My personalized Artificial Intelligence (AI) Msc Program in Computer Engineering and Automation, AI.

Introduction

I am **Leon Doungala**, and I extend a warm welcome to my personalized Artificial Intelligence (AI) Master's Program in Computer Engineering and Automation. This meticulously crafted roadmap is designed to lead me through a transformative journey within the vast realm of AI.

Objectives

Join me on this exciting journey as we aim to:

- Establish Foundations:
- Develop a strong understanding of Python and Mathematics.
- Dive into Data Insights:
- Explore Exploratory Data Analysis (EDA) techniques for comprehensive data understanding.
- Master Machine Learning:
- Acquire essential skills in **Machine Learning (ML)** using scikit-learn.
- Advance in ML and AWS:
- Explore advanced ML techniques and harness the power of **AWS** for Machine Learning.
- Unlock Deep Learning:
- Cover the intricacies of **Deep Learning**, including neural networks and convolutional neural networks.
- See with Computer Vision:
- Grasp the fundamentals of **Computer Vision** and automation techniques.
- Command Language with NLP:
- Delve into Natural Language Processing (NLP) and understand the nuances of Reinforcement Learning.
- Get Hands-On:
- Engage in practical projects, contribute to open-source, and deploy models.

- Optimize and Tune:
- Develop expertise in model optimization, hyperparameter tuning, and ethical considerations in AI.
- Navigate Big Data:
- Understand the role of **Big Data** in AI and its integration into projects.
- Spark Creativity in Generative AI:
- Explore **Generative AI**, delve into **Intelligent Robotics**, and stay updated on AI trends.

Program Structure

- Week 1-2: Foundations in Python, Mathematics, and EDA
 - Week 1: Python and Mathematical Concepts
 - Content: Immerse in Python fundamentals and mathematical concepts.
 - Exercises: Engage in practical Python projects.
 - **Skills:** Develop proficiency in **Python** programming and basic mathematics.
 - Resources: Leverage Coursera Python for Everybody, Khan Academy Math, NumPy Quickstart Tutorial, and pandas documentation.
 - Week 2: Unveiling Data Secrets with EDA
 - Content: Master Exploratory Data Analysis techniques.
 - Exercises: Apply EDA techniques to real-world data.
 - Skills: Hone skills in EDA techniques and data understanding.
 - Resources: Immerse in online courses focusing on EDA.

• Week 3-4: Advanced ML and AWS

• Week 3: Mastering Advanced ML with scikit-learn

- Content: Dive into advanced ML algorithms with scikit-learn.
- Exercises: Solve problems using advanced ML techniques.
- Skills: Master advanced ML techniques.
- Resources: Access Coursera Machine Learning Specialization, Stanford Online Machine Learning, Fast.ai, Tutoriels PyTorch, PapersWithCode, and arXiv.

• Week 4: AWS Magic in Machine Learning

• Content: Leverage AWS for Machine Learning.

• Exercises: Gain hands-on experience with AWS.

• Skills: Master AWS for ML.

• Resources: Explore AWS documentation.

• Week 5-6: Deep Learning Basics

• Week 5: Embracing Git and Intro to Deep Learning

- Content: Command version control with Git and grasp the basics of Deep Learning.
- Exercises: Navigate Git and embark on introductory Deep Learning projects.
- Skills: Develop prowess in Git, TensorFlow, and PyTorch.
- Resources: Enroll in Git and GitHub courses, explore TensorFlow documentation, and dive into PyTorch documentation.

• Week 6: Fundamentals of Deep Learning

- Content: Uncover the fundamentals of Deep Learning and neural networks.
- Exercises: Build and train neural networks.
- Skills: Establish a strong foundation in Deep Learning basics
- Resources: Engage with online courses and tutorials.

• Week 7-8: Deep Learning Advanced and Computer Vision

• Week 7: Mastering Advanced Deep Learning Techniques

- Content: Explore advanced techniques in Deep Learning.
- Exercises: Undertake advanced Deep Learning projects.
- Skills: Command advanced Deep Learning.
- Resources: Immerse in specialized courses and research articles.

• Week 8: Computer Vision Basics and OpenCV

- Content: Grasp the fundamentals of Computer Vision and OpenCV.
- Exercises: Implement basic Computer Vision tasks.
- Skills: Navigate Computer Vision basics and OpenCV.
- Resources: Explore online courses, documentation, and tutorials.

• Week 9: Advanced Generative AI

- Week 9: Unleashing Creativity with Advanced Generative AI and GANs
 - Content: Delve deep into Generative Adversarial Networks (GANs).
 - Exercises: Implement GANs and sequence models.
 - Skills: Master GANs and sequence models.
 - Resources: Explore specialized courses and research articles.
- Weeks 10-11: Big Data and AI
 - Week 10: Introduction to Big Data in AI
 - Content: Grasp the basics of Big Data in the context of AI.
 - Exercises: Integrate Big Data solutions.
 - Skills: Master Apache Spark and Hadoop.
 - Resources: Refer to Apache Spark documentation and Hadoop tutorials.
 - Week 11: Advanced Big Data Applications in AI
 - Content: Explore advanced applications of Big Data in AI projects.
 - Exercises: Gain hands-on experience with advanced Big Data tools.
 - Skills: Navigate advanced Big Data applications.
 - Resources: Explore relevant documentation and tutorials.

- Weeks 12-13: Model Evaluation, AI Ethics, History, and Applications
 - Week 12: Mastering Model Evaluation and Hyperparameter Tuning
 - Content: Dive into techniques for model evaluation and hyperparameter tuning.
 - Exercises: Optimize previously created models.
 - Skills: Command model evaluation and hyperparameter tuning.
 - Resources: Read articles and documentation on model optimization.
 - Week 13: Delving into AI Ethics, History, and Current Applications
 - Content: Reflect on ethical considerations in AI, historical overview, and current applications.
 - Exercises: Engage in discussions and case studies.
 - Skills: Develop skills in ethical decision-making and historical understanding.
 - Resources: Attend lectures and read articles on AI ethics, engage in historical research.
- Weeks 14-15: Embarking on Advanced Projects, Exploring AI Trends, and Program Conclusion
 - Week 14: Tackling Advanced AI Projects
 - Content: Work on advanced AI projects.
 - Exercises: Implementing complex projects.
 - Skills: Command implementation and project management.
 - Resources: Explore research articles, attend online

conferences, and follow specialized blogs.

• Week 15: Exploring Emerging AI Trends and Program Conclusion

• Content: Explore emerging AI trends.

• Exercises: Stay updated on AI trends.

• **Skills:** Stay abreast of AI trends.

• Resources: Dive into research articles, attend online conferences, and follow specialized blogs.