



## NEXTGEN CAREERS: NAVIGATING CAREERS WITH AI

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### ABSTRACT :

NextGEN Career AI is an advanced career guidance system designed to assist students in making informed decisions about their future. Leveraging artificial intelligence, the system analyzes a user's skills, interests, academic background, and career aspirations to provide personalized recommendations. It acts as a virtual career counselor, offering insights into various career paths, required skill sets, and potential job opportunities. The platform may integrate machine learning algorithms, natural language processing, and data analytics to enhance accuracy and user experience. By utilizing a vast database of educational and professional pathways, NextGEN Career AI aims to bridge the gap between students and their ideal careers, empowering them with the right information at the right time.

**Keywords**—Career Guidance, Artificial Intelligence, Machine Learning, Career Recommendation System, Student Counseling, Skill Assessment, Natural Language Processing, Job Opportunities, Personalized Career Advice.

### INTRODUCTION:

Career decision-making is a crucial aspect of a student's academic and professional journey, yet it remains one of the most challenging processes due to the vast number of career options, evolving industry requirements, and a lack of personalized guidance. Traditional career counselling methods rely on human intervention, which can be subjective, timeconsuming, and limited in scope. Many students, especially in developing regions, do not have access to quality career counselling services, leading to uninformed choices that may not align with their interests, skills, or the job market demand. To bridge this gap, NextGEN Career AI is developed as an intelligent career guidance system that leverages artificial intelligence, machine learning, and data analytics to provide personalized career recommendations. NextGEN Career AI functions as a virtual career counsellor by analysing a user's academic background, skills, interests, strengths, and aspirations to generate tailored career suggestions. The system processes vast amounts of career-related data, including industry trends, required qualifications, salary expectations, and future job market predictions, to provide comprehensive guidance. By integrating Natural Language Processing (NLP), the system allows users to interact seamlessly through a chatbot-like interface, making career exploration more engaging and interactive. Additionally, machine learning models continuously refine recommendations based on user feedback and evolving industry trends, ensuring accuracy and relevance. The increasing adoption of artificial intelligence in education and career planning has the potential to revolutionize how students and professionals make informed career choices. Unlike static career recommendation models, NextGEN Career AI dynamically adjusts its suggestions based on real-time industry demands, skill gaps, and future job opportunities. Furthermore, the system incorporates psychometric assessments and behavioural analysis to offer deeper insights into



an individual's personality traits, cognitive abilities, and work preferences. This ensures a holistic approach to career guidance, moving beyond academic achievements to include personal strengths and aspirations. The objective of this research is to explore the effectiveness of AI-driven career counselling, evaluate the impact of NextGEN Career AI on career decision-making, and analyse the role of technology in bridging the gap between education and employment. By utilizing AI-powered insights, students can make data-driven decisions, identify skill-building opportunities, and prepare for careers that align with their long-term goals. This paper aims to highlight the significance of AI in career guidance, present a detailed analysis of the system's framework, and discuss its potential to improve career outcomes for students and professionals worldwide.

### **PROBLEM DEFINITION :**

In today's rapidly evolving job market, students and professionals often struggle to make informed career decisions due to a lack of personalized guidance and access to real-time industry insights. Traditional career counseling methods are often generic, time-consuming, and unable to cater to an individual's unique skills, interests, and aspirations. Additionally, many students are unaware of emerging career opportunities, industry demands, and the necessary qualifications required to excel in their chosen fields. To address this challenge, **NextGEN Career AI** aims to develop an AI-powered career guidance system that provides personalized career recommendations based on user inputs, psychometric assessments, and real-time job market analysis. The system will use machine learning algorithms and natural language processing to analyze user preferences and suggest suitable career paths, educational programs, skill development opportunities, and potential job roles. By integrating an interactive chatbot and a structured career roadmap, the platform ensures that students receive tailored guidance, helping them bridge the gap between education and employment. This project seeks to revolutionize career counseling by offering an intelligent, data-driven, and user-friendly approach, enabling individuals to make well-informed career choices and improve their employability in a competitive job market.

