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Decision Making on Pursuing Computer Science Masters in United States

Chaitali Sunil Sawant
Portland State University

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**Portland State University
Maseeh College of Engineering and Computer Science
Department of Engineering and Technology Management**



**ETM 530/630 – Decision Making
Spring 2019**

Individual Project Paper

**Decision Making on pursuing Computer Science masters in
United States.**

Chaitali Sunil Sawant

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ABSTRACT

Graduate study comprises of sophisticated degree program which focuses on academic mastery or profession. It will build a strong foundation which emphasis on research and practical training. When it comes to pursuing master, there are many options to consider but the most important option is college and your interest. As USA is a home to many of the world's most prestigious universities (including half of the global top 10), and hosts more international students than any other country. The master's degree in USA is mostly research-based which helps the students to build skill set and knowledge that help them grow in carrier. It is about creating future opportunities. Pursuing master is not an easy step, but a considerable amount of homework and efforts which goes under before getting into your dream university. Everyone can pursue masters in their hometown but the opportunities and exposure to knowledge that USA provides us is not always comparable.

There are lot of universities providing great education and opportunities for students. So, we have to consider different parameters like finance, length of the course, safety around the campus, immigration rules, etc. before shortlisting the universities. The approach of this study considers top five universities in USA for pursuing master's in computer science field. Hierarchical Decision Model (HDM) is used to make decision to prioritize the top five universities. And the parameters for the ultimate goal are defined on the basis of extensive research and expert's opinion. To make the decision, ETM-HDM online software is used, which allows the pairwise comparison and ranking to the ultimate goal. The model has four levels: Goal, Criteria, Sub-criteria and Alternatives. Group of 10 experts has provided their rating for decision making.

Experts consists of the industry professional holding US master's degree, current graduate students and graduate aspirants.

The outcome of this model, i.e. the top five universities for pursuing masters were prioritized based on the ranking provided by the experts. Based on the rankings, Massachusetts Institute of Technology (MIT) was the most preferred option. The ranking for the criteria's and sub-criteria's defines the final decision. "Opportunity" is the highly weighted criteria for the ranking in this university. As we all know the investment for master's program is high which can overpower by the opportunities you will get post masters.

The current research report doesn't concentrate on visa requirement or the immigration formalities for international student. The model can be further modified accordingly to concentrate on the above parameters.

INTRODUCTION

The purpose of this study is selecting a university to pursue masters in USA by implementing HDM model. USA is globally dominating for being the most popular university destination for students especially when it comes to graduate education. With some of the best universities in the world, the USA is definitely the place to be if you dream of a career in engineering ^[1]. USA has lot of educational, research and career opportunities out there for students. Universities in US has well-rounded approach to education that you cannot find easily elsewhere ^[2]. There are various prestigious universities within each state in US, which offers broad curriculum and specified courses in a chosen field. Universities in USA has excellent international opportunities, culturally diverse and have excellent support facilities.

There are various elements that changes with respect to the universities like fee structure, length of the course, expense, opportunities, etc. Students can opt for variety of courses and choose their own career path to enhance their learning skills and opportunities. Masters education can be expensive for international students. Even that varies depending on universities. But there are various financial institutes providing loans. Also, universities provide grants, scholarships, etc. to various international students. There are many international student groups available on campus at all the US schools which enables the international students with any required information.

The requirement to pursue masters in US varies according to the universities. Some universities require both GRE and TOEFL/IELTS scores, whereas some requires either of them. But at least one score is compulsory. For international students, financial documents demonstrating adequate financial support for at least the first year of study is required, whereas

this is not mandatory for citizens. Even some universities require essays depending on the course you opt for. Universities require official certified transcripts from each institution, copies of official degree certificate, letter of recommendation and statement of purpose invariable of courses or university you select.

One of the popular master's degree in US is engineering. After completing engineering master, there are many hottest paid jobs available in the market. Master's degree in computer engineering is one of the top master's degree. According to the U.S. Bureau of Labor Statistics, it was one of most in demand degrees since 2006 and was in the top 10 list ^[3]. Almost every universities offers this program but requirement i.e. entrance exam and its scores, length of course i.e. credits, tuition fees, scholarships/grants, etc. varies.

Top universities offering Computer Engineering course according to the world university rankings of 2019 are Massachusetts Institute of Technology (MIT), Boston ranks first on computer engineering. Second is Stanford University, Silicon Valley in California. Third is Carnegie Mellon University, city of Pittsburgh. Forth is University of California, Berkley (UBC) and fifth is Harvard University, Boston ^[4].

This research is implemented by Hierarchical decision model (HDM) for selecting one of the top-ranking universities in US. The parameters to be considered for selecting the universities will be length of the course, total expense, location, job opportunity, scholarship/grant, safety, friend/relatives in nearby locality, etc.

The hierarchical model has five criteria and twenty-one sub-criteria, and five alternatives which were finalized by the researchers after several iterations. Once the model was ready, it was sent to expert who has comprehensive knowledge about the topic for validation. After that,

the structure of the model was implemented in the ETM-HDM online software, developed by Portland State University, and the online link of the generated model was sent to selected experts for their judgement of the various criterion of the model.

METHODOLOGY

The methodology employed in this research is the hierarchical decision model. The model has set of evaluation criteria and sub-criteria among which the best decision is to be made. The result is to select one of the universities for pursuing master in United States. It is an effective tool for dealing with complex decision making and may aid the decision maker to set priorities and make the best decision ^[5]. By reducing complex decisions to a series of pairwise comparisons, and then synthesizing the results, the AHP helps to capture both subjective and objective aspects of a decision ^[5]. The AHP generates a weight for each evaluation criteria on the basis of the decision maker's pairwise comparisons. The higher the weight, the more important is the corresponding criteria. Finally, the AHP combines the criteria weights and the options scores, thus determining a global score for each option, and a consequent ranking. The global score for a given option is a weighted sum of the scores is obtained with respect to all the criteria ^[5].

This research is comprised of qualitative methodology of criteria and sub-criteria in order to develop a model to rank the universities according to the individual preferences. For this study random students or ex-students will be selected to rank their individual preferences. For this, the online Hierarchical decision model designed by Portland State University, Engineering and Technology Management department [ETM-HDM] has been used. It will have criteria and sub-criteria connecting together to compare top five universities for Computer Science field in US.

Under the guidance of Dr. Ramin Neshati the model was created with respective criteria and sub-criteria. The model was built in ETM-HDM online software tool. The final model for decision making is in Fig. 1.

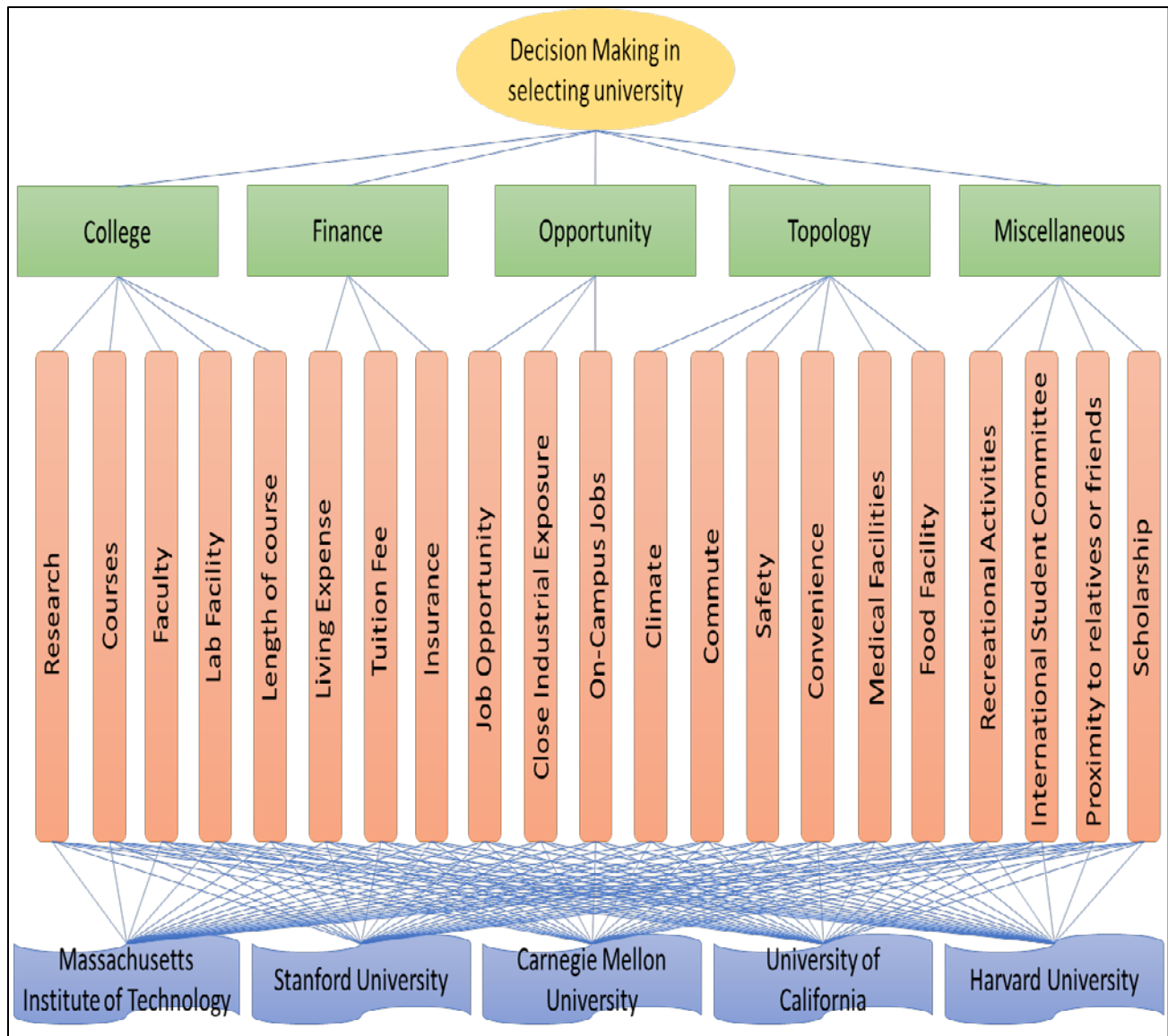


Fig. 1 Final model for decision making

The model has four levels. The levels are research goal, Criteria, Sub-criteria and Universities. First level of this model is the “Decision Making for selecting Universities”; Second level is the four different criteria describing the different parameters to be considered while selecting/ranking any universities. The parameters are College facilities, Finance, Opportunities, Topology and Miscellaneous. Third level is the sub-criteria which provides pair-wise comparison between elements at each level to prioritize the alternatives with each other.

