AUGMENTED A.I.
Fusing AI Innovation & Next-Gen Education

About Augmented AI

Augmented A.I., initially *Augmented Startups*, founded by Ritesh Kanjee, offers AI and computer vision education through courses, projects, and YouTube tutorials to over 113K subscribers. Its mission is to simplify AI learning, bridging the gap between academia and industry skills for career advancement. The company focuses on drones, AI, ChatGPT, and generative AI, aiming to keep learners ahead in technology.
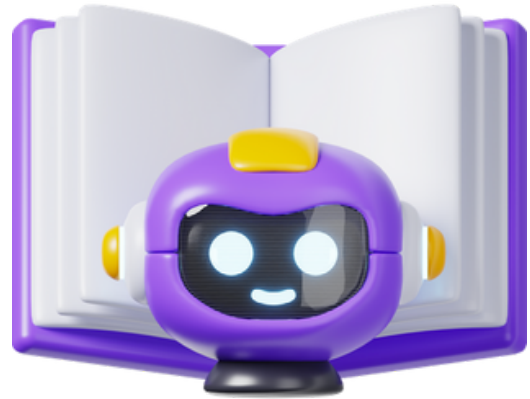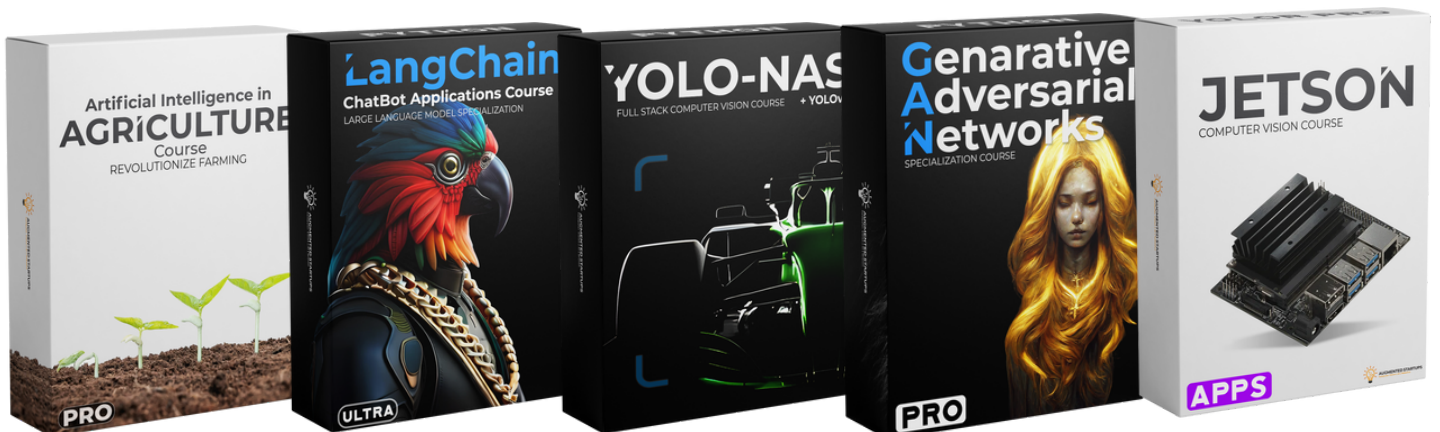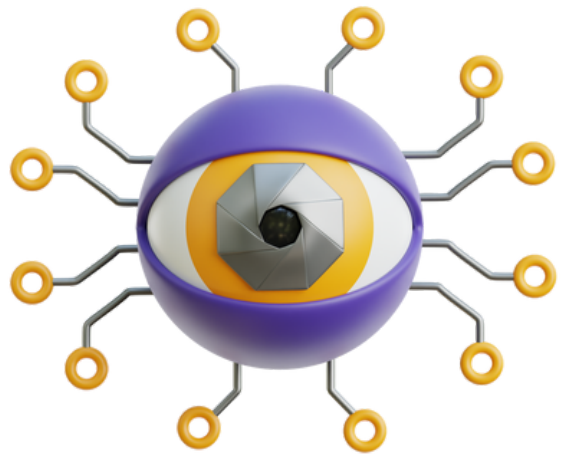
Our Mission

To simplify and democratize AI and computer vision education, making cutting-edge technology accessible to everyone. We aim to bridge the gap between academic learning and practical workplace skills, empowering learners to advance their careers in technology

Our Vision

To lead in AI and computer vision education by fostering innovation, making a global impact through accessible learning, and empowering individuals and organizations to leverage AI for positive change. We strive to build a community of learners and innovators ready to tackle future challenges in technology.

