

Judging the Trend of Curriculum Development Based on Correlation Analysis Algorithm

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Abstract—Emerging Engineering Education began in 2017. With the positive response of education departments and universities, the construction of Emerging Engineering Education courses is making progress. Facing the courses with different research directions, how to find out the internal relations and correlation characteristics between them with scientific algorithms is the necessary premise for universities to open multiple Emerging Engineering Education courses. We collected the data of big data and AI related professional courses offered by domestic colleges and universities in the past five years, and used these data as samples for statistical analysis and calculation. With the famous data statistical analysis software IBM SPSS as a tool, we used the results obtained from the correlation analysis algorithm as the basis for inferences made a scientific analysis of their correlation and made a judgment on their development trend. These results obtained by this inference algorithm are detailed and reliable, and have certain value in popularization and application.

Keywords-correlation analysis and algorithms; statistical inference and prediction; application of IBM SPSS; the development trend of Emerging Engineering Education curriculum

1 INTRODUCTION

AI, the name for an emerging discipline, was formally proposed at the Dartmouth conference in 1956, and its developmental course, although it can be attributed to three stages of gestation, formation, and development, is still well recognized by industry as that year being the Meta Year of AI technology development. With the progress of the times, it has now been recognized that the following three points: first, mathematical based theoretical research is indispensable for AI technology; Their second is that the development of AI technologies is to rely on computer devices with super-computing and data analysis capabilities, and their third is the R & D field of modern science and technology, which is compatible and communicate. Beyond that, of course, and more importantly, it has been recognized that: including the AI technology itself, all progress with the age, with different understandings. A more comprehensive view of AI technologies began in the 1970s. It is now recognized that: intelligent technology is a burgeoning disciplinary field on the basis of multidisciplinary studies in computer science, cybernetics, information science, Neurology, philosophy, and linguistics. From an engineering perspective, AI is to use artificial methods to enable machines with functions related to human intelligence, such as: judgment, reasoning, proof, perception, understanding, thinking, recognition, planning, design, learning, and problem-solving, among other thinking activities. In that computer era, the scientific and technical workers, keen

research questions mainly focus on how to improve the work efficiency of computers through parallel computing, distributed storage, and distributed computing. And AI technology researching, mainly focused on how various sectors can create expert systems or assist decision systems to replace or partially replace people's mental work and improve work efficiency [1].

2 DEVELOPMENT OVERVIEW

In April 2018, in order to implement the document (GF [2017] No. 35), the notice of the State Council on printing and distributing the development plan of the new generation of artificial intelligence is to guide colleges and universities to aim at the forefront of world science and technology, continuously improve the scientific and technological innovation ability, talent training ability and international cooperation and exchange ability in the field of artificial intelligence, and provide strategic support for the development of the new generation of artificial intelligence in China. The Ministry of education specially formulated the action plan for artificial intelligence innovation in Colleges and universities and issued a notice. Therefore, colleges and universities actively carry out curriculum construction and teaching research of artificial intelligence specialty [2].

The situation of domestic colleges and universities in recent years is summarized as follows.

We use symbols A, B, C, D, E, F to represent the names of big data undergraduate majors, artificial intelligence undergraduate majors, big data Junior college, artificial intelligence Junior college, big data majors (including vocational colleges) and artificial intelligence majors (including vocational colleges), as shown in the following table. The data in the table are from information on the Internet in China.

TABLE I. STATISTS DATAS

year	A	B	C	D	E	F
2016	3				3	
2017	32	5	64		96	5
2018	253	35	212		465	35
2019	256	180	460	171	716	351
2020	231	218	619	821	850	1039

We use the professional data statistical analysis software IBM SPSS as a tool to make a detailed analysis of the above tables. Through the analysis algorithm of the correlation between the data, quite useful analysis results are obtained. These results can reveal and guide us to carry out the teaching reform of artificial intelligence curriculum system, that is, when we plan and formulate the curriculum system of colleges and universities, we should comprehensively consider the overall needs of national construction for all kinds of professional talents according to the overall national plan, and improve the talent training plans at different levels, In order to meet the needs of current national construction.

3 ALGORITHM AND OPERATION PROCESS

The operation steps are as follows.

First, select the data input operation as shown in Figure 1.

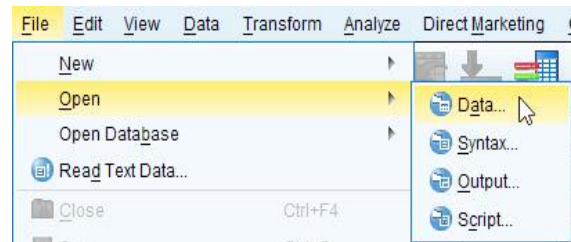


FIGURE 1 OPERATION OF DATA INPUT

Next, we select the data type of the input data, as shown in Figure 2.



FIGURE 2 SELECT THE TYPE OF INPUT DATA

When we choose to use this Excel type data table, the next step is to determine the location of the first row of data in the data table. The specific operations are shown in the following Figure 3. This operation determines all sample data to be statistically analyzed.