The explanation of the selected criteria and sub-criteria are as follows:

1. **College:**

This criteria includes the facilities that university will provide the students during their master's program. Following is the list of parameters that will help you for your master's education.

1.1 **Research:** How is the research facility at that university? Is the ongoing research being of student's interests? Will the student have an opportunity to conduct close industry research?

1.2 **Courses offered:** What is the course work offered by the university? Is the course work encouraging industrial or project exposure? Whether this course help us better understanding the corporate need?

1.3 **Faculties:** Does the university has good, experienced and knowledgeable faculties? Does the faculty own research which is of aspirant's interest and has research grants?

1.4 **Lab facility:** Does the university provide good lab facilities to the students? Does these facilities expose the aspirants to latest technologies? Is the lab facility effective?

1.5 **Length of course:** How is the length of the course in university? Is it too long or too short? What is aspirants time commitment to learn and be in the university?

2. **Finance:**

This criteria includes all the financial consideration for selecting an university. It consists of amount to be paid to pursue masters in US. This can be analyzed by considering following sub-criteria:

2.1. Insurance: This includes the amount you have to pay for insurance. What all facilities, treatments are covered under the insurance? Which are the hospitals listed under this insurance? What are the different deductibles?

2.2 Tuition Fee: It includes the cost of a tuition fee. As the tuition fee is different for citizen and international student. What is the cost per credit and approximate cost for the entire MS course?

2.3 Living Expense: It includes the living expense. What is the average monthly rent, yearly deposit and utility charges? Is it cheaper to stay on-campus or sharing apartments outside campus?

3. **Opportunity:**

This criteria mentions different opportunities provided by the university. These opportunities will help you to gain industrial exposure or research opportunities that will help you in your career.

3.1 On-campus: Does the university provide any on-campus job opportunity for the student? How much is the pay per hour?

3.2 Close Industrial Experience: Does the coursework help student with close industrial experience? Is the coursework aligned with industry standard practices and technologies? Does the coursework or labs or projects involve working with direct or indirect industry professionals?

3.3 Job Opportunity: How is the opportunities around the university for a computer science student? Does the university organize career fair for students? Does the university provide Job assistance, Interview Mockups and corporate ethics training?

4. **Topology:**

This criteria mentions the availability of nearby resources. The access to groceries, medical facilities, food facility, etc. It considers the overall surrounding or locality around campus.

4.1 Climate: How is the weather in the city/state where the university is located? Are you comfortable with the environment physically and mentally? If yes, then what preparations are needed for such weather conditions?

4.2 Commute: How is the public transport facilities around the university? Do they have any student concessions for public transport? Do the university have internal transportation for students? What are the other modes for travelling, i.e. bicycle, battery operated cycle, rented car, etc.

4.3 Safety: Is the area around the campus or housing safe for students? Does the university offer any safer means of transport during late hours? What is the crime rate of that state?

4.4 Convenience: How convenient is your residence to grocery shops, restaurants, shopping malls, etc.

4.5 Medical Facilities: Is there any good medical facility or hospitals for students near campus or residence?

4.6 Food facility: Is there any good food facility around campus like food cart, restaurants, coffee shops, etc.

5. **Miscellaneous:**

This criteria includes all other aspect which can be taken into consideration while opting for an university.

5.1 Recreational activity: Does university provide any recreational activities or sport facilities for students? Is there any other recreational area nearby which can be visited during leisure time?

5.2 International student committee: Does university have International student committee to help international students with their visa information and convenience specific questions?

5.3 Proximity to relatives and friends: Do you have your relatives or friend in the proximity with the campus? If yes, then will you opt for this option or no?

5.4 Scholarship: Does the university provide any kind of scholarship to the students?

6. Universities:

This section mentions the top five universities in United States for pursuing master's in computer science. The decision is to make in accordance with the criteria's and sub-criteria mentioned above. Taking the individual value into consideration and implementing your preference in HDM tool.

6.1 Massachusetts Institute of Technology: MIT ranks first for master's in computer science. It is located at Cambridge, Massachusetts. Cambridge is the house for many startups like Google, Microsoft and Amazon [6]. Even there are many headquarters and laboratories [6]. There is place called "City of Squares" includes Kendall square also known as "Technology square" which has large office towers and even "Cambridge innovation center", Central square has variety of ethnic restaurants, Harvard square has a shopping area and major bus junction, Porter square has complex red line route, i.e. rail route, Inman square is a home for restaurants, bars, music, etc. , Lechmere square is a junction of shopping mall and Green line terminus[6]. Average annual temperature is 59°F (15 °C). There are lot of recreational places around like Museums,

Public arts, Architecture, Contemporary architecture, Music, Parks and Recreation, etc. Even infrastructure facility is very good as it has various modes of transportation like Roads, Mass transits like Red line and Green line, Cycling, walking on bridge provides pedestrian only connection, Intercity bus and train stations. **Even police and fire departments are very good.** Graduate tuition fee for 2017-2018 is \$49,580, Housing on-campus is \$8,253 - \$18,135, Meals (on-campus) is \$3,310 - \$5,150. There are some additional expenses like Books and supplies: \$2,816, Food (off-campus): \$4,634, Local transportation: \$2,736, Personal expenses: \$5,250, Extended health insurance plan: \$3,000. So, the total estimate for a year is \$76,891 - \$91,613 ^[7].

6.2 Stanford University: Stanford ranks second for master's in computer science. It is located at Stanford, Northern California's dynamic "Silicon Valley" home to Yahoo!, Google, Hewlett-Packard, Facebook, Amazon, Apple and many other cutting-edge companies that were started by and continue to be led by Stanford alumni and faculty ^[8]. California is the third largest state of USA by area. There are lot of recreational places in California. It has one of the longest bay areas, i.e. Greater Los Angeles Area and the San Francisco Bay Area. There is wide range of coastal mountain ranges lies in the California central valley they are Cascade Range and Tehachapi Mountains. California has Yosemite Valley, famous for its glacially carved domes, and Sequoia National Park, home to the giant sequoia trees, i.e. Redwoods, the largest living organisms on Earth, and the deep freshwater lake. Lake Tahoe, the largest lake in the state by volume. There is a place called Death Valley, which contains the lowest and hottest place in North America. This region experiences warm (but not hot) and dry summers, with no average monthly temperatures above 71.6 °F (22 °C) ^[9]. It is one of the culturally diverse state. California is known for its car culture for transport. They have good connectivity and inter-connectivity to highways

that offers an impressive view. Golden bridge is the longest suspension bridge, is a popular tourist attraction. It also accommodates pedestrians and bicyclists. They have good arm forces base ^[10]. Stanford university's graduate tuition fee depends upon the number of credits you opt for. More the credits, less will be the price of per unit. So, for 11-18 credits it is \$17,493 and for 8-10 credits it is \$11,370 for master's in computer science ^[11]. Standard budget for 2019-2020 is: Housing rent is \$19,300 which is comparatively cheaper than off-campus by 10% – 40%, Meals is \$8,000, personal expense is \$8,300, Transportation is \$1,740, books and supplies is \$1,300, Campus health service is \$896, Cardinal care health insurance is \$5,592. So, total estimate without tuition fee is \$78,342-97,607 ^[12].

6.3 Carnegie Mellon University: Carnegie Mellon University ranks third for master's in Computer science. Carnegie Mellon is located at Pittsburgh, Pennsylvania. Pittsburgh is sixty-third largest city of US. Pittsburg is known as "The Steel City" and has led manufacturing of aluminum, glass, shipbuilding, petroleum, foods, sports, transportation, computing, autos, and electronics. Today, Google, Apple Inc., Bosch, Facebook, Uber, Autodesk, Microsoft and IBM are among 1,600 technology firms generating \$20.7 billion in annual Pittsburgh payrolls. It has federal agency headquarters for various cyber defense, software engineering, robotics, energy research and the nuclear navy. Pittsburg is famous for its golden triangle consist of various 30 500 ft skyscraper, rail system, bridges and port authority. There are various recreational places like museum, parks, event center, science center, aviary, mattress factory and Allegheny river. The region experiences often humid, and temperature ranges from -18 °C in winter to 22.6 °C in summer. Pittsburg ranks sixth at American Lung Association. It is very famous for art and culture, has various forms of entertainment, various theatre, literature forms, local dialect, livability.

Pittsburg is famous for sports, they rank There are various places for recreation like first in professional football game and even good at Baseball, Hockey, Basketball, Golf and Professional wrestling. **Pittsburg ranks first for safest city of US. There are two largest health care providers.** Even transportation is good at Pittsburg. They have good rail, Port, Expressway, Airports and Public transit ^[13]. Graduate tuition fee for academic year is \$48,500. Per unit price is \$674. Student activity fee is \$218, Room is \$9,826, Board is \$5894, Book and supplies is 2212, Health insurance is \$2685, Personal and Misc.is 2750, travel allowance is 1180, transportation is 224, technology fee is \$430 which totals to \$25,419. So, the total expense would be \$73,919 ^[14].