Artificial Intelligence in **AGRICULTURE** Course REVOLUTIONIZE FARMING — PRO

LangChain ChatBot Applications Course LARGE LANGUAGE MODEL SPECIALIZATION — ULTRA

YOLO-NAS FULL STACK COMPUTER VISION COURSE + YOLOv8 — PRO

Generative Adversarial Networks SPECIALIZATION COURSE — PRO

JETSON COMPUTER VISION COURSE — APPS

Augmented A.I. University

Inclusions:

### One-on-one Personal Coaching

Exclusive to the Elite Plan: Get 2 private coaching sessions or mentorship with **Ritesh Kanjee**, a leading expert in computer vision, each 15 minutes long.

Access to Private Inner Circle

You get access to a private online and Whatsapp community where you can network with other students and industry professionals. Ask questions and get feedback on your projects.
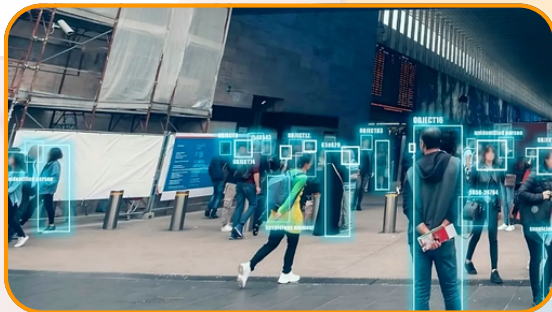
Monthly A.I. Challenges

Gain new skills in our Inner Circle with additional monthly projects & challenges that provide hands-on experience applying your A.I. knowledge in creative ways, expanding your expertise beyond the course material.

Computer Vision Internship Opportunities

Augmented Startups offers internships and apprenticeships to launch your career in AI. Gain hands-on experience and real-world skills to succeed in this growing industry.

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[Bonus] ChatGPT Prompt Engineering Course

Join the ChatGPT revolution and become an expert prompt engineer with our cutting-edge course. Learn to generate natural language text and automate tasks using AI.

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University

Computer Vision Foundations

Computer Vision Foundations: Dive into OpenCV, face recognition, neural networks, and advanced detection with YOLO. Learn pose estimation, segmentation with Mask R-CNN, SiamMask, and app development.

Computer Vision Foundations

- **Module 1: Introduction**
- **Module 2: OpenCV Python Course**
- **Module 3: Face Recognition Attendance GUI PyQt - 1 Hour Course**
- **Module 4: Neural Networks Fundamentals**
  - Neural Networks Fundamentals-Course
  - YOLO - You Only Look Once
  - Mask R-CNN
  - OpenPose Pose Estimation
  - Where to go from here
- **Module 5: YOLOv4 Nano-Course**
- **Module 6: YOLOv3 Robust Object Detection**
  - YOLO v3 - Robust Deep Learning Object Detection in 1 hour
- **Module 7: Pose Estimation Development using OpenPose Framework**
  - App Development with AI Pose Estimation
- **Module 8: Mask R-CNN - Practical Deep Learning Segmentation in 1 hour**
- **Module 9: SiamMask Starters Course**
  - Introduction to Siam Mask
  - Siam Mask Paper Breakdown
  - Environment Setup and Getting Started
- **Module 10: OpenCV AI Kit Lite**
  - Introduction
  - Lecture
- **Module 11: Detectron2 Lite**
  - Detectron Introduction
  - Back to Basics
  - Detectron2: What?
  - Detectron2: How?
  - Detectron2 Installation
- **Module 12: Build Tkinter Apps**
- **Module 13: AS-One Computer Vision Workshop**

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ChatGPT Pro Course

Explore ChatGPT: Learn its fundamentals, use cases from code debugging to creative writing, and innovative applications including AI art ideas, music creation, and emotional support. Expand your skills.

