CAREER GUIDANCE COUNSELLOR USING MACHINE LEARNING

Manasi Deshpande

30/06/2022

Abstract

A career counselor is responsible for helping students navigate any factors that impact their career development. Career guidance counsellor's role in everything from the screening to the interview process is especially important to share with students to ensure they have the best possibility of landing their dream careers.

Career counselling in the age of lifelong learning has difficulties in creating easily available services that connect services for education and work. The use of artificial intelligence to provide guidance in higher education and the workforce has received scant attention thus far. The use of artificial intelligence to help and advance career counselling in higher education institutions is discussed in this study.

The suggested method, which was created, is a web-based intelligent career advice system that helps students autonomously select a career whenever and wherever they are while using computers or portable/advanced mobile phones while they apply for admission to various fields of study. The intelligent system incorporates student-driven criteria for career advice, such as academic achievement, job interest, and personality analysis test results. Machine learning is currently a growing field with a role in the educational system, therefore this is another rising area of investigation. grammar check

Machine learning techniques may contribute by assisting students in choosing the best educational field to define their career. The model for the proposed system's education decision support system compromises its constituent parts, including the user interface

knowledge base and inference engine. Our approach leverages the expertise of a few domain experts by supporting machine learning type methodologies to provide a knowledge revelation design.

1.0 Introduction

For kids, selecting a job isn't always an easy undertaking, especially because the choice should be made based on a few factors and often at a young age. This important choice has an impact on the student's academic and professional future. A few educational and social problems, such as failure, dropout, a lack of skills, difficulty integrating into society, unemployment, etc., may have their roots in poor educational or professional advice. Career growth is a process that lasts a lifetime. Your interests, skills, values, personality, upbringing, and circumstances are just a few of the factors that might influence how your job develops.

The phrase "guidance" is occasionally overused to describe giving advice or supporting someone with any type of academic, professional, or personal problem.

The suggested solution would address the relevant difficulties using an online career advising system. The suggested system will evaluate pupils according to several criteria and suggest a career path. The criteria include things like personal preferences, character qualities, abilities, comfort levels, and so on. When the technology is used well, an online career counsellor can be more effective and forthcoming than a real counsellor.

An artificial intelligence system is a computer software that operates in a manner akin to how a biological brain does, with the exception that it uses an electrical path as opposed to activating neurons to carry out its tasks. describes the science and engineering of creating intelligent machines, especially intelligent computer programmes. An Expert System is a typical illustration of an artificial intelligence system (ES).

Any system with artificial intelligence is referred to as an intelligent system. Expert system approach is valuable to enable human expert (to career counsellors), additionally an authentic and effective device for the computerization\sand automation of the reasoning of human career instructor, by investigating the expert system highlights, for example, questioning ability, reasoning power, providing explanations, providing alternative solutions.

1.1 Initial Needs Statement

Using technology, like everything else, is unquestionably one of the best methods to stay up with the rate of this change. This is where SaaS (Software as a Service) models and machine learning-based career guidance platforms come into play, and they have a significant impact on ensuring that students are guided toward the appropriate career paths and that technology is used to its fullest extent possible to minimize human bias throughout the entire process.

While the student or individual in question must ultimately decide whether to pursue a certain professional route, AI and ML-based algorithms with their decision tree logic unquestionably help to reduce the options.

2.0 Customer Needs Assessment

The customers we are targeting for this app is the recent pass out if 12th grade that are looking to find an appropriate career for them according to their skills and people who are looking to restart their career by finding a profession that suits them.

An application for career counselling should provide appropriate advice based on the students' interests, intellect, and enthusiasm. There are several websites and applications available online that can suggest careers based on a person's personality qualities, but none of them include a person's preferences when choosing a student's job.