6.4 University of California: University of California ranks four in USA for master's in computer science. It is located at Berkley, California. Berkley is on the east shore of San Francisco Bay. There are various places for recreation like Strawberry creek, Grizzly peak, Berkley hills, Pacific coast ranges, Golden Gate, Indian Rock Park, etc. The cost of living is increasing in Bay area. Berkley has a cool Mediterranean climate, with dry summers and wet winters. Average temperature ranges from 32.2 °C to 0 °C. Average annual precipitation is 25.40 inches. There are lot of homeless people in Berkley, political activism of UC, Berkley has taken steps to remove homeless people over the period of time. Berkley has various forms of transportation like Amtrak, AC Transit, BART, east shore freeway and bus shuttle. Berkeley has one of the highest rates of bicycle and pedestrian commuting in the nation. Berkeley is the safest city of its size in California for pedestrians and cyclists ^[15]. Graduate tuition fee for an academic year is \$14,132. Housing and utility is \$15,442, Food is \$7,116, Book and supplies is \$354, Personal expense can be \$2,214, Transportation can be \$2,612. Health insurance is \$15,102. So, the total expense would be \$57,110 ^[16].

6.5 Harvard University: Harvard university ranks fifth in USA for master's in computer science. It is located at Cambridge, Massachusetts. Tuition fee for two years is \$48,008. Insurance is \$4,906, facility fee is \$3,178. Books and supplies will be \$900, apartment will be \$16,700, meals cost is \$6,310, miscellaneous is \$6470. So, the total expense would be \$62,468 ^[17].

Summarizing the annual cost of top five universities is as follows:

Summary of criteria/sub-criteria used in the model was shared with the experts. It is attached in the appendix 1.

DATA AND DATA SOURCE(S)

This study has top five ranking options for pursuing master's in computer science in USA with criteria and sub-criteria finalized by an extensive review of literature and information provided by the experts on pursuing masters. Here, ETM-HDM model is used to do the refined analysis.

Expert Panel:

To rank the options in HDM tool, an expert panel of ten experts in Computer Science field with extensive knowledge and experience on different aspects or options have been selected to evaluate and weight the different parameters over the other. Here, experts have ranked the parameters on the ETM-HDM online tool to evaluate the model. The ultimate result was the pairwise comparison of each options was established for decision making. Fig. 2 shows the distribution Background and qualification who submitted their evaluation in this study.

Fig. 2 Background and Qualification of expert panel

Expert	Background	Completed master	Pursuing Masters	Planning to Pursue
Expert 1	Student			✓
Expert 2	Working as developer	✓		
Expert 3	Student		✓	
Expert 4	Student			✓
Expert 5	Working as security analyst			✓
Expert 6	Working as SRE	✓		
Expert 7	Student			
Expert 8	Working as developer	✓	✓	
Expert 9	Student		✓	
Expert 10	Working as SRE	✓		

ANALYSIS AND KEY FINDINGS

The data is collected in a model by expert and weights are given accordingly. The screen shot for actual model of ETM-HDM model is shown in Appendix A. Below is a table which shows the experts ranking for criteria towards the goal and sub-criteria towards the criteria. The data is further normalized, i.e. sub-criteria towards the goal.

The table of final results of the ETM-HDM model and pairwise comparison from the experts are shown in Appendix B.

Fig. 3 Overall view of the weights for the criteria and sub-criteria

	Title	Weight (Criteria to Goal)	Weight (sub-criteria to Criteria)	Normalized weight (Sub-criteria to Goal)
D	Decision making on pursuing masters in USA	1		
C	COLLEGE	0.26		
SC	RESEARCH		0.30	0.061
	COURSE		0.17	0.033
	FACULTY		0.15	0.030
	LAB FACILITY		0.14	0.028
	LENGTH OF COURSE		0.24	0.049
C	FINANCE	0.20		
SC	INSURANCE		0.28	0.056
	TUITION FEE		0.43	0.087
	LIVING EXPENSE		0.28	0.056
C	OPPORTUNITY	0.29		
SC	JOB OPPORTUNITY		0.73	0.147
	CLOSE INDUSTRIAL EXPOSURE		0.13	0.027
	ON CAMPUS		0.13	0.027
C	TOPOLOGY	0.13		
SC	CLIMATE		0.07	0.014
	COMMUTE		0.16	0.031
	SAFETY		0.33	0.066
	CONVENIENCE		0.13	0.026
	MEDICAL FACILITY		0.21	0.041
	FOOD FACILITY		0.10	0.021
C	MISCELLENEOUS	0.13		
SC	RECREATIONAL ACTIVITY		0.05	0.011
	ISS		0.10	0.019
	PRXIMITY TO RELATIVES		0.06	0.011
	SCHOLARSHIP		0.79	0.158
	Disagreement		0.43	

Based on the result of the Fig. 3 and Fig. 4, most of the experts have ranked “**Opportunities**” as the most important aspect, i.e. **0.29** when compared with other criteria for selecting an university. “**College**” is the second preferred preference, i.e. **0.26** followed by “**Finance**” is **0.20** and “**Topology**” and “**Miscellaneous**” were **0.13** ranked equal.

Fig. 4 Criteria weights based on experts’ opinions

	COLLEGE	FINANCE	OPPORTUNITY	TOPOLOGY	MISCELLENEOUS
EXPERT 1	0.32	0.27	0.26	0.09	0.07
EXPERT 2	0.2	0.2	0.2	0.2	0.2
EXPERT 3	0.2	0.2	0.2	0.2	0.2
EXPERT 4	0.27	0.16	0.45	0.06	0.06
EXPERT 5	0.32	0.16	0.34	0.11	0.07
EXPERT 6	0.2	0.2	0.2	0.2	0.2
EXPERT 7	0.43	0.23	0.27	0.08	0.09
EXPERT 8	0.25	0.2	0.32	0.12	0.11
EXPERT 9	0.2	0.2	0.2	0.2	0.2
EXPERT 10	0.19	0.21	0.46	0.08	0.06
MEAN	0.26	0.20	0.29	0.13	0.13

Based on the final result as shown in Appendix A and Fig. 3, Scholarship, Job Opportunity, Tuition Fee and Safety are the top 4 sub-criteria having relative ranking of 0.158, 0.147, 0.87 and 0.66 respectively. The final result of relative weight and the alternatives is shown in Appendix B and Fig. 5 as well. Higher mean weight represents the most preferred option in satisfying the decision level (goal). The resulting analyses indicated that Massachusetts institute of Technology had the highest rank with a weight of 0.32, followed by Stanford university, Carnegie Mellon, University of California and Harvard with weights 0.19, 0.18, 0.17 and 0.14 respectively.

Fig. 5 Relative value of each plan based on the results of the model

EXPERTS	MIT UNIVERSITY	STANFORD	CARNEGIE MELLON	UNIVERSITY OF CALIFORNIA	HARVARD
EXPERT 1	0.32	0.16	0.18	0.19	0.14
EXPERT 2	0.32	0.21	0.18	0.15	0.14
EXPERT 3	0.51	0.16	0.13	0.11	0.09
EXPERT 4	0.27	0.24	0.2	0.16	0.13
EXPERT 5	0.23	0.2	0.19	0.21	0.18
EXPERT 6	0.32	0.21	0.18	0.15	0.14
EXPERT 7	0.22	0.18	0.2	0.21	0.19
EXPERT 8	0.2	0.19	0.19	0.22	0.19
EXPERT 9	0.37	0.2	0.16	0.15	0.13
EXPERT 10	0.45	0.18	0.15	0.12	0.1
MEAN	0.32	0.19	0.18	0.17	0.14

On the basis of Fig. 4, “**Opportunity**” is very important perspective for selecting the final goal. Everyone wants to succeed in life and plans for the future accordingly. Pursuing masters in USA is a huge investment but if you are getting returns on your investments then it is worth investing. That’s why job opportunity is given high preference. Second was the “**College**”. It means the reputation, facility, knowledge you gain, that will receive during your masters is important. From the expert’s perspective both are the important elements to be considered for pursuing masters in USA. There are various other elements as well such as investment, locality, etc. But if you opt for masters in one of the renowned university than you will have an significance over others.

The elements selected above are the practical elements among the others. Pursuing masters in “**Massachusetts Institute of Technology**” is a summit. Outcome of this options will be the name/fame of the university, good job opportunity, exposure to the good research, expansion of knowledge, experienced faculty, etc. In MIT, the research credits are more as compared to other university which is very encouraging. During masters the first priority is given

to gaining knowledge through research, even before you get exposed to the industrial opportunities.

Inconsistency and Disagreement

As the value of pairwise comparison relies on subjective judgment, it is necessary to evaluate the consistency of the pairwise comparison between experts before analyzing the decision itself [27]. Here, online ETM-HDM model calculates the inconsistency. Fig. 6 shows the inconsistency of the pairwise comparison of all the expert. All inconsistencies totals to 0.43.

Fig 6 Pairwise inconsistency of expert

Experts	Inconsistency
EXPERT 1	0.04
EXPERT 2	0.03
EXPERT 3	0.02
EXPERT 4	0.03
EXPERT 5	0.02
EXPERT 6	0.02
EXPERT 7	0.02
EXPERT 8	0.03
EXPERT 9	0.03
EXPERT 10	0.03

Disagreement is a process to measure the difference between the experts rating while doing pairwise comparison. Smaller the value indicates the equal preference is given to all the elements throughout the model. If the disagreement is 0 then reliable assessment is done. Here highest inconsistency is 0.04 but is reliable as the rating for the expert value is very close to the decision. Rest experts are ranging from 0.2 to 0.3. The disagreement and the inconsistency results from the experts makes model reliable in ranking the universities preferred for pursuing master in US.