ChatGPT
A COMPLETE BEGINNER'S COURSE

AUGMENTED STARTUPS

FREE

ChatGPT Pro Course

- Lesson 1. What is ChatGPT?
- Lesson 2. ChatGPT: How to use it?
- Lesson 3. Applications of ChatGPT
- Lesson 4. Limitations of ChatGPT
- Lesson 5. Use ChatGPT as a Linux Terminal
- Lesson 6. Debug Code
- Lesson 7. Write Code
- Lesson 8. Play Tic-Tac-Toe
- Lesson 9. Explain Things
- Lesson 10. Get Ideas for AI Art, Decoration, Party Themes
- Lesson 11. Find Answers to Homework and Assignment Questions with ChatGPT
- Lesson 12. Use ChatGPT to Write Music
- Lesson 13. Use ChatGPT for Translations
- Lesson 14. Extract Data from Text
- Lesson 15. Write a Twitter thread
- Lesson 16. Write a novel till translation on the go
- Lesson 17. Guest speaker Q&A prompts
- Lesson 18. Creating games

- Lesson 19. Dealing with loneliness and anxiety
- Lesson 20. Naming things
- Lesson 21. Translation on the go
- Lesson 22. Fitness
- Lesson 23. Coding and integrations
- Lesson 24. Lesson plans for teachers
- Lesson 25. Find podcast guests
- Lesson 26. Handle social media comments and reviews
- Lesson 27. Crime fighting
- Lesson 28. Furniture design
- Lesson 29. Create a serialised novel
- Lesson 30. Prep for an interview
- Lesson 31. Gift ideas
- Lesson 32. Explaining complex concepts
- Lesson 33. Editing for AP style

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AI in Agriculture Pro Course

Explore AI in agriculture: Enhance crop yields, disease identification, precision farming, weather & pest prediction, irrigation optimization, and livestock health monitoring for sustainable farming.

AI in Agriculture Pro Course

- **Module 1: Welcome to the Course**
- Module 2: Emerging Technology in Agriculture
  - Emerging Technologies
  - Problems in Agriculture
  - Goal of using AI in AgricultureModule 2: Emerging Technology in Agriculture
- **Module 3: Crop-Related Applications**
  - Nutrient Deficiency Detection
  - Plant Species Recognition
  - Crop Disease Identification
  - Soil Quality Analysis
  - Predictive Analytics for Crop Yield
  - AI in Precision Farming
- **Module 4: Weather Related Application**
  - Weather Prediction Model (Machine Learning, LangChain, LLMs)
  - Weather based pest prediction.
  - Heat stress mitigation.
- **Module 5: Water-Related Applications**
  - Water Quality Assessment
  - Irrigation Optimisation
  - Drought Impact Prediction
- **Module 6: LiveStock-Related Applications**
  - Automated Livestock (Pig) Counting
  - Fish Farming Monitoring
  - Automated Cattle Monitoring and Health Assessment

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LangChain Chatbots Application Pro Course

Dive into LangChain & chatbots: Learn core concepts like Chain of Thought & Prompt Chaining, build applications ranging from SEO to healthcare, and unlock the potential of conversational AI.

LangChain Chatbots Application Pro Course

- **Module 1: Getting Warmed Up**
  - Welcome to the Course
  - Course Overview
  - How to get Help Benefits and Certificates

- **Module 2: Introduction to LangChain & Chatbots**
  - What is LangChain
  - LangChain Quiz
  - LangChain Course Overview
  - Key Concepts in LangChain:
    - Chain of Thought
    - Action Plan Generation
    - ReAct
    - Self-ask
    - Prompt Chaining
    - Memetic Proxy
    - Self Consistency
    - Inception
    - MemPrompt

- **Module 3: LangChain Applications**
  - App 1: VegGPT
  - App 2: ChatGPT Streamlit SEO
  - App 3: Front-end Development: CHATBOT
  - App 4: Database ChatBot
  - App 5: Blog ChatBot
  - App 6: PDF Chat
  - App 7: Youtube Summarizer
  - App 8: Healthcare Database Chatbot
  - App 9: News Aggregator Chatbot
  - App 10: Interactive Coding Tutorial Chatbot
  - App 11: E-commerce Chatbot
  - App 12: Document Translation Chatbot:
  - App 13: Mental Health Support Chatbot
  - App 14: Career Advisor Chatbot
  - App 15: Financial Advisor Chatbot

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AI in Trading Pro Course

Dive into U-Net Segmentation: Explore theory, implementation, dataset management, training, and advanced applications. Master semantic segmentation with hands-on projects from image enhancement to medical diagnostics.

