges and opportunities. In order to realize the development vision of the faculty, we will actively respond to these challenges and seize opportunities to promote the continuous progress of the faculty.

Challenges:

I. Interdisciplinary cooperation and communication

The wide application of data science requires close cooperation with other disciplines, faculties and fields. However, differences in knowledge systems, research methodologies, and terminology across disciplines may pose challenges. Effectively communicating and establishing efficient mechanisms for interdisciplinary collaboration represent a significant challenge for the faculty. The faculty needs to strengthen interdisciplinary dialogue and exchange, integrate the strengths of all parties, and promote collaborative innovation.

II. Technology update and iteration

The field of data science is characterized by rapid advancements in technologies and tools, requiring both faculty and students to maintain continuous enthusiasm for learning and motivation for progress to keep pace with technological developments. At the same time, the faculty will flexibly adjust its curriculum to ensure that teaching content closely aligns with industry needs and technological advancements, thereby enhancing educational quality and strengthening graduates' competitiveness in the job market.

III. Attracting outstanding talents

Attracting the world's top research talents has been a long-term goal of the faculty. As international competition intensifies, effectively attracting and retaining top-tier research talent on a global scale has become a major challenge for the faculty's development. To address this, the faculty will further optimize the allocation of research resources, provide an excellent academic environment and support system, assist newly recruited outstanding talent in smoothly integrating into the faculty culture, and offer them ample research support and development opportunities.

Opportunities:

IV. Rapid development of City University of Macau

In recent years, City University of Macau has embraced historic opportunities for rapid development. With improvements in the international environment and the continuous accumulation of technological resources, the university's educational conditions have been significantly enhanced. The Faculty of Data Science has the opportunity to leverage this broader environment to further strengthen its capabilities in education, research, and talent cultivation. Greater investment in education and societal support have provided the faculty with a solid foundation for sustained development.

V. Rapid development of artificial intelligence and big data

With the rapid development of artificial intelligence and big data technology, the tools and algorithms of data science are becoming increasingly powerful, greatly enhancing the efficiency of data processing and analysis. This provides the faculty with new research directions and application scenarios, while also creating opportunities for innovation. The faculty will seize this opportunity to strengthen collaborations with industry and academia, thereby occupying a more advantageous position in the integration of industry, academia, and research.

VI. The surge in social demand for data science

As digital transformation accelerates, societal demand for data science is rapidly increasing across various sectors. There is an urgent need for high-quality data science talents equipped with professional knowledge and skills in fields such as scientific research, industry, and social services. The Faculty of Data Science can not only cultivate a large number of outstanding graduates for society but also expand employment markets and development opportunities through close cooperation with industry.

Conclusion

In 2025, the Faculty of Data Science at City University of Macau achieved steady progress through collective effort. We fostered a collaborative academic atmosphere by organizing high-level international seminars, lectures, and industry exchanges, providing platforms for global engagement and innovative thinking. Team-building activities strengthened internal cohesion.

In terms of teaching, the team actively optimized and perfected the academic system of the faculty's programs, incorporating cutting-edge knowledge and practical case studies to ensure that teaching content remains current. Teachers diligently guided students in participating in research projects and various professional competitions, cultivating students' innovative abilities and skills in solving complex problems, resulting in outstanding achievements.

In research, the team published multiple high-quality papers in top international journals and conferences, achieving breakthrough progress in key areas such as artificial intelligence, big data analytics, cybersecurity, and privacy computing. Faculty members also successfully secured multiple government- and industry-funded research projects, demonstrating strong research competitiveness.

In terms of external collaboration, the faculty actively expanded strategic partnerships with renowned universities, research institutions, and leading enterprises both domestically and internationally. Through signing memoranda of cooperation, establishing joint laboratories, and promoting faculty and student exchanges, the faculty facilitated the sharing and integration of academic resources, research data, and cutting-edge achievements. These collaborations not only enhanced the faculty's research capabilities and international visibility but also brought students richer internship opportunities and broader development prospects.

In terms of talent, the faculty was delighted to welcome several outstanding new members to its teaching and research team. These new colleagues brought interdisciplinary expertise and diverse international perspectives, injecting fresh vitality into program innovation and research projects, further enriching the faculty's talent pool and laying a solid foundation for future leapfrog development.

We extend our gratitude to all colleagues, students, partners, and members of society for their support and trust in the Faculty of Data Science throughout 2025. Looking ahead to 2026, the Faculty of Data Science will stand at a new starting point for development, continuing to deepen academic and industry collaborations with partners in the Greater Bay Area and around the world. It will focus on major challenges in frontier areas of data science, striving to produce original research outcomes with international influence. At the same time, the faculty will innovate its educational models to higher standards, perfecting a vertical talent cultivation system from undergraduate to doctoral levels, and committing to building the faculty into a globally recognized hub for digital science education and research.

Appendix

Faculty of Data Science papers and monographs published in 2025

1. ACMSI: An Innovative Automated Analysis Application Utilizing Computer Vision for Accurate Microsatellite Instability Classification, ISBRA2025
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