FUTURE RESEARCH

The primary limitation in this study was the number of experts providing their responses. More the number of reliable experts more would have increased the accuracy of the results obtained from the study.

In this model **opportunity** was given the priority followed by college, finance, topology and miscellaneous. But the importance should be given to the exposure to practical experience, industry best practices, tools and methodologies over the university name. We should also consider the back-up plan if the admission or the opportunity doesn't work out as planned. As the investment and commitment is high, so the returns should be accordingly. So, in future model, the parameter of practical experience and back up can be considered.

Secondly, the visa rules for international student changes in accordance to their respective countries. So, future model will have the criteria describing the immigration rules for students in USA. These factors will help making an unbiased decision model which will help experts or decision maker to better understand the current situation and the future problem.

New model will have criteria's and sub-criteria's for both the parameters which will have a positive impact in decision making.

REFERENCES

1. "MS in US." Internet: <https://stupidssid.com/ms-in-us>, [April 22, 2019].
2. "Masters in USA." Internet: <https://www.masterstudies.com/USA/>, [April 22, 2019]
3. "The Best Master's Degrees", Internet: <https://www.bestmastersdegrees.com/masters-degrees-that-pay-the-most>. [April 23, 2019]
4. Sabrina Collier. "Top Computer Science Schools in the US in 2019", Internet: <https://www.topuniversities.com/university-rankings-articles/university-subject-rankings/top-computer-science-schools-us-2019>, Feb 27, 2019. [April 23, 2019].
5. "The Analytic Hierarchy Process", Internet: http://www.dii.unisi.it/~mocenni/Note_AHP.pdf. [April 30, 2019]
6. "Cambridge, Massachusetts", Internet: https://en.wikipedia.org/wiki/Cambridge,_Massachusetts#Sister_Cities_-_Twin_Towns. [May 8, 2019]
7. "MIT Graduate Admission", Internet: <http://gradadmissions.mit.edu/costs-funding/expenses>. [May 8, 2019]
8. "Where is Stanford?", Internet: <http://visit.stanford.edu/basics/>. [May 8, 2019]
9. "Stanford, California", Internet: https://en.wikipedia.org/wiki/Stanford,_California. [May 8, 2019]
10. "California", Internet: <https://en.wikipedia.org/wiki/California>. [May 8, 2019]
11. "Tuition and fees", Internet: <https://registrar.stanford.edu/students/tuition-and-fees/tuition-and-fees-2019-20>". [May 8, 2019]
12. "The student Budget", Internet: <https://financialaid.stanford.edu/grad/budget/index.html>. [May 8, 2019]

13. "Pittsburg", Internet: <https://en.wikipedia.org/wiki/Pittsburgh>. [May 8, 2019]
14. "Student Financial Services", Internet: <https://www.cmu.edu/sfs/tuition/graduate/cit.html>. [May 8, 2019]
15. "Berkley, California", Internet: https://en.wikipedia.org/wiki/Berkeley,_California#Climate. May 12, 2019.
16. "Cost of Attendance", Internet: <https://financialaid.berkeley.edu/cost-attendance>. May 12, 2019.
17. "Tuition and Fees", Internet: <https://gsas.harvard.edu/admissions/tuition-fees>. May 13, 2019.
18. "General Degree Requirement", Internet: <http://catalog.mit.edu/mit/graduate-education/general-degree-requirements/#mastersdegreertext>. [May 13, 2019]
19. "Computer Science", Internet: <https://exploreddegrees.stanford.edu/schoolofengineering/computerscience/#masterstext> [May 13, 2019].
20. "Harvard College Handbook for Students", Internet: <https://handbook.fas.harvard.edu/book/computer-science>. [May 13, 2019].
21. "Computer Science", Internet: <http://guide.berkeley.edu/graduate/degree-programs/computer-science/computer-science.pdf> [May 13, 2019]
22. "Master's Requirement", Internet: <https://www.csd.cs.cmu.edu/academics/masters/requirements>. [May 13, 2019].

-
23. "Average Weather in Cambridge Massachusetts, United States", Internet:
<https://weatherspark.com/y/26202/Average-Weather-in-Cambridge-Massachusetts-United-States-Year-Round>. [May 13, 2019].
24. "U.S. climate data", Internet:
<https://www.usclimatedata.com/climate/berkeley/california/united-states/usca0087>.
[May 13, 2019].
25. "Average Weather in Stanford California, United States", Internet:
<https://weatherspark.com/y/569/Average-Weather-in-Stanford-California-United-States-Year-Round>. [May 14, 2019].
26. "U.S. Climate data", Internet:
<https://www.usclimatedata.com/climate/pittsburgh/pennsylvania/united-states/uspa3601>. [May 14, 2019].
27. Sulaiman, A. M. (2016), "Consistency Analysis for Judgment Quantification in Hierarchical Decision Model," Dissertations and Theses, Paper 2699.

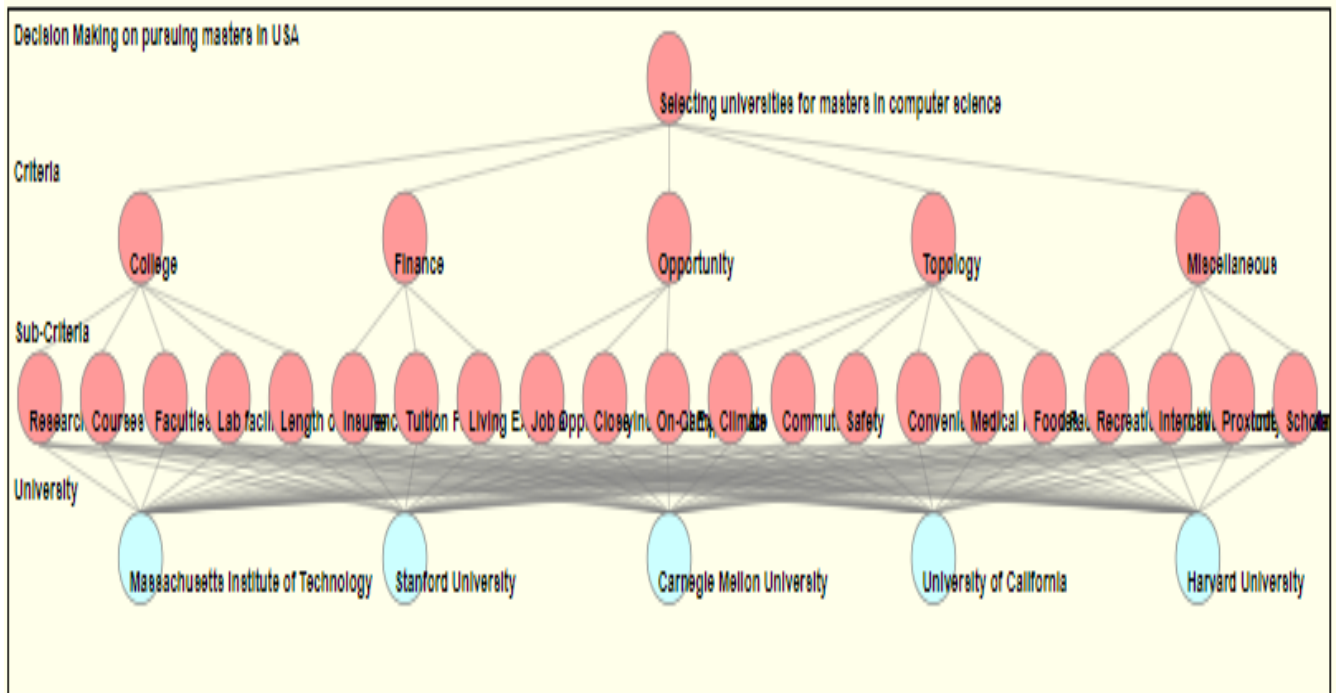
APPENDICES

APPENDIX 1: Analyzed data was shared with the experts to help them in ranking.

<u>University</u>	<u>Tuition fee</u> <u>±</u> <u>additional</u> <u>expense</u>	<u>Annual</u> <u>Insuran</u> <u>ce</u>	<u>Climate</u>	<u>Credits</u> <u>require</u> <u>d</u>	<u>Living</u> <u>Expense</u>	<u>Commute</u>
MIT	\$76,891 - \$91,613	\$12,000	45°F - 73°F [23]	66 [18]	\$13,000	Roads, Mass transits like Red line and Green line, Cycling, walking on weeks bridge provides pedestrian only connection, Intercity bus and train stations
Stanford University	\$78,342- 97,607	\$10,752	58°F - 72°F [25]	45 [19]	\$19.300	They have good connectivity and inter-connectivity to highways that offers and impressive view. Golden bridge is the longest suspension bridge is a popular tourist attraction. It also accommodates pedestrians and bicyclists.
Carnegie Mellon University	\$73,919	\$10,750	42.6°F - 61.4°F Rainfall: 34.8 inch [26]	48 [22]	\$9,826	Good rail, Port, Expressway, Airports and Public transit
University of California	\$57,110	\$15,102	48.4°F- 67.8°F	34 [21]	\$15,448	Amtrak, AC Transit, BART, east shore freeway and bus shuttle. Berkeley has one of the highest

			Rainfall: 26.75 inch ^[24]			rates of bicycle and pedestrian commuting in the nation
Harvard University	\$62,468	\$9,906	45°F - 73°F	40-48 ^[20]	\$16,700	Roads, Mass transits like Red line and Green line, Cycling, walking on weeks bridge provides pedestrian only connection, Intercity bus and train stations