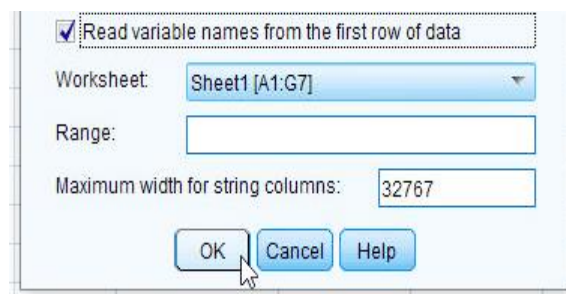


FIGURE 3 DETERMINES THE LOCATION OF THE DATA IN THE TABLE

Next, we should select the data analysis option in Figure 4. The data to be analyzed is the initial data sample listed in Table 1. These data samples are collected by the author on the Chinese Internet.



FIGURE 4 THE OPTION OF DATA ANALYSIS

Next, we should select the option of data correlation analysis in Figure 5. The data listed in Figure 5 is the initial data sample we determined.

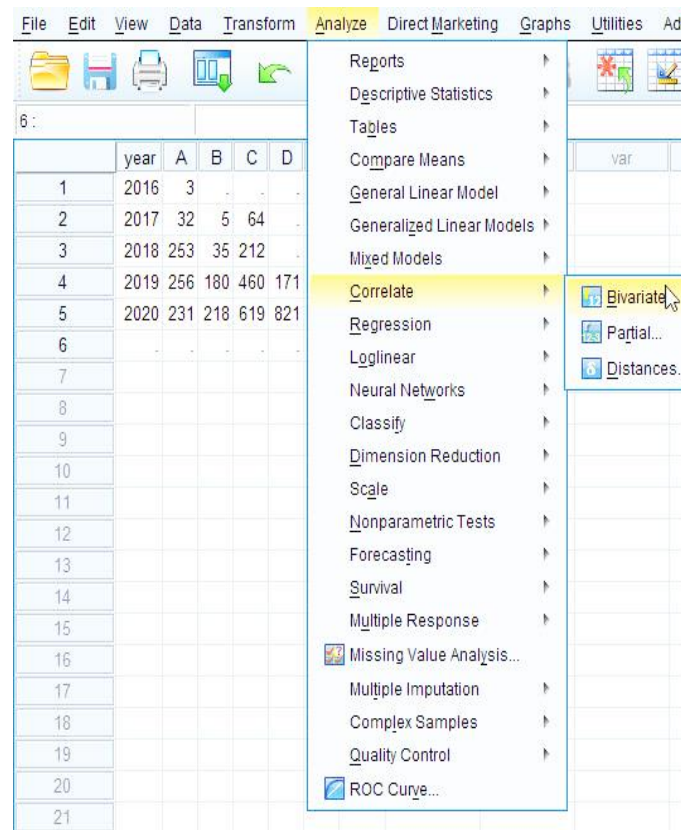


FIGURE 5 THE OPTION OF DATA CORRELATION ANALYSIS

As shown below, Figure 6 is option determine the data-set for analysis.

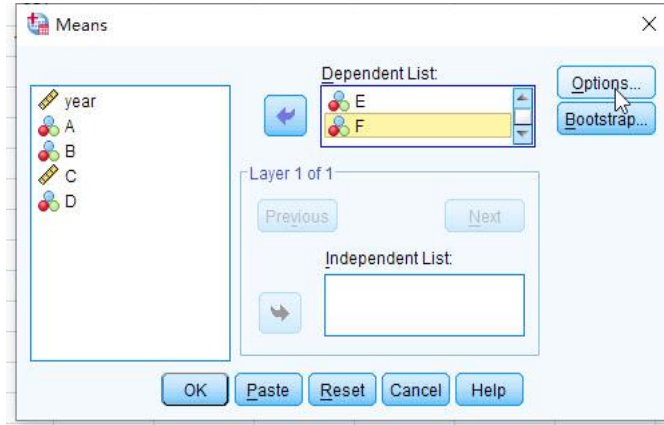


FIGURE 6 THE OPTION DETERMINE THE DATA-SET FOR ANALYSIS

The calculation results are as follows.

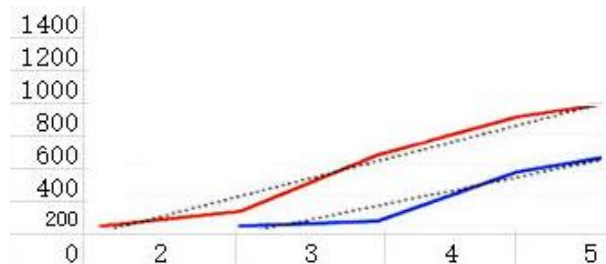
TABLE II. RELEVANT ANALYSIS DATAS

		E	F
E	Pearson Correlation	1	0.818
	Sig.(2-tailed)		1.82
	N	5	4
F	Pearson Correlation	0.818	1
	Sig.(2-tailed)	0.182	
	N	4	4

We have obtained the coefficient of correlation analysis of two variables, which is 0.818 in Table 2.