I created a small focus group and gathered data of customer needs assessment and they are as follows
1. User friendly
2. Privacy
3. Convenience
4. Efficiency
5. Compatibility
6. Options
7. Control
8. Design
9. Accessibility
10. Information

3.0 Target Specifications and Characterization

- The fundamental goal of career counselling is to assist professionals and students in selecting a profession that matches their talents and employment requirements.

- Aiding in the growth of a person's capacity for self-examination. investigation of potential career and educational paths

- Help you clarify your goals and understand your career options

- To determine your strength and weaknesses and device strategies to make the right choice professionally.

Above, mentioned targets can be achieved by analyzing:

- What are the students strengths
- What are the students weaknesses
- We can analyses grades of student to understand and analyse the results
- What are the hobbies of the student
- What kind of skills does the student possess
- Performing various activities to know what kind of skills does the student have

4.0 External Search

4.1 Benchmarking

Here we are evaluating various existing career counselling websites and apps available in the market based on six criteria's namely: User friendliness, cost effectiveness, design, results, experience and information.

Table 1. Benchmarking of Products

Feature	Mindler	CarreerGuide.com	Mapmytalent.in	iDreamcareer
User friendly	Yes	Yes	No	Low
Cost effective	Yes	Yes	No	Yes
Design	No	No	Yes	No
Results	Yes	Yes	Yes	No
Experience	Yes	Yes	No	No
Information	Yes	No	Yes	Yes

4.0 Applicable Standards
1. privacy laws for user data collection
2. ownership and protection rules and designing responsibly.
3. Assuring an audit of algorithms by the academic and open-source communities.
4. An examination of current work authorization laws.
5. Patents on machine learning techniques

4.1 Applicable Constraints

Scalability:
The technology must be scalable to adapt to the growth of the Internet application.

Need for expertise:
1. Requires a lot of research to obtain universal dataset for smart selection
2. Confidential data to be obtained to train the model.
3. Thorough understanding of dataset and verification of the results must be performed by the counsellor from the machine learning model to provide a better solution.

4.2 Business Opportunity

Career counsellor can guide you to get a perfect occupation that you have passion in but due to the human element there can be partiality due to human side of the business but if you exchange it with a machine learning model it can achieve perfection in its task. This model can help us guide more students towards good career options based on their skills and not just their report cards. It has very huge business opportunities as in India alone 1.5 crore students pass out of 12th grade. Also, people looking for career change can look at available opportunities so it has wide scope of customers.

5.0 Concept Generation

5.1 Problem Clarification

There are not a lot of websites or software's available out there that cater to all the counselling needs of students. A lot of websites have all the required feature but have huge amount of fees for assessment. We need a system that extracts important information from the student analyses it through machine learning model and gives appropriate results for free.

5.2 Concept Generation

After completing upper secondary school and reaching the point where they must select a suitable job path, the majority of students throughout the world are almost always confused. The students, who are just 18 years old, lack the maturity to understand precisely what one must do in order to select a rewarding professional path. Every student goes through a series of doubts or thinking processes about what to pursue beyond the 12th grade, which is the single tallest question, as we move through the phases. The next phase is determining whether they possess necessary abilities for the stream they have selected.

The steps in the proposed technique are as follows:

1. Data integration and transformation will be done using the students' answers to the questions. There will be four weighted replies for each question. The student's academic performance will also be given weight when determining their career.
2. Selection of Features: All features other than the student's name and ID will be chosen by the model. Each characteristic is significant in determining the student's career. The weights assigned to a feature will determine how important each characteristic is.
3. The Kmeans method will be used by the model to cluster each and every point. This algorithm will be improved to accurately forecast careers in the manner recommended by career experts. The result will include a list of clusters that are close to the field's centre as well as a list of all nearby fields.
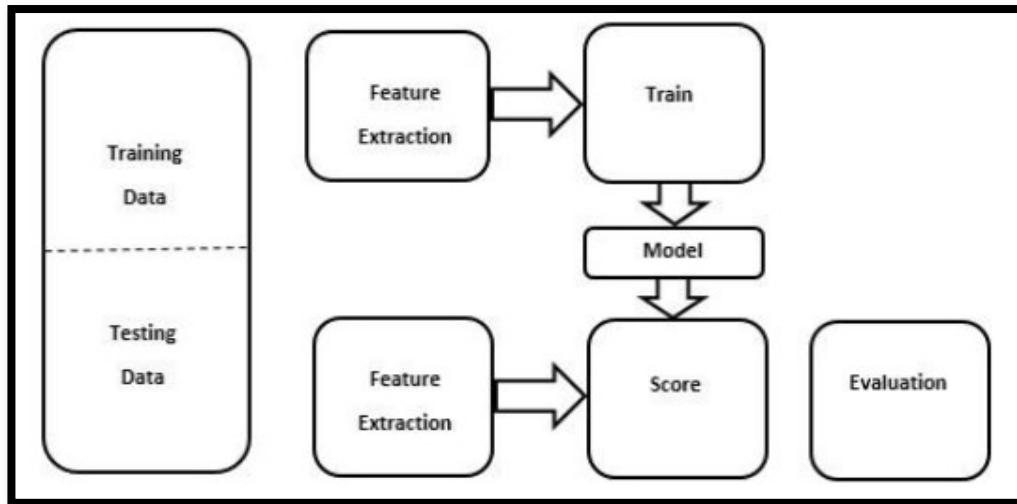
5.3 Algorithm

The Kmeans algorithm is an iterative computation that aims to divide the dataset into K predetermined distinct non-covering subgroups (bunches), each of which has space for a single information point. The groups are kept as different (far) as is reasonable given the circumstances, while an effort is made to make the between-group information foci as similar as is reasonable given the circumstances. It assigns information centres to a group so that the base of the squared distance between the information centres and the group's centroid (the number juggling mean of the substantial number of information centres that are assigned to that lot) is at the bottom. The information becomes more homogenous (comparable) the less variability we have within bunches.
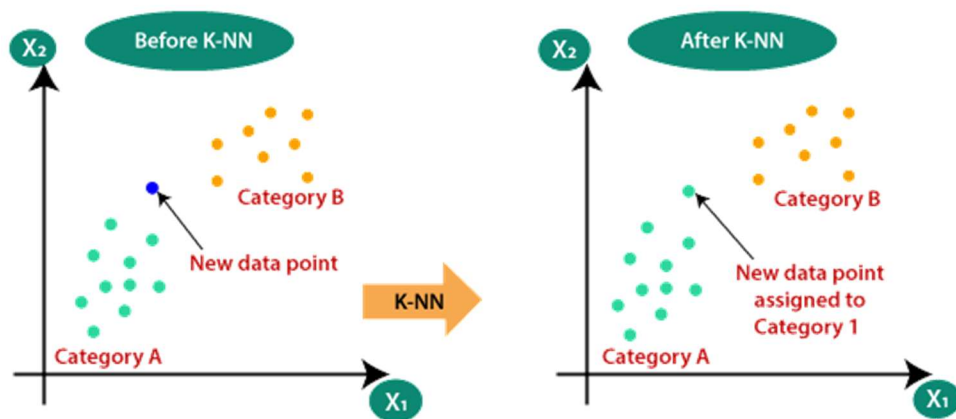
The KMeans Algorithm's use in career counselling:
1. Indicate K, the number of clusters (for number of fields)
2. Add centroids by rearranging the dataset first, and then arbitrarily
3. Keep focusing on the centroids until there is no change.
4. Completely process the squared distance between each centroid and its information focus.
5. Place each data point in the nearest cluster (centroid).
6. Sort the centroids for the bunches by averaging out

6.0 Final Design

7.0 How does it work?

We are developing an app that guides a student choose the right career path by first entering your grades received and telling various details about yourself and the machine learning algorithm makes decision and gives you various choices on what career option you have