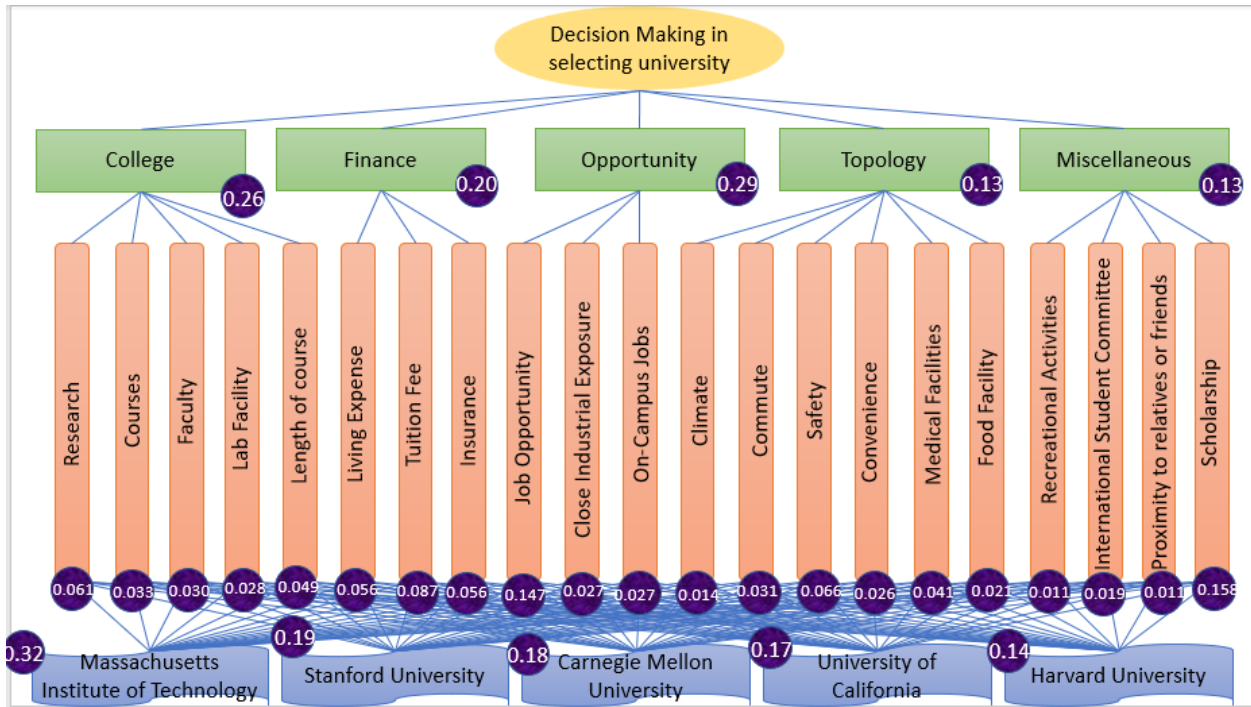
APPENDIX A – FINAL, QUANTIFIED MODEL



Screenshot of running the model in the ETM-HDM online software

Link to the HDM Model:

<http://research1.etm.pdx.edu/hdm2/expert.aspx?id=121baa933dd959d7%2fa857355033f501c2>



Distribution of decision/normalized weights in the entire model

APPENDIX B – AHP/HDM PCM DATA TABLES

Selecting universities for masters in computer science	Massachusetts Institute of Technology	Stanford University	Carnegie Mellon University	University of California	Harvard University	Inconsistency
University	0.32	0.18	0.18	0.19	0.14	0.04
Finance	0.32	0.21	0.18	0.15	0.14	0.03
College	0.51	0.18	0.13	0.11	0.09	0.02
Topology	0.27	0.24	0.2	0.18	0.13	0.03
Miscellaneous	0.23	0.2	0.19	0.21	0.18	0.02
Opportunity	0.32	0.21	0.18	0.15	0.14	0.02
Finance	0.22	0.18	0.2	0.21	0.19	0.02
College	0.2	0.19	0.19	0.22	0.19	0.03
Topology	0.37	0.2	0.18	0.15	0.13	0.03
Miscellaneous	0.45	0.18	0.15	0.12	0.1	0.03
Mean	0.32	0.19	0.18	0.17	0.14	
Minimum	0.2	0.16	0.13	0.11	0.09	
Maximum	0.51	0.24	0.2	0.22	0.19	
Std. Deviation	0.1	0.02	0.02	0.04	0.03	
Disagreement						0.043

The statistical F-test for evaluating the null hypothesis (H₀: $\rho_{ic} = 0$) is obtained by dividing between-subjects variability with residual variability:

Source of Variation	Sum of Square	Deg. of freedom	Mean Square	F-test value
Between Subjects:	0.20	4	.049	14.18
Between Conditions:	0.00	9	0.000	
Residual:	0.12	36	0.003	
Total:	0.32	49		
Critical F-value with degrees of freedom 4 & 36 at 0.01 level:				3.89
Critical F-value with degrees of freedom 4 & 36 at 0.025 level:				3.17
Critical F-value with degrees of freedom 4 & 36 at 0.05 level:				2.63
Critical F-value with degrees of freedom 4 & 36 at 0.1 level:				2.11

Screenshot of the final results of the model

Individual Analysis Result

Expert 1:

Level-1	Selecting universities for masters in computer science				
College	0.32				
Course	0.27				
Opportunity	0.25				
Topology	0.09				
Miscellaneous	0.07				
Inconsistency	0.04				

Level-2	College	Finance	Opportunity	Topology	Miscellaneous
Research	0.63	0.00	0.00	0.00	0.00
Course	0.07	0.00	0.00	0.00	0.00
Facilities	0.00	0.00	0.00	0.00	0.00
Lab facilities	0.24	0.00	0.00	0.00	0.00
Length of course	0.17	0.00	0.00	0.00	0.00
Insurance	0.00	0.47	0.00	0.00	0.00
Tuition Fee	0.00	0.50	0.00	0.00	0.00
Living Expenses	0.00	0.21	0.00	0.00	0.00
Job Opportunity	0.00	0.00	0.14	0.00	0.00
Close Industrial Experience	0.00	0.00	0.13	0.00	0.00
On-Campus Jobs	0.00	0.00	0.15	0.00	0.00
Climate	0.00	0.00	0.00	0.07	0.00
Commute	0.00	0.00	0.00	0.13	0.00
Safety	0.00	0.00	0.00	0.30	0.00
Convenience	0.00	0.00	0.00	0.14	0.00
Medical facilities	0.00	0.00	0.00	0.22	0.00
Food facilities	0.00	0.00	0.00	0.14	0.00
Recreational Activities	0.00	0.00	0.00	0.00	0.03
International Student Community	0.00	0.00	0.00	0.00	0.06
Proximity to Relatives and Friends	0.00	0.00	0.00	0.00	0.04
Scholarship	0.00	0.00	0.00	0.00	0.07
Inconsistency	0.12	0.00	0.00	0.03	0.00

Level-2	Research	Course	Facilities	Lab facilities	Length of course	Insurance	Tuition Fee	Living Expenses	Job Opportunity	Close Industrial Experience	On-Campus Jobs	Climate	Commute	Safety	Convenience	Medical facilities	Food facilities	Recreational Activities	International Student Community	Proximity to Relatives and Friends	Scholarship	
Massachusetts Institute of Technology	0.40	0.40	0.42	0.42	0.07	0.20	0.00	0.40	0.00	0.20	0.10	0.42	0.00	0.20	0.13	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Stanford University	0.17	0.20	0.21	0.20	0.24	0.00	0.40	0.40	0.20	0.20	0.47	0.10	0.10	0.20	0.13	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Carnegie Mellon University	0.15	0.17	0.15	0.15	0.00	0.20	0.10	0.20	0.17	0.20	0.24	0.12	0.10	0.20	0.47	0.20	0.20	0.20	0.20	0.20	0.20	0.20
University of California	0.10	0.10	0.10	0.10	0.40	0.20	0.40	0.12	0.10	0.20	0.20	0.20	0.10	0.10	0.13	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Harvard University	0.07	0.00	0.10	0.00	0.13	0.20	0.20	0.00	0.00	0.20	0.10	0.20	0.11	0.20	0.14	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Inconsistency	0.05	0.01	0.04	0.03	0.17	0.00	0.10	0.00	0.04	0.00	0.00	0.11	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

The final result:

Level-1	Selecting universities for masters in computer science
Massachusetts Institute of Technology	0.34
Stanford University	0.16
Carnegie Mellon University	0.16
University of California	0.10
Harvard University	0.14
Inconsistency	0.04

Expert 2:

Level-1	Selecting universities for masters in computer science																		
College	0.20																		
Finance	0.20																		
Opportunity	0.20																		
Topology	0.20																		
Miscellaneous	0.20																		
Inconsistency	0.00																		

Level-2	College	Finance	Opportunity	Topology	Miscellaneous
Research	0.20	0.00	0.00	0.00	0.00
Courses	0.20	0.00	0.00	0.00	0.00
Faculties	0.20	0.00	0.00	0.00	0.00
Lab facilities	0.20	0.00	0.00	0.00	0.00
Length of course	0.20	0.00	0.00	0.00	0.00
Insurance	0.00	0.33	0.00	0.00	0.00
Tuition Fee	0.00	0.33	0.00	0.00	0.00
Living Expense	0.00	0.33	0.00	0.00	0.00
Job Opportunity	0.00	0.00	0.65	0.00	0.00
Close Industrial Experience	0.00	0.00	0.07	0.00	0.00
On-Campus Jobs	0.00	0.00	0.07	0.00	0.00
Climate	0.00	0.00	0.00	0.10	0.00
Commute	0.00	0.00	0.00	0.13	0.00
Safety	0.00	0.00	0.00	0.31	0.00
Convenience	0.00	0.00	0.00	0.11	0.00
Medical Facilities	0.00	0.00	0.00	0.28	0.00
Food Facilities	0.00	0.00	0.00	0.07	0.00
Recreational Activities	0.00	0.00	0.00	0.00	0.01
International Student Committees	0.00	0.00	0.00	0.00	0.01
Proximity to Relatives and Friends	0.00	0.00	0.00	0.00	0.01
Scholarship	0.00	0.00	0.00	0.00	0.07
Inconsistency	0.00	0.00	0.00	0.10	0.00

