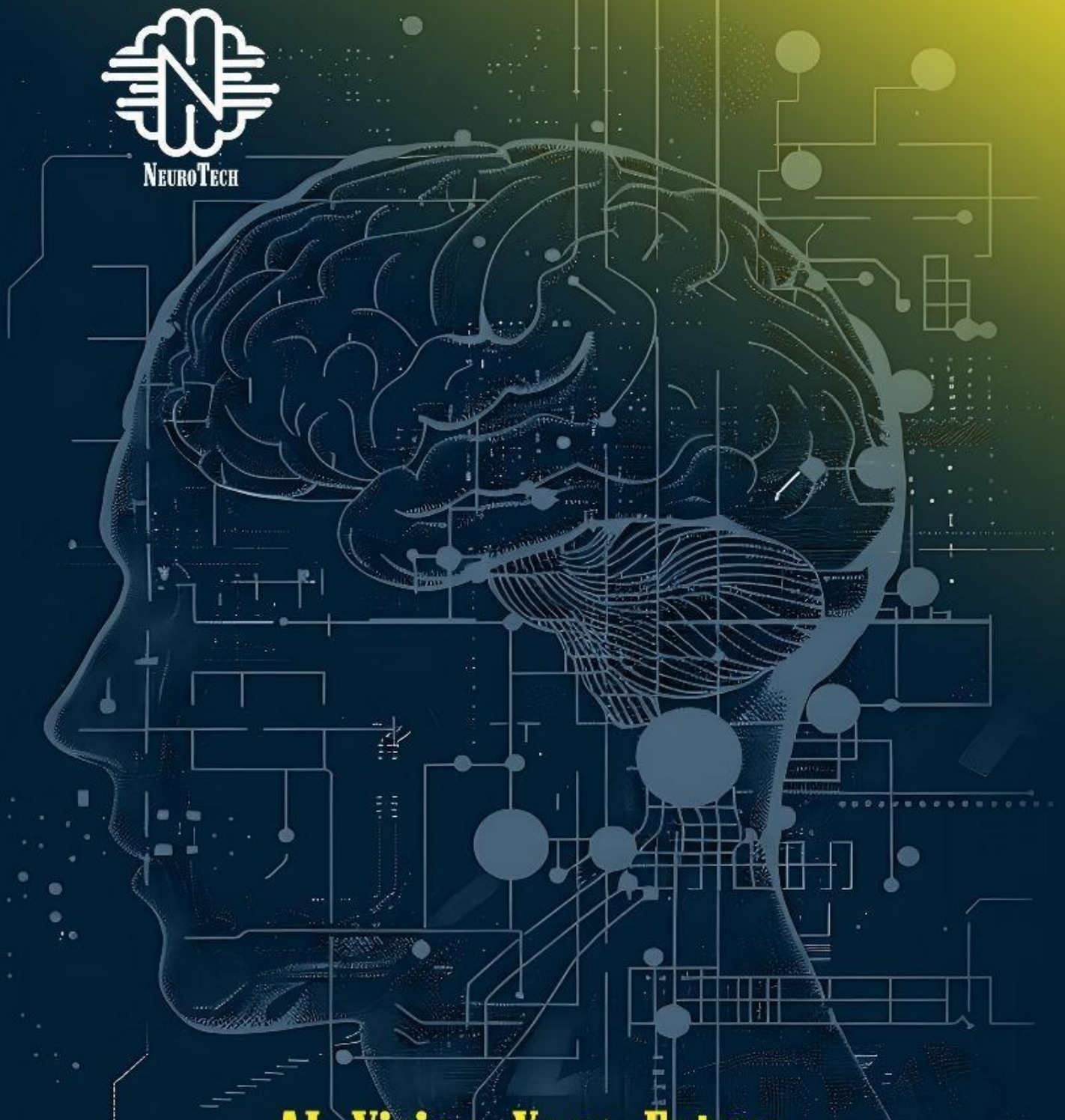

AI Vision Your Future

Technical and Training Services

NeuroTech

+201556811997 +201114782443 +201020514319

@neurotecheg info@neurotecheg.com www.neurotech.com

Data Science Diploma

Advanced Level

Diploma Courses:

1. Python Course (20 hour)
2. Math & Data Preparation Course (20 hour)
3. Machine Learning Course (60 hour)
4. Projects

- **Prerequisites:**
  - Data Analysis Diploma
  - Or (Data Science Intermediate Level)

NEUROTECH

Course 1 “Python” :(20 hour)

Module 1: File Input/Output

- Reading and writing files
- CSV, JSON, and other data formats
- Exception handling
- Debugging techniques
- Logging and profiling

Module 2: Object-Oriented Programming

- Classes and objects
- Inheritance and polymorphism
- Encapsulation and abstraction
- Class methods and static methods
- Special methods and operator overloading

Module 3: Web Scraping

- Introduction
    - Definition of web scraping
    - Why web scraping is important.
    - Legal and ethical considerations
- HTML Basics
    - Structure of HTML documents
    - HTML tags and attributes
    - Using the browser inspector to inspect HTML code.
- Web Scraping with Python
    - Introduction to BeautifulSoup library
    - Retrieving data from websites using requests library
    - Parsing HTML code with BeautifulSoup
    - Finding and extracting data from HTML elements

Course 2 “Math and Data Preparation”: (20 hour)

Module 1

1. Linear Algebra
   - Vectors and Matrices
   - Matrix Operations (Addition, Scalar Multiplication, Transpose, Matrix Multiplication, Inverse)
   - Eigenvalues and Eigenvectors
   - Singular Value Decomposition
   - Matrix Factorization (QR, LU, Cholesky)
2. Calculus
   - Limits and Continuity
   - Derivatives (Chain Rule, Product Rule, Quotient Rule)
   - Optimization with Derivatives (Maxima and Minima)
3. Probability Theory
   - Probability Spaces and Random Variables
   - Probability Distributions (Bernoulli, Binomial, Poisson, Normal, Exponential)
   - Joint and Conditional Probability
   - Central Limit Theorem

Module 2

1. Descriptive Statistics
   - Measures of Central Tendency (Mean, Median, Mode)
   - Measures of Dispersion (Variance, Standard Deviation, Range)
   - Histograms and Box Plots
   - Probability Density Functions
2. Inferential Statistics
   - Hypothesis Testing (Null and Alternative Hypotheses, p-values, Type I and Type II errors)
   - Confidence Intervals

Module 3:

- Data Preprocessing and Exploratory Data Analysis
  - Third party libraries (NumPy, Pandas, Matplotlib, Seaborn)
  - Data collection and cleaning
  - Data preprocessing techniques (e.g., normalization, scaling)
  - Exploratory data analysis (EDA)
  - Data visualization

Course 3 “Machine Learning”: (60 hour)

Module 1:

- Introduction to Machine Learning
  - Definition of machine learning
  - Different types of machine learning
  - Applications of machine learning
  - Overview of the machine learning process

Module 2:

- Supervised learning
  - Regression
    - Linear regression
    - Polynomial regression
    - KNN
    - Decision tree
    - Random forest
  - Classification
  - Logistic Regression
    - KNN
    - Naïve bay’s
    - Decision tree
    - Random forest
    - adaBoost
    - XGBoost
    - SVM
- Dimensionality Reduction
  - Feature selection
  - Feature extraction

Module 3:

- Unsupervised learning
  - Clustering
    - k-means
    - agglomerative, divisive
    - BDSCAN
  - Recommendation systems
    - Apriori

Module 4:

- Model Evaluation
  - Training, validation, and testing sets
  - Performance metrics (e.g., accuracy, precision, recall)
  - Cross-validation
  - Hyperparameter tuning.

NeuroTech

Projects

- Real Estate Listings Scraper
- Customer Segmentation and Analysis
- Healthcare Data AnalysisMarket Basket Analysis
- Customer Churn Analysis
- Healthcare Diagnostics
- House Pricing
- Customer Churn
- Predictive Maintenance
- Energy Consumption Forecasting
- Recommendation Systems for E-commerce.
- Real Estate Prediction