### **LITERATURE REVIEW :**

The cultivation of STEM Major Intention among secondary school students is crucial for fostering future STEM talents. This study aims to investigate the factors that influence students' intention to pursue a STEM Major Intention, considering both school curriculum offerings and personal factors, employing Structural Equation Modeling analysis. A questionnaire survey was conducted with 425 middle school and high school students in a STEM demonstration area. The findings indicate that STEM Course Offerings, STEM Interests, and the availability of Career Planning Courses significantly impact their STEM Major Intention. Specifically, a greater abundance of STEM Courses leads to higher Interest in STEM among students, stronger STEM Interest translates to a higher STEM Major Intention, and Career Planning Courses can moderate the relationship between STEM Interests and STEM Major Intentions. The reasons for these results and recommendations for fostering STEM Major Intention will be explored further.[1] Career assistance programmes for student-athletes have seen increasing interest in Europe in the last decade, with beneficial impacts on athletes' sporting and academic careers, future employments, and personal lives. This research topic is rooted in the literature on dual career (DC) and career transitions and focuses on the fact that professional and semi-professional athletes face relevant stressors when transitioning from junior to senior competitive categories and from high school to university. Failures in these transitions often correspond in dropping out from sport or studies, but this can be prevented by adequate supporting services for studentathletes. The present paper outlines the protocol for a PhD research project aiming at enhancing or implementing academic career assistance services in South Tyrol. The project will be based on a mixed-method study design, consisting of: (Study 1) literature review, examination of national and international guidelines and of existing DC programmes, census of studentathletes



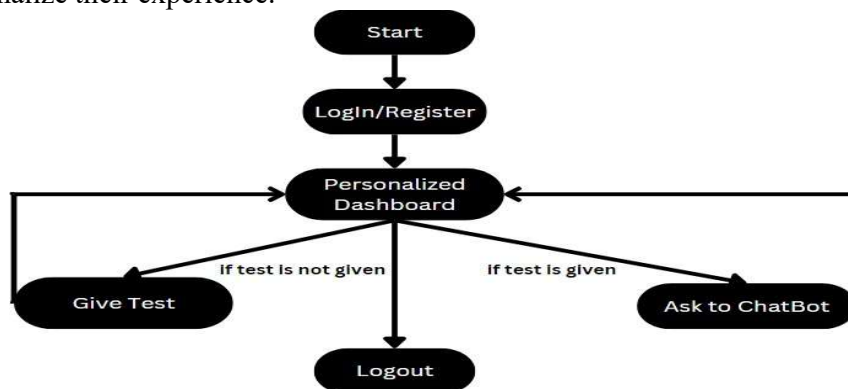
enrolled at the Free University of Bozen-Bolzano (UniBz); (Study 2) investigation through quantitative and qualitative methods to examine the links between student-athletes' identities, their well-being, and their academic and sporting performance; and (Study 3) evaluation of pros and cons of existing academic career assistance services at UniBz, that will be discussed within focus groups including student-athletes, coaches, scholars and other academic staff and stakeholders. Results from this project will inform the enhancement of existing services, with specific regard to student-athletes' careers.[2] With the highly demand of national development and labor market, more high-level talents are needed to engage in STEM careers. STEM career interest is an important predictor to students' STEM choices, it has attracted the attention of researchers. However, little is known about how STEM competitions affect students' career interests and their persistence in STEM. Therefore, the current study surveyed the views of 71 alumni who participated in STEM competitions at the high school, mixed methods was employed. The quantitative findings suggest that alumni acknowledge that competitions increase their interest in STEM careers. Although there is no significant difference in their choice of STEM majors compared to those who did not participate in the competition, the proportion of their continuing to participate in STEM activities and likelihood of pursuing STEM careers in the future is higher. Qualitative data show that students have access to more STEM resources through competitions, gained STEM knowledge, improved STEM skills, and had a positive feeling of STEM, which have promoted them to generate or maintain a STEM career interest, and on this basis, it is possible to choose STEM-related majors in universities, participate in STEM-related activities, and expect to engage in STEM careers in the future, forming a path of sustainable development in the STEM field. Our findings provide insight that STEM competitions are an important factor in increasing students' interest and persistence in STEM careers, and we suggest the development of STEM competitions can be further strengthened in the future.[3] The rise of computers and ICTs decades ago has gradually changed the life of all individuals across the world. With the Internet and technology in career counselling services and resources, both counsellors and clients are positively and negatively affected. With the growing interest in the personalization of services, career recommendations have seen an exponential growth with the technology savvy graduates and unemployed youth. This systematic review therefore focuses on the important role that personalised career recommendation systems play, as well as the various factors that can be used in developing personalized career recommendations in South Africa. This study will assist by providing effective career guidance and personalized recommendations to individuals in different contexts and settings. Google Scholar, IEEE Digital Library, Web of Science and ACM Digital Library were used to search for research publications for a period of ten years, from 2010 to 2020, which focused on personalized career recommendation systems. After the vetting process, a total of 25 articles were selected and presented in this systematic review. The findings of this study show the benefits of using personalised career recommendation systems outweigh the concerns and drawbacks that comes with artificial intelligence founded solutions.[4] A reliable career guidance system has become more crucial in this era of rapid technological advancements and ever-evolving industries. Career Prediction Application emerges as a trailblazer, reshaping our perception of professional journeys. This cutting-edge web-based platform, meticulously crafted using Django, leverages the wonders of machine learning to forecast potential career options for students and professionals alike accurately. The application puts the power of a personal career advisor right at fingertips, guiding you toward the most suitable paths in the vast landscape of opportunities. With its interactive and userfriendly interface, this system takes career planning to a whole new level, making it a musthave tool in today's fast-paced world. The platform boasts a plethora of powerful features, including a cutting-edge Resume Analyzer, an extensive Knowledge Network, and a curated collection of Courses, all aimed at empowering users to augment their skills and excel in their chosen careers. The centerpiece of this application lies in its Career Prediction module, which leverages the K-Nearest Neighbors (KNN) algorithm, a state-of-the-art machine learning technique, to scrutinize and evaluate user data