Level-3	Research	Courses	Faculties	Lab facilities	Length of course	Insurance	Tuition Fee	Living Expense	Job Opportunity	Close Industrial Experience	On-Campus Jobs	Climate	Commute	Safety	Convenience	Medical Facilities	Food Facilities	Recreational Activities	International Student Committees	Proximity to Relatives and Friends	Scholarship
Massachusetts Institute of Technology	0.08	0.25	0.20	0.20	0.20	0.20	0.27	0.27	0.05	0.48	0.20	0.24	0.47	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Stanford University	0.21	0.25	0.20	0.20	0.20	0.30	0.20	0.22	0.22	0.19	0.24	0.20	0.37	0.17	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Carnegie Mellon University	0.10	0.23	0.20	0.20	0.19	0.20	0.25	0.24	0.09	0.14	0.20	0.16	0.15	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
University of California	0.07	0.14	0.20	0.20	0.13	0.20	0.15	0.15	0.05	0.08	0.20	0.15	0.11	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Harvard University	0.04	0.10	0.20	0.20	0.09	0.09	0.20	0.11	0.11	0.03	0.08	0.20	0.09	0.09	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Inconsistency	0.00	0.07	0.00	0.00	0.07	0.00	0.05	0.05	0.08	0.10	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

The final result:

Level-1	Selecting universities for masters in computer science																		
Massachusetts Institute of Technology	0.32																		
Stanford University	0.21																		
Carnegie Mellon University	0.18																		
University of California	0.15																		
Harvard University	0.14																		
Inconsistency	0.03																		

Expert 3:

Level-1	Selecting universities for masters in computer science																		
College	0.20																		
Finance	0.20																		
Opportunity	0.20																		
Topology	0.20																		
Miscellaneous	0.20																		
Inconsistency	0.00																		

Level-2	College	Finance	Opportunity	Topology	Miscellaneous
Research	0.20	0.00	0.00	0.00	0.00
Courses	0.20	0.00	0.00	0.00	0.00
Faculties	0.20	0.00	0.00	0.00	0.00
Lab facilities	0.20	0.00	0.00	0.00	0.00
Length of course	0.20	0.00	0.00	0.00	0.00
Insurance	0.00	0.33	0.00	0.00	0.00
Tuition Fee	0.00	0.33	0.00	0.00	0.00
Living Expense	0.00	0.33	0.00	0.00	0.00
Job Opportunity	0.00	0.00	0.67	0.00	0.00
Close Industrial Experience	0.00	0.00	0.17	0.00	0.00
On-Campus Jobs	0.00	0.00	0.17	0.00	0.00
Climate	0.00	0.00	0.00	0.08	0.00
Commute	0.00	0.00	0.00	0.28	0.00
Safety	0.00	0.00	0.00	0.24	0.00
Convenience	0.00	0.00	0.00	0.14	0.00
Medical Facilities	0.00	0.00	0.00	0.16	0.00
Food Facilities	0.00	0.00	0.00	0.11	0.00
Recreational Activities	0.00	0.00	0.00	0.00	0.14
International Student Committees	0.00	0.00	0.00	0.00	0.19
Proximity to Relatives and Friends	0.00	0.00	0.00	0.00	0.09
Scholarship	0.00	0.00	0.00	0.00	0.08
Inconsistency	0.00	0.00	0.00	0.01	0.02

Level-3	Research	Courses	Faculties	Lab facilities	Length of course	Insurance	Tuition Fee	Living Expense	Job Opportunity	Close Industrial Experience	On-Campus Jobs	Climate	Commute	Safety	Convenience	Medical Facilities	Food Facilities	Recreational Activities	International Student Committees	Proximity to Relatives and Friends	Scholarship
Massachusetts Institute of Technology	0.09	0.47	0.35	0.35	0.35	0.35	0.57	0.48	0.06	0.77	0.37	0.39	0.67	0.20	0.20	0.20	0.20	0.41	0.20	0.20	0.20
Stanford University	0.02	0.23	0.02	0.15	0.08	0.18	0.20	0.18	0.15	0.12	0.20	0.33	0.38	0.20	0.20	0.20	0.20	0.27	0.20	0.20	0.20
Carnegie Mellon University	0.01	0.10	0.01	0.10	0.00	0.12	0.12	0.17	0.09	0.07	0.12	0.10	0.13	0.20	0.20	0.20	0.20	0.11	0.20	0.20	0.20
University of California	0.01	0.10	0.01	0.07	0.04	0.08	0.07	0.10	0.06	0.04	0.08	0.12	0.06	0.20	0.20	0.20	0.20	0.12	0.20	0.20	0.20
Harvard University	0.01	0.06	0.01	0.04	0.02	0.00	0.05	0.08	0.04	0.02	0.04	0.07	0.06	0.20	0.20	0.20	0.20	0.09	0.20	0.20	0.20
Inconsistency	0.01	0.04	0.01	0.05	0.02	0.07	0.02	0.07	0.03	0.01	0.02	0.02	0.03	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00

The final result:

Level-1	Selecting universities for masters in computer science																		
Massachusetts Institute of Technology	0.51																		
Stanford University	0.16																		
Carnegie Mellon University	0.13																		
University of California	0.11																		
Harvard University	0.09																		
Inconsistency	0.02																		

Expert 4:

Level-1	Selecting universities for masters in computer science					
College	0.27					
Finance	0.16					
Opportunity	0.45					
Topology	0.06					
Miscellaneous	0.06					
Inconsistency	0.06					

Level-2	College	Finance	Opportunity	Topology	Miscellaneous
Research	0.31	0.00	0.00	0.00	0.00
Courses	0.21	0.00	0.00	0.00	0.00
Facilities	0.11	0.00	0.00	0.00	0.00
Lab facilities	0.09	0.00	0.00	0.00	0.00
Length of course	0.20	0.00	0.00	0.00	0.00
Insurance	0.00	0.33	0.00	0.00	0.00
Tuition Fee	0.00	0.33	0.00	0.00	0.00
Living Expense	0.00	0.33	0.00	0.00	0.00
Job Opportunity	0.00	0.00	0.76	0.00	0.00
Close Industrial Experience	0.00	0.00	0.13	0.00	0.00
On-Campus Jobs	0.00	0.00	0.11	0.00	0.00
Climate	0.00	0.00	0.00	0.02	0.00
Commute	0.00	0.00	0.00	0.09	0.00
Safety	0.00	0.00	0.00	0.30	0.00
Convenience	0.00	0.00	0.00	0.08	0.00
Medical Facilities	0.00	0.00	0.00	0.02	0.00
Food Facilities	0.00	0.00	0.00	0.06	0.00
Recreational Activities	0.00	0.00	0.00	0.00	0.01
International Student Committees	0.00	0.00	0.00	0.00	0.04
Proximity to Relatives and Friends	0.00	0.00	0.00	0.00	0.02
Scholarship	0.00	0.00	0.00	0.00	0.03
Inconsistency	0.10	0.00	0.01	0.06	0.01

Level-2	Research	Courses	Facilities	Lab facilities	Length of course	Insurance	Tuition Fee	Living Expense	Job Opportunity	Close Industrial Experience	On-Campus Jobs	Climate	Commute	Safety	Convenience	Medical Facilities	Food Facilities	Recreational Activities	International Student Committees	Proximity to Relatives and Friends	Scholarship	
Massachusetts Institute of Technology	0.45	0.17	0.20	0.20	0.20	0.00	0.20	0.14	0.20	0.36	0.20	0.20	0.13	0.30	0.12	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Stanford University	0.24	0.00	0.20	0.20	0.41	0.20	0.17	0.20	0.22	0.20	0.20	0.42	0.26	0.11	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Carnegie Mellon University	0.14	0.10	0.20	0.20	0.10	0.20	0.32	0.20	0.16	0.20	0.20	0.08	0.18	0.42	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
University of California	0.08	0.08	0.20	0.20	0.22	0.20	0.23	0.20	0.13	0.20	0.20	0.24	0.13	0.12	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Harvard University	0.00	0.08	0.20	0.20	0.14	0.20	0.14	0.20	0.05	0.20	0.20	0.12	0.08	0.12	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Inconsistency	0.14	0.14	0.00	0.00	0.05	0.00	0.06	0.00	0.04	0.00	0.00	0.10	0.26	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

The final result:

Level-1	Selecting universities for masters in computer science
Massachusetts Institute of Technology	0.27
Stanford University	0.24
Carnegie Mellon University	0.20
University of California	0.16
Harvard University	0.13
Inconsistency	0.03

Expert 5:

Level-1	Selecting universities for masters in computer science					
College	0.32					
Finance	0.16					
Opportunity	0.34					
Topology	0.11					
Miscellaneous	0.07					
Inconsistency	0.07					