Artificial Intelligence in Trading
CRYPTO | FOREX | STOCKS

AI in Trading Pro Course

- **Module 1: Introduction to AI in Trading**
  - Overview of AI in Financial Markets
  - Python for Trading: Essential Libraries
  - Fundamentals of Trading Bots
  - Risk Management in AI Trading
- **Module 2: Building Your First Trading Bot**
  - Data Acquisition Techniques
  - Basic Algorithm Design and Testing
  - Backtesting and Performance Analysis
- **Module 3: Trading Analysis Techniques**
  - Principles of Fundamental Analysis
  - Technical Analysis: Charts and Indicators
  - Integrating Fundamental and Technical Analysis
- **Module 4: Sentiment Analysis in Trading**
  - Basics of Market Sentiment Analysis
  - Sentiment Analysis with NLP (LLM)
  - Integrating Sentiment into Trading Strategies
- **Module 5: Deep Learning in Financial Markets**
  - Introduction to Deep Learning Concepts
  - Time Series Prediction with LSTMs
  - Pattern Recognition with CNNs
  - Anomaly Detection using Auto-encoders
  - Synthetic Data Generation with GANs

- **Module 6: Leveraging Large Language Models**
  - Introduction to ChatGPT in Finance
  - Developing Custom Financial Bots
  - LLMs for Regulatory Compliance
  - Custom Sources
  - Hybrid Models: LLMs and Traditional AI
- **Module 7: Reinforcement Learning in Trading**
  - Basics of Reinforcement Learning
  - Building RL-based Trading Strategies
  - Advanced RL: DQN and PPO
- **Module 8: Optimisation and Yield Maximisation**
  - Techniques in Model Optimisation
  - Ablation Studies for Performance Improvement
- **Module 9: Best Practices and Real-World Applications**
  - Developing Optimal Trading Strategies
  - Switching between Paper Money and Real Money.
  - Comprehensive AI Trading Bot Project
  - Real-World Case Studies and Analysis

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YOLO-NAS & v8 Ultra Course

Discover YOLO-NAS+v8: Understand architecture, train with custom data, track objects, convert models, integrate with Flask, develop Kivy mobile apps, segment objects, and deploy solutions effectively.

YOLO-NAS & v8 Ultra Course

- **Module 1: YOLO-NAS + v8 Introduction**
  - Introduction to YOLO-NAS + v8
  - Architecture of YOLOv8 and comparison to other models
  - Running YOLO-NAS + v8 on Ubuntu
  - Running YOLO-NAS + v8 on Windows
  - YOLO-NAS + v8 Object Detection on Images, Videos, and Webcam in Google Colab
  - Common use cases for YOLO-NAS + v8
  - Fine-tuning pre-trained YOLO-NAS + v8 models
- **Module 2: Training Custom YOLO-NAS + YOLOv8**
  - Training Process for both YOLO-NAS + v8
  - Custom Dataset Waste Sorting Detection
  - Data Pre-processing
  - Data Augmentation
  - Training, Testing, and Deploying Model on Roboflow
  - Using Roboflow models for AI data annotation
  - How to train YOLO-NAS
  - How to train YOLOv8
- **Module 3: YOLO-NAS + v8 Object Tracking**
  - Introduction to Multi-Object Tracking (MOT)
  - YOLO-NAS + v8 with StrongSORT
  - YOLO-NAS + v8 with Bytetrack
  - YOLO-NAS + v8 with FairMOT
  - Integrating YOLO-NAS + v8 + tracking on Streamlit dashboard
- **Module 4: Model Conversion**
  - Overview of model conversion
  - Setting up the environment for model conversion
  - Converting PyTorch models to CoreML
  - Converting PyTorch models to OpenVino
  - Converting PyTorch models to TensorFlow
  - Converting PyTorch models to TensorRT

- **Module 5: Flask Integration**
  - Setting up Flask Application
  - Integrate YOLO-NAS + v8 with Flask
  - Designing Front-End
- **Module 6: YOLO-NAS + v8 Flask Apps**
  - App 1 - Retail Heat Maps
  - App 2 - Mining Safety Check
  - App 3 - Plastic Waste Detection
  - App 4 - Smoke Detection
  - App 5 - CS-GO Gaming Aimbot
- **Module 7: Mobile Development Using Kivy**
  - Introduction to Mobile Development
  - Setting up Kivy Application
  - Setting up a Dashboard
  - Integrating YOLO-NAS + v8 with Kivy
  - Conversion to TFlite
  - Widgets and Buttons in Kivy
  - Deployment and Testing
  - Building and distributing the app
  - Updating the UI/UX and wireframes for the app
- **Module 8: Mobile Apps**
  - Introduction to Mobile Apps
  - App 1 - People counting over Time
  - App 2 - Document Scanner (using Easy-OCR)
  - App 3 - Sign-Language Recognition
  - App 4 - Bar Graph Widget Visualization
- **Module 9: Object Segmentation**
  - Introduction to Object Segmentation
  - Setting up the Object Segmentation model
  - Data Collection, Annotation, and Health checker
  - Data Pre-processing and Augmentation
  - Training on GPU and deployment
  - Crack detection and measuring the pixel size.
  - YOLO-NAS + SAM Segmentation
- **Module 10: Deployment**
  - Docker Container Deployment
  - Deployment to Jetson Nano