meticulously. The resume analyzer utilizes Natural Language Processing to analyze resumes, ensuring industry-standard content and formatting for increased visibility and job prospects. Overall proposed application leverages sophisticated algorithms and data analysis techniques to effectively match individuals' unique aptitudes, skills, and interests with the most suitable professions, enabling informed decisionmaking and fostering heightened career satisfaction.[5] The most frequent difficulty that graduates face is finding a suitable profession. Finding a job after graduation might be challenging for students who are unsure about their future goals. The goal of this project is to create a system that only recommends careers for students studying computer science. Web scraping was used to extract the career information from the JobStreet website. The recommendation is made using a content-based filtering technique that compares one thing to another based on the user's preferences. The user can easily make recommendations using the system's user-friendly interface and straightforward instructions. Using a specialised functionality tester, this system was put through its paces and more career opportunities will be offered to career vacancy websites in the future.[6] In 1900, less than 20 percent of the world population lived in cities, in 2007, just more than 50 percent of the world population lived in cities. In 2050, it has been predicted that more than 70 percent of the global population (about 6.4 billion people) will be city inhabitants. There is more pressure being placed on cities through this increase in population [1]. With advent of smart cities, information and communication technology is increasingly transforming the way city municipalities and city residents organize and operate in response to urban growth. In this paper, we create a generic scheme for navigating a route through out city. A requested route is provided by using combination of Dijkstra Algorithm and Haversine formula. Haversine Formula gives minimum distance between any two points on spherical body by using latitude and longitude. This minimum distance is then provided to Dijkstra algorithm to calculate minimum distance. The process for detecting the shortest path is mention in this paper.[7]

**PROPOSED METHODOLOGY:**

**Start:** The process begins when a user accesses the system. This entry point is universal for all users, whether new or returning.

**Log In/Register:** Upon starting, users are prompted to either log in to their existing account or register as new users. This step is crucial as it establishes the user's identity, allowing the system to personalize their experience.



**Personalized Dashboard:** Once the user is authenticated, they are directed to their personalized dashboard. This dashboard serves as a central hub, tailored to the user's preferences and previous interactions. It displays relevant information, options, and features accessible to the user, enhancing their engagement with the system.