Level-2	College	Finance	Opportunity	Topology	Miscellaneous
Research	0.40	0.00	0.00	0.00	0.00
Courses	0.12	0.00	0.00	0.00	0.00
Facilities	0.08	0.00	0.00	0.00	0.00
Lab facilities	0.08	0.00	0.00	0.00	0.00
Length of course	0.30	0.00	0.00	0.00	0.00
Insurance	0.00	0.10	0.00	0.00	0.00
Tuition Fee	0.00	0.61	0.00	0.00	0.00
Living Expense	0.00	0.20	0.00	0.00	0.00
Job Opportunity	0.00	0.00	0.63	0.00	0.00
Close Industrial Experience	0.00	0.00	0.19	0.00	0.00
On-Campus Jobs	0.00	0.00	0.19	0.00	0.00
Climate	0.00	0.00	0.00	0.09	0.00
Commute	0.00	0.00	0.00	0.12	0.00
Safety	0.00	0.00	0.00	0.36	0.00
Convenience	0.00	0.00	0.00	0.10	0.00
Medical Facilities	0.00	0.00	0.00	0.23	0.00
Food Facilities	0.00	0.00	0.00	0.10	0.00
Recreational Activities	0.00	0.00	0.00	0.00	0.10
International Student Committees	0.00	0.00	0.00	0.00	0.20
Proximity to Relatives and Friends	0.00	0.00	0.00	0.00	0.13
Scholarship	0.00	0.00	0.00	0.00	0.07
Inconsistency	0.07	0.00	0.00	0.07	0.04

Level-2	Research	Courses	Facilities	Lab facilities	Length of course	Insurance	Tuition Fee	Living Expense	Job Opportunity	Close Industrial Experience	On-Campus Jobs	Climate	Commute	Safety	Convenience	Medical Facilities	Food Facilities	Recreational Activities	International Student Committees	Proximity to Relatives and Friends	Scholarship	
Massachusetts Institute of Technology	0.51	0.20	0.20	0.20	0.03	0.20	0.04	0.43	0.20	0.20	0.20	0.07	0.45	0.47	0.20	0.14	0.20	0.20	0.20	0.20	0.20	0.20
Stanford University	0.20	0.20	0.20	0.20	0.31	0.20	0.20	0.02	0.20	0.20	0.20	0.30	0.14	0.13	0.20	0.12	0.20	0.20	0.20	0.20	0.20	0.20
Carnegie Mellon University	0.11	0.20	0.20	0.20	0.09	0.20	0.26	0.21	0.20	0.20	0.20	0.14	0.13	0.13	0.20	0.45	0.20	0.20	0.20	0.20	0.20	0.20
University of California	0.09	0.20	0.20	0.20	0.09	0.20	0.23	0.22	0.20	0.20	0.20	0.34	0.14	0.14	0.20	0.14	0.20	0.20	0.20	0.20	0.20	0.20
Harvard University	0.00	0.20	0.20	0.20	0.10	0.20	0.28	0.12	0.20	0.20	0.20	0.16	0.14	0.13	0.20	0.14	0.20	0.20	0.20	0.20	0.20	0.20
Inconsistency	0.02	0.00	0.00	0.00	0.08	0.00	0.03	0.07	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00

The final result:

Level-1	Selecting universities for masters in computer science
Massachusetts Institute of Technology	0.23
Stanford University	0.20
Carnegie Mellon University	0.19
University of California	0.21
Harvard University	0.18
Inconsistency	0.02

Expert 6:

Level-1	selecting universities for masters in computer science					
College	0.20					
Finance	0.20					
Opportunity	0.20					
Topology	0.20					
Miscellaneous	0.20					
Inconsistency	0.00					

Level-2	College	Finance	Opportunity	Topology	Miscellaneous
Research	0.20	0.00	0.00	0.00	0.00
Course	0.20	0.00	0.00	0.00	0.00
Facilities	0.20	0.00	0.00	0.00	0.00
Lab facilities	0.20	0.00	0.00	0.00	0.00
Length of course	0.20	0.00	0.00	0.00	0.00
Insurance	0.00	0.33	0.00	0.00	0.00
Tuition Fee	0.00	0.33	0.00	0.00	0.00
Living Expense	0.00	0.33	0.00	0.00	0.00
Job Opportunity	0.00	0.00	0.69	0.00	0.00
Close Industrial Experience	0.00	0.00	0.15	0.00	0.00
On-Campus Jobs	0.00	0.00	0.16	0.00	0.00
Climate	0.00	0.00	0.00	0.08	0.00
Commute	0.00	0.00	0.00	0.20	0.00
Safety	0.00	0.00	0.00	0.25	0.00
Convenience	0.00	0.00	0.00	0.16	0.00
Medical Facilities	0.00	0.00	0.00	0.16	0.00
Food Facilities	0.00	0.00	0.00	0.13	0.00
Recreational Activities	0.00	0.00	0.00	0.00	0.08
International Student Committees	0.00	0.00	0.00	0.00	0.13
Proximity to Relatives and Friends	0.00	0.00	0.00	0.00	0.09
Scholarship	0.00	0.00	0.00	0.00	0.69
Inconsistency	0.00	0.00	0.00	0.03	0.02

Level-3	Research	Courses	Facilities	Lab facilities	Length of course	Insurance	Tuition Fee	Living Expense	Job Opportunity	Close Industrial Experience	On-Campus Jobs	Climate	Commute	Safety	Convenience	Medical Facilities	Food Facilities	Recreational Activities	International Student Committees	Proximity to Relatives and Friends	Scholarship
Massachusetts Institute of Technology	0.75	0.27	0.20	0.20	0.19	0.20	0.20	0.53	0.52	0.46	0.20	0.33	0.73	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Stanford University	0.12	0.41	0.20	0.20	0.33	0.20	0.20	0.23	0.20	0.27	0.20	0.30	0.09	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Carnegie Mellon University	0.06	0.14	0.20	0.20	0.20	0.20	0.27	0.10	0.17	0.13	0.20	0.13	0.07	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
University of California	0.04	0.10	0.20	0.20	0.14	0.20	0.19	0.08	0.06	0.08	0.20	0.15	0.05	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Harvard University	0.03	0.07	0.20	0.20	0.14	0.20	0.15	0.06	0.06	0.06	0.20	0.09	0.05	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Inconsistency	0.05	0.12	0.00	0.00	0.03	0.00	0.02	0.08	0.14	0.06	0.00	0.06	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

The final result:

Level-1	selecting universities for masters in computer science					
Massachusetts Institute of Technology	0.22					
Stanford University	0.21					
Carnegie Mellon University	0.18					
University of California	0.15					
Harvard University	0.14					
Inconsistency	0.02					

Expert 7:

Level-1	selecting universities for masters in computer science					
College	0.23					
Finance	0.23					
Opportunity	0.27					
Topology	0.08					
Miscellaneous	0.09					
Inconsistency	0.03					

Level-2	College	Finance	Opportunity	Topology	Miscellaneous
Research	0.30	0.00	0.00	0.00	0.00
Course	0.14	0.00	0.00	0.00	0.00
Facilities	0.11	0.00	0.00	0.00	0.00
Lab facilities	0.30	0.00	0.00	0.00	0.00
Length of course	0.30	0.00	0.00	0.00	0.00
Insurance	0.00	0.22	0.00	0.00	0.00
Tuition Fee	0.00	0.57	0.00	0.00	0.00
Living Expense	0.00	0.21	0.00	0.00	0.00
Job Opportunity	0.00	0.00	0.62	0.00	0.00
Close Industrial Experience	0.00	0.00	0.18	0.00	0.00
On-Campus Jobs	0.00	0.00	0.00	0.00	0.00
Climate	0.00	0.00	0.00	0.09	0.00
Commute	0.00	0.00	0.00	0.13	0.00
Safety	0.00	0.00	0.00	0.30	0.00
Convenience	0.00	0.00	0.00	0.11	0.00
Medical Facilities	0.00	0.00	0.00	0.27	0.00
Food Facilities	0.00	0.00	0.00	0.10	0.00
Recreational Activities	0.00	0.00	0.00	0.00	0.07
International Student Committees	0.00	0.00	0.00	0.00	0.12
Proximity to Relatives and Friends	0.00	0.00	0.00	0.00	0.08
Scholarship	0.00	0.00	0.00	0.00	0.75
Inconsistency	0.01	0.00	0.00	0.03	0.03

Level-3	Research	Courses	Facilities	Lab facilities	Length of course	Insurance	Tuition Fee	Living Expense	Job Opportunity	Close Industrial Experience	On-Campus Jobs	Climate	Commute	Safety	Convenience	Medical Facilities	Food Facilities	Recreational Activities	International Student Committees	Proximity to Relatives and Friends	Scholarship
Massachusetts Institute of Technology	0.50	0.20	0.20	0.20	0.14	0.18	0.04	0.24	0.20	0.20	0.08	0.56	0.52	0.20	0.11	0.20	0.20	0.20	0.20	0.20	0.20
Stanford University	0.20	0.20	0.20	0.20	0.27	0.14	0.10	0.04	0.20	0.20	0.20	0.37	0.10	0.12	0.20	0.12	0.20	0.20	0.20	0.20	0.20
Carnegie Mellon University	0.14	0.20	0.20	0.20	0.10	0.24	0.17	0.50	0.20	0.20	0.20	0.13	0.11	0.12	0.20	0.52	0.20	0.20	0.20	0.20	0.20
University of California	0.09	0.20	0.20	0.20	0.35	0.05	0.40	0.11	0.20	0.20	0.20	0.27	0.11	0.12	0.20	0.12	0.20	0.20	0.20	0.20	0.20
Harvard University	0.07	0.20	0.20	0.20	0.14	0.08	0.29	0.10	0.20	0.20	0.20	0.14	0.11	0.13	0.20	0.15	0.20	0.20	0.20	0.20	0.20
Inconsistency	0.03	0.00	0.00	0.00	0.06	0.18	0.04	0.13	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

The final result:

Level-1	selecting universities for masters in computer science					
Massachusetts Institute of Technology	0.22					
Stanford University	0.18					
Carnegie Mellon University	0.20					
University of California	0.21					
Harvard University	0.19					
Inconsistency	0.02					

Expert 8:

Level-1	Selecting universities for masters in computer science													
College	0.20													
Finance	0.20													
Opportunity	0.32													
Topology	0.12													
Miscellaneous	0.11													
Inconsistency	0.06													

