***AI-Based Career Path Recommendation System Using Machine Learning***

Submitted by: Vandana Kurapati

College: SRK Institute of Technology

Internship: SmartInternz - Artificial Intelligence and Machine Learning

***Title***:

***AI-Based Career Path Recommendation System Using Machine Learning***

***Abstract:***

In today’s rapidly evolving world, students face a complex set of choices when deciding their future careers. This project presents a machine learning-based career recommendation system that suggests the most appropriate career path based on a student’s academic performance, interests, and skills. The system is designed to reduce career decision uncertainty and help students understand their strengths. Using classification algorithms and a labeled dataset, the model offers personalized career suggestions...

***🌟 Why This Project?***

Today, with thousands of courses and career paths, students are often confused about what to pursue. This project uses AI/ML to recommend the best career path for students based on their interests, skills, and academic performance.

***🧠 Problem Statement:***

Students often make career decisions without a clear understanding of what suits them best. This project aims to help students by building a smart system that can guide them using AI.

***🔧 Tools & Technologies:***

Programming Language: Python

Libraries: Pandas, NumPy, Scikit-learn, Matplotlib, Seaborn

Algorithm: Decision Tree / Random Forest / KNN

Deployment: Streamlit / Flask (optional)

Dataset: Synthetic dataset or real datasets from Kaggle/UCI

***📊 Dataset (You can create or find one like this):***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Name | Math | English | Programming | Creativity | Interest in science | Interest in Art | Suggest Career |
| Naga | 90 | 70 | 78 | 59 | 1 | 0 | Data Scientist |
| Swami | 80 | 80 | 90 | 78 | 0 | 0 | Software Engineer |
| Vandana | 75 | 78 | 78 | 98 | 0 | 1 | Graphic designer |
| Vandi | 68 | 79 | 79 | 78 | 1 | 1 | Data science |
| Sai | 79 | 89 | 67 | 89 | 1 | 0 | Graphic designer |

***✅ Project Workflow:***

1. Data Collection:

Prepare a dataset with student profiles and career labels.

1. Data Preprocessing
2. Handle missing values.
3. Normalize/scale features.

Encode categorical data if present.

2.Model Building:

Split the dataset into train/test.

Train a model (e.g., Decision Tree Classifier).

Evaluate the model with accuracy, confusion matrix, etc.

3.Prediction:

Use the model to predict a student’s career path

4. Deployment (Optional):

Create a web form using Streamlit to enter student details and get predictions.

***🧪 Sample Python Code:***

Import pandas as pd

From sklearn.model\_selection import train\_test\_split

From sklearn.tree import DecisionTreeClassifier

From sklearn.metrics import accuracy\_score, classification\_report

# Load dataset

Data = pd.read\_csv(‘career\_data.csv’)

# Features and labels

X = data.drop(‘Suggested Career’, axis=1)

Y = data[‘Suggested Career’]

# Train-test split

X\_train, X\_test, y\_train, y\_test = train\_test\_split(X, y, test\_size=0.2, random\_state=42)

# Model training

Model = DecisionTreeClassifier()

Model.fit(X\_train, y\_train)

# Prediction

Y\_pred = model.predict(X\_test)

# Evaluation

Print(“Accuracy:”, accuracy\_score(y\_test, y\_pred))

Print(“Report:\n”, classification\_report(y\_test, y\_pred))

***📈 Output:***

Console will show model accuracy.

You can use model.predict() to input new data and get career suggestions.

***📋 Conclusion:***

This AI-based career path recommendation system is a smart approach to guide students toward their future. It combines machine learning classification techniques with real-world student data to make intelligent predictions. With further improvements like deep learning or user feedback integration, it can become a highly impactful application.

***📎 Future Enhancements:***

Add resume and interest-based recommendation.

Integrate NLP to read descriptive answers.

Deploy on the cloud (Heroku, Render, etc.).

***References:***

[www.kaggle.com](http://www.kaggle.com)

Scikit-learn Documentation

Research papers on ML in education

Streamlit.io Docs