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U-Net Segmentation

Dive into U-Net Segmentation: Explore theory, implementation, dataset management, training, and advanced applications. Master semantic segmentation with hands-on projects from image enhancement to medical diagnostics.

U-Net Segmentation

- **Module 1: Introduction & Theory**
  - What is Semantic Segmentation?
  - What is U-Net?
  - Effectiveness of U-Net
  - Architecture Comparison
  - Performance Comparison
  - Why U-Net?
- **Module 2: U-Net Implementation**
  - Going through the research paper
  - Encoder block implementation
  - Decoder block implementation
  - UNET Model
    - Ubuntu
    - Colab
- **Module 3: Dataset**
  - Dataset sources
    - Where to find Standard Dataset
  - Creating Dataset
    - Collecting Images
    - Annotation
  - Dataset Management
    - How to deal with faulty images in the dataset?
    - Cleaning Datasets
    - Places to store the dataset(cloud options)
- **Module 4: Training**
  - The process of training UNET
  - Dataset processing
  - Data augmentation

- UNET Model
- Training
  - Ubuntu
  - Colab
- **Module 5: Evaluation & Deployment**
  - Loading the model
  - Loading the test dataset
  - Predicting the mask
  - Evaluating the predicted mask
    - F1
    - mIoU
    - Precision, Recall, & Accuracy
    - Calculating FPS
- **Module 6: Advance Topic**
  - Transfer Learning on UNET
  - Attention mechanism in UNET
  - Convert Mask to the bounding box
  - UNET for object detection
  - Counting objects using UNET
- **Module 7: Apps**
  - App 1 - Human Image Segmentation
  - App 2 - Background Removal
  - App 3 - Blur Background
  - App 4 - Face Privacy Blurring
  - App 5 - Hair Color Change
  - App 6 - PolyP Segmentation
  - App 7 - Cell Nuclei Segmentation
  - App 8 - Brain Tumor Segmentation

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AI Influencer Pro Course

Discover YOLO-NAS+v8: Understand architecture, train with custom data, track objects, convert models, integrate with Flask, develop Kivy mobile apps, segment objects, and deploy solutions effectively.

AI Influencer Pro Course

- **Module 1: Introduction to Stable Diffusion and AI Influencers**
    - 1.1: Understanding Stable Diffusion
        - Overview of Stable Diffusion technology.
        - How it powers AI influencer generation.
        - Real-world examples of AI influencers.
    - 1.2: The Landscape of AI Influencers
        - History and evolution of AI influencers.
        - Case studies: Success stories and challenges.
        - Ethical considerations and transparency in AI influencer creation.
- **Module 2: Setting Up Stable Diffusion**
    - 2.1: Environment Setup for Different Operating Systems (Linux, Windows, MacOS, & Google Colab)
    - 2.2: Troubleshooting and Optimization
        - Common issues and their resolutions.
        - Optimizing performance for different systems.
- **Module 3: Creating Your AI Influencer**
    - 3.1: Exploring Stable Diffusion Settings
        - Introduction to the Fooocus repository.
        - Understanding different settings options available.
        - Link to the Fooocus repo and resources.
    - 3.2: Designing the Influencer
        - Conceptualizing your AI influencer's persona.
        - Generating the first images.
        - Guided tutorials on using prompts.
        - Best practices for initial image generation.
    - 3.3: Finalizing the Base Images
        - Selecting and refining the base images.
        - Techniques for enhancing image quality and consistency.
    - 3.4: Advanced Prompt Engineering
        - Creative prompt engineering techniques.
        - Crafting prompts for different moods, settings, and themes.
        - Keeping the AI influencer consistent in terms of looks
- **Module 4: Video generation using FaceFusion**
    - 4.1: Setting Up on Different OS (Linux, Windows, Google Colab & MacOS)
        - Setting up FaceFusion on Linux & Colab.
        - Setting up FaceFusion on Windows.
        - Setting up FaceFusion on MacOS.
    - 4.2: Exploring FaceFusion Settings
        - Introducing our own Influencer Liyana Cortez.
        - Introduction to the FaceFusion repo.
        - Understanding the different setting options available in the repo.
        - Ethics of AI Generation.
    - 4.3: Generating Videos with FaceFusion
        - Selecting target videos for AI influencer.
        - Selecting optimal parameters for video generation.
        - Finalizing and exporting the videos.