**DECISION POINT — CHOOSING AN ACTION:**

**Take the Test:** If the user has not yet taken a specific test offered by the system, they are



presented with the option to do so. This test could be an assessment, evaluation, or survey designed to gather more information about the user or to provide them with valuable insights.

#### **THE PROCESS INVOLVES:**

**Undertaking the Test:** The user completes the test, which may consist of questions, tasks, or interactive activities.

**Processing Results:** Upon completion, the system processes the test results, which may influence the content or recommendations provided to the user thereafter.

**Return to Dashboard:** After the test, the user is redirected back to their personalized dashboard, now potentially updated with new information or features based on their test outcomes.

**Interact with Chatbot:** Users who have already taken the test or those seeking assistance have the option to engage with a chatbot. The chatbot serves multiple functions:

**Providing Support:** It answers user queries, offers guidance, and assists with troubleshooting issues.

**Enhancing Engagement:** Through conversational interactions, it enhances the user experience by providing instant responses.

**Learning from Users:** The chatbot may also collect feedback to improve the system.

**Return to Dashboard:** After the interaction, users are taken back to the dashboard to continue exploring other features.

**Logout:** At any stage, users have the option to log out:

**Terminating the Session:** Logging out ends the user's session, ensuring that their personal information and activity remain secure.

**Security Measure:** This step is vital for maintaining data privacy, especially on shared or public devices.

**End:** The user's session concludes either after they log out or exit the system. The flowchart emphasizes that users can cycle through the testing and chatbot interactions multiple times before ending their session, providing flexibility and control over their experience.

#### **ADVANTAGES:**

1. Personalized Career Guidance – The system tailors career recommendations based on individual skills, interests, academic background, and psychometric assessments, ensuring customized career paths.
2. AI-Powered Decision Making – By leveraging artificial intelligence and machine learning, the platform provides data-driven career suggestions, reducing human biases and errors in traditional counseling.
3. Real-Time Job Market Insights – The system continuously analyzes industry trends, job opportunities, and skill demands, helping users stay updated on emerging career fields.
4. Interactive Chatbot Assistance – The NLP-powered chatbot allows users to interact in real time, ask career-related questions, and receive instant recommendations, making the process more engaging and accessible.
5. Skill Development Roadmap – The platform not only suggests career options but also provides a step-by-step guide on necessary skills, certifications, courses, and internships required for career advancement.
6. Time and Cost Efficiency – Unlike traditional career counseling, which requires scheduling appointments and fees, NextGEN Career AI offers an instant, scalable, and cost-effective solution accessible to a large audience.
7. Data-Driven Career Assessment – The platform integrates psychometric and aptitude assessments to provide deeper insights into an individual's cognitive abilities, work preferences, and potential career matches.





8. Adaptability and Continuous Learning – The system refines its recommendations based on user feedback and evolving job market trends, ensuring relevance and accuracy over time.
9. Bridging the Education-Employment Gap – By providing structured career roadmaps and skill development suggestions, the system helps users transition seamlessly from education to professional careers.
10. Accessibility Across Platforms – The system can be deployed as a web and mobile application, making it widely accessible to students and professionals worldwide.

### CONCLUSION :

In conclusion, the NextGEN Career project offers a comprehensive and efficient solution for guiding students toward suitable educational and career paths. By leveraging advanced data processing and communication techniques, the system provides personalized recommendations based on a user's interests, strengths, and academic background. Through operations like node and group identification, career boundary computation, and career fit checks, the platform ensures that each student receives tailored advice that aligns with their aspirations. The use of technologies like PVM, MPI, and Dame- PVM enhances the system's performance, ensuring that data processing and communication happen swiftly and efficiently. Despite the complexity of operations, the system achieves minimal response times for most functions, ensuring a seamless user experience. The ability to exchange data with external sources further enriches the platform, allowing it to stay updated with real-time career information. Ultimately, the NextGEN Career project stands as an innovative solution to the challenges students face when navigating the vast landscape of career options. By combining AI-driven recommendations with a robust and scalable system architecture, it has the potential to serve as a valuable tool in helping students make informed decisions about their future. The project's success lies in its ability to adapt to individual needs, offering a personalized and efficient career counseling experience.

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