It also gives you information about the career and all institutions that teach the particular skill. It also shows you jobs you can apply for in the field you scored most in. It is an all-in-one package if you want to find a right field to work in.
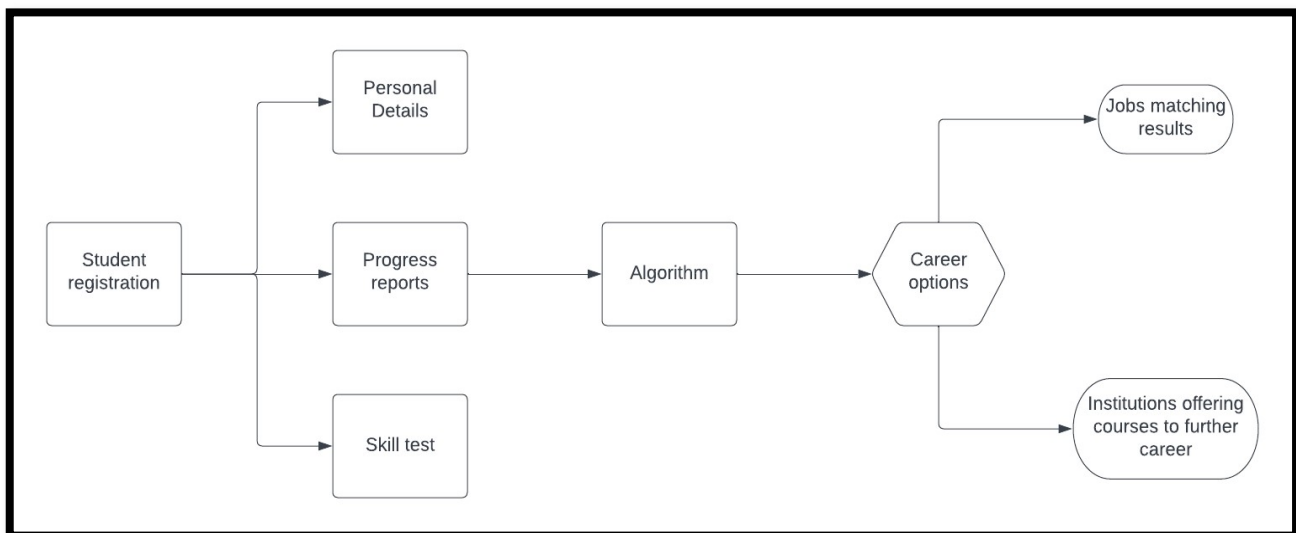
8.0 Conclusion

Every student may find a variety of vocations and streams in the app, and if they don't like the first stream, we also provide another one. Many students have some reservations about the stream they choose. Students can acquire thorough information on a particular stream through our app. Our machine trained Chatbot can answer these questions. In this project, we have examined the present situation, which shows that kids are having a tough time deciding on a job and ultimately, as a result of parental pressure, choose the incorrect field. This software aids the student in selecting the best job for their future in order to assist them overcome this predicament. By utilizing this programmed, it assists students in selecting the best career based on an interest test that using the kmeans algorithm. Additionally, it assists students in obtaining comprehensive information about the chosen stream using the chatbot function.

References

[1] Nita Andrea Mihaela, Lecturer, PhD, Ilie Goga Cristina, Assistant Prof., PhD, A research on the educational counselling and career guidance in Romania.

[2] R. Ravi, "Intelligent Chatbot for Easy Web-Analytics Insights," 2018 International Conference on Advances in Computing, Communications and Informatics (ICACCI), 2018

[3] Gati, I., Saka, N., & Krausz, M. (2001). Should I use a computer-assisted career guidance system? It depends on where your career decision-making difficulties lie. British Journal of Guidance & Counselling, 29(3), 301-321.

[4] Athanasou, J. A., & Van Esbroeck, R. (Eds.). (2008). International handbook of career guidance (Vol. 21). Springer Science & Business Media.