Level-2	College	Finance	Opportunity	Topology	Miscellaneous
Research	0.34	0.00	0.00	0.00	0.00
Courses	0.13	0.00	0.00	0.00	0.00
Facilities	0.09	0.00	0.00	0.00	0.00
Lab facilities	0.08	0.00	0.00	0.00	0.00
Length of course	0.36	0.00	0.00	0.00	0.00
Insurance	0.00	0.19	0.00	0.00	0.00
Tuition Fee	0.00	0.60	0.00	0.00	0.00
Living Expense	0.00	0.21	0.00	0.00	0.00
Job Opportunity	0.00	0.00	0.67	0.00	0.00
Close Industrial Experience	0.00	0.00	0.16	0.00	0.00
On-Campus Jobs	0.00	0.00	0.16	0.00	0.00
Climate	0.00	0.00	0.00	0.05	0.00
Commute	0.00	0.00	0.00	0.12	0.00
Safety	0.00	0.00	0.00	0.35	0.00
Convenience	0.00	0.00	0.00	0.11	0.00
Medical Facilities	0.00	0.00	0.00	0.20	0.00
Food Facilities	0.00	0.00	0.00	0.14	0.00
Recreational Activities	0.00	0.00	0.00	0.00	0.07
International Student Committee	0.00	0.00	0.00	0.00	0.17
Proximity to Relatives and Friends	0.00	0.00	0.00	0.00	0.06
Scholarship	0.00	0.00	0.00	0.00	0.66
Inconsistency	0.05	0.00	0.00	0.03	0.03

Level-2	Research	Courses	Facilities	Lab facilities	Length of course	Insurance	Tuition Fee	Living Expense	Job Opportunity	Close Industrial Experience	On-Campus Jobs	Climate	Commute	Safety	Convenience	Medical Facilities	Food Facilities	Recreational Activities	International Student Committee	Proximity to Relatives and Friends	Scholarship
Massachusetts Institute of Technology	0.42	0.20	0.20	0.20	0.20	0.00	0.13	0.05	0.23	0.20	0.20	0.12	0.41	0.47	0.30	0.14	0.20	0.20	0.20	0.20	0.20
Stanford University	0.19	0.20	0.20	0.20	0.20	0.42	0.12	0.00	0.05	0.20	0.20	0.36	0.26	0.13	0.20	0.14	0.20	0.20	0.20	0.20	0.20
Carnegie Mellon University	0.13	0.20	0.20	0.20	0.20	0.11	0.13	0.10	0.49	0.20	0.20	0.20	0.18	0.17	0.13	0.20	0.45	0.20	0.20	0.20	0.20
University of California	0.11	0.20	0.20	0.20	0.20	0.33	0.04	0.01	0.07	0.20	0.20	0.27	0.10	0.13	0.20	0.13	0.20	0.20	0.20	0.20	0.20
Harvard University	0.09	0.20	0.20	0.20	0.20	0.11	0.58	0.25	0.16	0.20	0.20	0.05	0.07	0.13	0.20	0.13	0.20	0.20	0.20	0.20	0.20
Inconsistency	0.04	0.00	0.00	0.00	0.13	0.00	0.05	0.14	0.00	0.00	0.00	0.05	0.07	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00

The final result:

Level-1	Selecting universities for masters in computer science
Massachusetts Institute of Technology	0.20
Stanford University	0.19
Carnegie Mellon University	0.15
University of California	0.22
Harvard University	0.19
Inconsistency	0.03

Expert 9:

Level-1	Selecting universities for masters in computer science													
College	0.20													
Finance	0.20													
Opportunity	0.20													
Topology	0.20													
Miscellaneous	0.20													
Inconsistency	0.00													

Level-2	College	Finance	Opportunity	Topology	Miscellaneous
Research	0.20	0.00	0.00	0.00	0.00
Courses	0.20	0.00	0.00	0.00	0.00
Facilities	0.20	0.00	0.00	0.00	0.00
Lab facilities	0.20	0.00	0.00	0.00	0.00
Length of course	0.20	0.00	0.00	0.00	0.00
Insurance	0.00	0.33	0.00	0.00	0.00
Tuition Fee	0.00	0.33	0.00	0.00	0.00
Living Expense	0.00	0.33	0.00	0.00	0.00
Job Opportunity	0.00	0.00	0.67	0.00	0.00
Close Industrial Experience	0.00	0.00	0.07	0.00	0.00
On-Campus Jobs	0.00	0.00	0.07	0.00	0.00
Climate	0.00	0.00	0.00	0.10	0.00
Commute	0.00	0.00	0.00	0.24	0.00
Safety	0.00	0.00	0.00	0.27	0.00
Convenience	0.00	0.00	0.00	0.15	0.00
Medical Facilities	0.00	0.00	0.00	0.17	0.00
Food Facilities	0.00	0.00	0.00	0.06	0.00
Recreational Activities	0.00	0.00	0.00	0.00	0.02
International Student Committee	0.00	0.00	0.00	0.00	0.00
Proximity to Relatives and Friends	0.00	0.00	0.00	0.00	0.01
Scholarship	0.00	0.00	0.00	0.00	0.93
Inconsistency	0.00	0.00	0.00	0.10	0.01

Level-2	Research	Courses	Facilities	Lab facilities	Length of course	Insurance	Tuition Fee	Living Expense	Job Opportunity	Close Industrial Experience	On-Campus Jobs	Climate	Commute	Safety	Convenience	Medical Facilities	Food Facilities	Recreational Activities	International Student Committee	Proximity to Relatives and Friends	Scholarship
Massachusetts Institute of Technology	0.80	0.38	0.20	0.20	0.33	0.20	0.31	0.41	0.63	0.48	0.42	0.27	0.78	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Stanford University	0.08	0.32	0.20	0.20	0.24	0.20	0.31	0.23	0.12	0.22	0.25	0.34	0.08	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Carnegie Mellon University	0.05	0.13	0.20	0.20	0.18	0.20	0.15	0.18	0.12	0.14	0.18	0.15	0.06	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
University of California	0.03	0.10	0.20	0.20	0.17	0.20	0.13	0.10	0.09	0.11	0.09	0.16	0.04	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Harvard University	0.03	0.07	0.20	0.20	0.08	0.20	0.11	0.09	0.04	0.05	0.08	0.08	0.04	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Inconsistency	0.00	0.10	0.00	0.00	0.07	0.00	0.08	0.03	0.06	0.07	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

The final result:

Level-1	Selecting universities for masters in computer science
Massachusetts Institute of Technology	0.37
Stanford University	0.20
Carnegie Mellon University	0.16
University of California	0.15
Harvard University	0.19
Inconsistency	0.03

Expert 10:

Level-1	Selecting universities for masters in computer science									
College	0.19									
Finance	0.21									
Opportunity	0.46									
Topology	0.29									
Miscellaneous	0.06									
Inconsistency	0.11									

Level-2	College	Finance	Opportunity	Topology	Miscellaneous
Research	0.20	0.00	0.00	0.00	0.00
Courses	0.20	0.00	0.00	0.00	0.00
Facilities	0.20	0.00	0.00	0.00	0.00
Lab facilities	0.20	0.00	0.00	0.00	0.00
Length of course	0.20	0.00	0.00	0.00	0.00
Insurance	0.00	0.33	0.00	0.00	0.00
Tuition Fee	0.00	0.33	0.00	0.00	0.00
Living Expense	0.00	0.33	0.00	0.00	0.00
Job Opportunity	0.00	0.00	0.84	0.00	0.00
Close Industrial Experience	0.00	0.00	0.09	0.00	0.00
On-Campus jobs	0.00	0.00	0.07	0.00	0.00
Climate	0.00	0.00	0.00	0.05	0.00
Commute	0.00	0.00	0.00	0.13	0.00
Safety	0.00	0.00	0.00	0.43	0.00
Convenience	0.00	0.00	0.00	0.17	0.00
Medical Facilities	0.00	0.00	0.00	0.11	0.00
Food Facilities	0.00	0.00	0.00	0.12	0.00
Recreational Activities	0.00	0.00	0.00	0.00	0.01
International Student Committees	0.00	0.00	0.00	0.00	0.02
Proximity to Relatives and Friends	0.00	0.00	0.00	0.00	0.01
Scholarship	0.00	0.00	0.00	0.00	0.06
Inconsistency	0.00	0.00	0.00	0.10	0.01

Level-3	Research	Courses	Facilities	Lab facilities	Length of course	Insurance	Tuition Fee	Living Expense	Job Opportunity	Close Industrial Experience	On-Campus Jobs	Climate	Commute	Safety	Convenience	Medical Facilities	Food Facilities	Recreational Activities	International Student Committees	Proximity to Relatives and Friends	Scholarship	
Massachusetts Institute of Technology	0.43	0.32	0.30	0.31	0.23	0.20	0.28	0.20	0.76	0.20	0.20	0.31	0.35	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Stanford University	0.19	0.24	0.23	0.25	0.32	0.20	0.31	0.20	0.12	0.20	0.20	0.23	0.05	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Carnegie Mellon University	0.17	0.17	0.19	0.19	0.24	0.20	0.23	0.20	0.06	0.20	0.20	0.20	0.26	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
University of California	0.14	0.15	0.11	0.14	0.14	0.20	0.11	0.20	0.03	0.20	0.20	0.14	0.10	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Harvard University	0.05	0.12	0.08	0.10	0.07	0.20	0.08	0.20	0.03	0.20	0.20	0.12	0.24	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Inconsistency	0.12	0.02	0.06	0.04	0.11	0.00	0.08	0.00	0.09	0.00	0.00	0.02	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

The final result:

Level-1	Selecting universities for masters in computer science
Massachusetts Institute of Technology	0.45
Stanford University	0.18
Carnegie Mellon University	0.15
University of California	0.12
Harvard University	0.10
Inconsistency	0.03