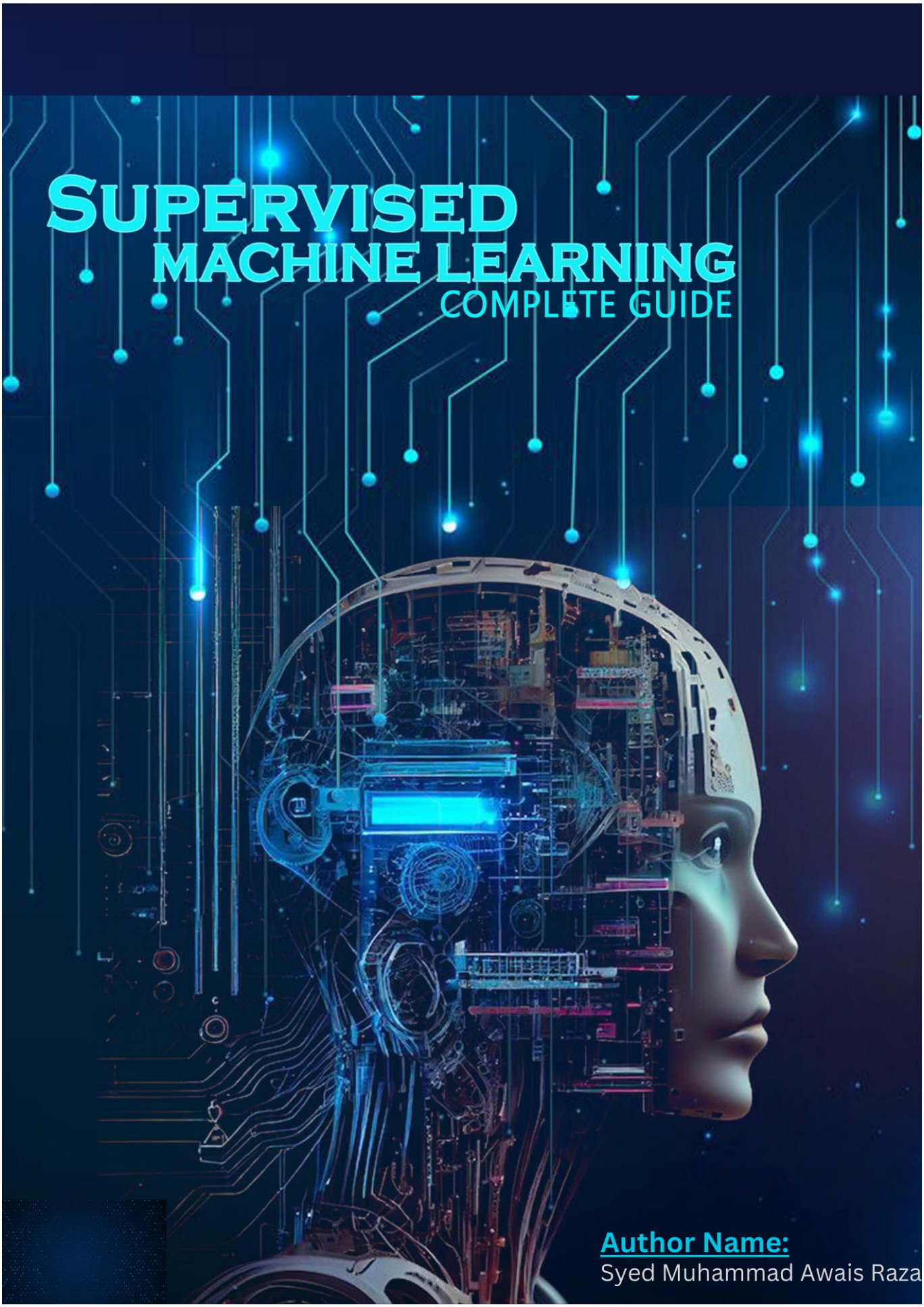
SUPERVISED
MACHINE LEARNING
COMPLETE GUIDE
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ABOUT THE AUTHOR

ACADEMIC BACKGROUND

I, Syed Muhammad Awais Raza a passionate Bachelor's inArtificial Intelligence student at COMSATS University Islamabad, deeply interested in Data Science and Machine Learning. I specialize in data analysis, visualization, and Python programming, with proficiency in key libraries such as Pandas, NumPy, Seaborn, Plotly, and Scikit-learn. My expertise also extends to TensorFlow and PyTorch, enabling me to build advanced machine learning models.