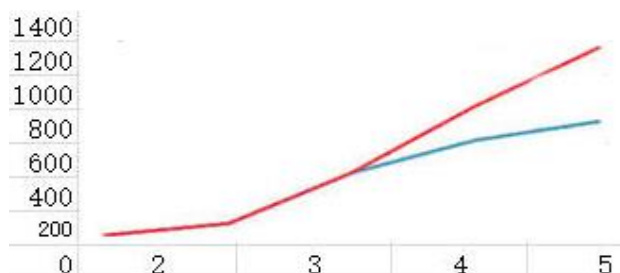
The conclusion is that there is a close correlation between the two variables.

The dotted line shown in Graph 1, this is a linear representation of the growth in the number of AI and big data majors in colleges and universities in recent years. Obviously, these two trend lines are basically linear. These two dotted lines are almost parallel.



Graph 1 DEVELOPMENT TREND OF AI AND BIG DATA SPECIALTY

The ordinate represents the amount of data growth, and each unit is 200; the abscissa represents time, and each unit represents one year in Graph 1. The red curve represents the AI specialty, and the blue curve represents the big data specialty. The changes are clear in the Graph 1.



Graph 2 THE GROWTH OF AI AND BIG DATA SPECIALTY

As shown in Graph 2, the change rate of the red curve is greater than that of the blue curve, which shows that the growth trend of setting AI majors in colleges and universities is greater than that of big data majors in recent years.

As the relevant data analysis results shown in above, we have learned that the professional development of artificial intelligence is moderately related to the professional development of big data. The development process of artificial intelligence specialty is more closely related to the development of data science and big data specialty. In other words, the advent of the era of big data has had a great impact on the development of artificial intelligence technology [3, 4].

Further analysis, we can know the following four research results.

Firstly, in Colleges and universities, the growth of artificial intelligence specialty and big data specialty shows a linear relationship and an upward trend.

Second, in recent years, these two majors have been set up and enrolled in higher vocational colleges, which shows that these two professional technologies are rapidly popularized in China. At the same time, the Graph 2 shows that the growth trend of the number of artificial intelligence specialty in higher vocational colleges is greater than that of big data specialty.

Third, as shown in the above tables and charts, colleges and universities usually start to prepare to set up artificial intelligence courses after establishing and setting up big data courses, and soon apply to the Ministry of education for filing. These data to the development plan formulated by the state and are being reliably implemented.

Fourth, although the research directions of the two disciplines are very different, they complement and promote each other in the field of application.

The above research results enlighten us: when planning and formulating the curriculum system of colleges and universities, we should comprehensively consider the overall needs of national construction for all kinds of professional talents according to the overall national planning, and improve the talent training plans at different levels, to meet the needs of current national construction.

"Precision teaching" is not only an educational concept, but also a teaching method. Based on this, we propose to reset the curriculum system of artificial intelligence specialty, and put forward relevant suggestions for the teaching of key courses.

4 CONCLUSIONS

With the rapid development of China's economy and society, traditional engineering has been increasingly embedded in emerging industries such as artificial intelligence, intelligent manufacturing, robots, cloud computing, etc. How to cultivate new talents to adapt to the development of contemporary engineering field is a challenge facing higher engineering education. In this context, Emerging Engineering Education came into being [5].

The essence and value of Emerging Engineering Education is innovation. This "new" means, on the one hand, the birth of new disciplines, and on the other hand, the intensification of interdisciplinary crossing. If the former is the inevitable result of the development of Internet, big data, artificial intelligence and other new technologies, as well as the application of new materials and new energy, the latter is the localization practice of interdisciplinary vision theory widely recognized internationally. Therefore, in the innovation process of Emerging Engineering Education, it is not only necessary to face action through adaptive innovation, but also needs multidisciplinary integration to bridge the split of foreign knowledge, enhance the interaction between subjects, to cross disciplinary boundaries and break through the barriers between theory and practice [6].

Guangdong Southern Vocational College is a full-time ordinary vocational college registered by the Ministry of Education. It has 13 secondary colleges, including the Institute of Intelligent Manufacturing, the Institute of Artificial Intelligence, the Institute of Construction Engineering, the Institute of Information, and Huawei Cloud College. The construction of Emerging Engineering Education major and the opening of different courses are tasks that must be paid attention to in our school [7].

When building Emerging Engineering Education majors and offering related courses, we have fully considered the relationship and different characteristics of these courses, so when formulating talent training, we can accurately grasp the key points of each plan, highlight the different characteristics of these talent training, and formulate more detailed teaching plans and arrange the contents of these courses according to different social needs [8].

In the teaching reform of Emerging Engineering Education, we use relatively mature data analysis software as a tool, relevant data analysis algorithms, and the analysis results as a reliable basis for analyzing problems to guide the next step of work. This work process is our basic approach to precision teaching today.

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