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Generative Adversarial Networks PRO

Generative Adversarial Networks PRO: Dive into GAN history, training cycles, and implementations. Master challenges, and explore applications from image translations to AI-based image generation.

Generative Adversarial Networks PRO

- **Module 1: Introduction and an Overview to GANs**
  - 1.1 Introduction and History of GAN
  - 1.2 Generative Models
  - 1.3 Why do We Use GANs?
  - 1.4 Types of GANs Translations
  - 1.5 Application Areas Part 1
  - 1.6 Application Areas Part 2
  - 1.7 Components of GANs
  - 1.8 How do GANs Work and Loss Function
- **Module 2: Vanilla GAN Training Cycle and Basic Building Blocks**
  - 2.1 Vanilla GAN Training
  - 2.2 Training the Generator and the Discriminator
  - 2.3 The Objective Function
  - 2.4 The Training Cycle and Basic Building Blocks
- **Module 3: Implementation of Vanilla GAN**
  - 3.1 Generic Architecture of a GAN
  - 3.2 Importing the Library
  - 3.3 Configurable Variables
  - 3.4 Building the Generator
  - 3.5 Building the Discriminator
  - 3.6 Combining Everything Into One (Housekeeping Functions)
  - 3.7 Preparing the Dataset
  - 3.8 Initialization Functions
  - 3.9 Forward and Backward Pass
  - 3.10 Performing a Training Step
  - 3.11 Performing an Epoch
  - 3.12 Starting the Training Process
- **Module 4: Challenges and Basic Building Blocks of GANs**
  - 4.1 Challenges and Basic Building Blocks of Generative Adversarial Network
  - 4.2 Challenges of GANs
  - 4.3 Challenges of GANS - Output Control
  - 4.4 Improved GANs - Convolutional Layers
  - 4.5 Convolutional Layer - Parameter Sharing
  - 4.6 Convolutional Layer - ConvNets Visualization
  - 4.7 Convolutional Layer - Generator Network Diagram
  - 4.8 Convolutional Layer - Discriminator Network Diagram
  - 4.9 Improved GANs - Pooling Layer
  - 4.10 Improved GANs - Loss Functions (WGAN)
  - 4.11 Improved GANs - Loss Functions (CGAN)
- **Module 5: Applications of GAN with Implementation**
  - 5.1 Image-to-Image Translation Using CycleGAN
  - 5.2 Text-to-Image Translation using ClipBigGAN
  - 5.3 Interactive Image Generation using Interactive GAN
  - 5.4 Photos to Animations(Emojis) using ArcaneGAN
  - 5.5 Enhancing The Resolution of an Image using ESRGAN
  - 5.6 Image Generation using StyleGAN3
- **Module 6: AI Based Image Generation**
  - 6.1 Introduction to AI-Based Image Generation
  - 6.2 AI-Based Image Generators - Midjourney
  - 6.3 AI-Based Image Generators - DALL-E 2
  - 6.4 AI-Based Image Generators – Imagen
  - 6.5 AI-Based Image Generators - Stable Diffusion

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YOLOv7 Full Stack PRO

YOLOv7 Full Stack PRO: From YOLOv7 basics, custom training, tracking, Flask integration, to building apps for security, retail, and traffic management. Learn model conversion and pose estimation.