COMMUNITY AND LEADERSHIP

Throughout my academic journey, I have been committed to both learning and sharing knowledge. As the founder of Hexagon AI/ML Society, I lead a community of over 200 members, where I mentor students on topics ranging from Python basics to advanced machine learning. I enjoy writing blog posts, using Markdown to present complex data science concepts with clarity and interactivity.

CERTIFICATIONS AND SKILLS

I have earned certifications from Microsoft, LinkedIn Learning, and Python Career Trainers, continuously expanding my skills in Machine Learning, Data Science, and Generative AI. With an analytical mindset and a strong foundation in AI, I am driven by the desire to explore and contribute to the ever-evolving world of Artificial Intelligence.

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ABOUT THE GUIDE

This guide is designed for learners who want to deepen their understanding of Supervised Machine Learning. It offers a comprehensive journey, starting from the basics of machine learning, diving into various supervised learning models, and expanding into advanced techniques like Ensemble Learning, Hyperparameter Tuning, and Cross-Validation. Along the way, readers will gain insights into key evaluation metrics, the importance of data preprocessing, and practical implementation strategies.

The content is structured to cater to both beginners and intermediate learners, gradually building complexity. Each section is supplemented with examples, visualizations, and Python code to reinforce learning.

PREREQUISITES

To get the most out of this guide, it is recommended that readers have:

- A basic understanding of Python programming
- Familiarity with Python libraries such as Pandas, NumPy, Matplotlib, and Scikit-learn
- Knowledge of fundamental concepts in Linear Algebra and Statistics
- Exposure to basic data analysis and visualization techniques

For those new to these topics, introductory resources are provided in early sections to ensure a smooth learning curve.

GUIDE OBJECTIVE

By the end of this guide, readers will:

- Understand the principles of Supervised Machine Learning
- Be able to implement various models like Linear Regression, Support Vector Machines, Decision Trees, and more
- Gain hands-on experience with model evaluation, hyperparameter tuning, and cross-validation techniques
- Learn how to build pipelines to streamline their machine learning workflow

This guide is aimed at preparing readers to apply these concepts to real-world data problems, advancing their proficiency in Machine Learning and Data Science.

Table of Contents

    - Stacking
    - Blending
14. **Bagging**
    - Random Forest
        - Random Forest Regressor
        - Random foresst Classifier
15. **Boosting**
    - Boosting Algorithms
    - Adaboost
        - Adaboost Regressor
        - Adaboost Classifier
    - XGBoost
        - XGBoost Regressor
        - XGBoost Classifier
    - CatBoost
        - Catboost Regressor
        - Catboost Classifier
16. **Hyperparameter Tuning and Cross Validation**
    - Techniques for Hyperparameter Tuning
        - Grid Search
        - Random Search
        - Bayesian Optimization
    - Cross Validation
        - K-Fold Cross-Validation
        - Leave-One-Out Cross-Validation (LOOCV)
        - Stratified K-Fold Cross-Validation
        - Time Series Cross-Validation
        - Group K-Fold Cross-Validation
17. **Pipeline**
    - Components
    - Creating and executing pipeline in python
    - Advantages of using Pipeline
18. **Probability**
    - Introduction
    - Rules of probability
    - Bayes' Theorem
    - Application of probability
19. **Naive Bayes Algorithm**
    - Types of Naive bayes
20. **Conclusion**