YOLOv7 Full Stack PRO

- **Module 1: Introduction**
  - 1.1 Introduction to YOLOv7
  - 1.2 Run YOLOv7 on Windows 10/11
  - 1.3 Run YOLOv7 on Ubuntu
  - 1.4 Research Paper
- **Module 2: Training Custom YOLOv7 [Using Roboflow Platform]**
  - 2.1 Training Process of YOLOv7 PPT
  - 2.2 Training your Custom YOLOv7 Model
  - 2.3 Data Collection
  - 2.4: Data Annotation
  - 2.5: Dataset Bias & Health
  - 2.6: Data Pre-processing
  - 2.7: Data Augmentation
  - 2.8: Roboflow train
  - 2.9: Training Prerequisites
  - 2.10: How to tune your training parameters
  - 2.11: How to analyze your model performance
  - 2.12: Active learning for faster automated annotation
  - 2.13: Training Model
  - 2.14: Deploying Model
- **Module 3: YOLOv7 + Tracking Intro**
  - 3.1 Multi-Object Tracking (MOT)
  - 3.2 Integrating YOLOv7 with Byte Track Windows 10/11
  - 3.3 Integrating YOLOv7 with Nor -Fair Windows 10/11
- **Module 4: Flask Integration**
  - 4.1 How to connect Flask with Yolov7
  - 4.2 Fundamentals of Computer Vision with Front-End WebApp
  - 4.3 Integration of YOLOv7 with front end
  - 4.4 Widget and Buttons
  - 4.5 Minimalistic Front End Design
- **Module 5: YOLOv7 Apps**
  - App 1 - Security with Dashboard
  - App 2 - Mining Safety Check (Hard hat, Glasses, and Vest)
- App 3 - Retail Heat Maps - Check heatmaps density
- App 4 - Agriculture Count Fruit and display on Widget
- App 5 - Traffic, Vehicle Counting, Tracking, and speed calculation
- App 6 - License Plate Recognition with Dashboard - Easy OCR
- App 7 - Gaming Aimbot with YOLOv7
- App 8 - Whiteboard Drawings to Web page generation using YOLOv7
- Docker Video
- **Module 6: Model Conversion**
  - 6.1 Pytorch->ONNX->TensorFlow
  - 6.2 Pytorch->ONNX->CoreML
  - 6.3 Pytorch->ONNX->OpenVino
  - 6.4 Pytorch->ONNX->TensorRT
  - 6.5 Pytorch->ONNX->DeepSparce
- **Module 7: Pose Estimation**
  - 7.1 Getting started with YOLOv7 Pose Estimation
  - 7.2 Bicep Curl Application
  - 7.3 Yoga Pose Identification
  - 7.4 Fall Detection
- **Module 8: Object Segmentation**

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Jetson Computer Vision

Dive into U-Net Segmentation: Explore theory, implementation, dataset management, training, and advanced applications. Master semantic segmentation with hands-on projects from image enhancement to medical diagnostics.

JETSON
COMPUTER VISION COURSE
PRO
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Jetson Computer Vision

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Self-Driving Car PRO

Self-Driving Car PRO: Covering fundamentals, system design, control systems, computer vision, ROS simulations, and Jetbot experimentation. Gain in-depth knowledge on autonomy levels, PID control, SLAM, and object detection.

Self-Driving Car PRO

- **Module 1: Fundamentals of Self-Driving Cars**
  - Introduction to Self-Driving Cars
  - Evolution of Autonomous Car Technologies
  - Levels of Driving Automation
  - Commonly Used Hardware and Software
  - Safety Frameworks for Autonomous Vehicles & Case Studies
  - Topology of Self Driving Cars
  - Vehicle Events & Decision Making
- **Module 2: Self-Driving Car System Design**
  - SDC Hardware Overview
  - SDC Software Overview
  - System Design Architecture
- **Module 3: Control Systems**
  - Introduction to Longitudinal Control with Proportional-Integral-Derivative (PID) controller
  - Importance of Feed-forward Speed Controller
  - Kalman Filters
  - Vision-based Adaptive Cruise Control
  - State Estimation and Localisation using SLAM
  - Modeling Motion with Motion Aware Prediction (MAP)
  - Incorporating time-to-collision (TTC) in decision making
  - Efficient Collision Detection Method
  - Simulation in Robot Operating System (ROS)
- **Module 4: Computer Vision for Visual Perception**
  - Introduction to Computer Vision for Road Scene Understanding
  - 2D & 3D Object Detection & Tracking
  - Semantic Segmentation for Detecting Drivable area
  - HydraNets
  - Stereo Vision & Point Clouds
  - Real-Time Vision Depth Perception on Jetson Nano
- **Module 5: ROS Simulation of Autonomous Vehicle**
  - Introduction
    - Gazebo & ROS2 Setup & Installation

  - Environment Setup
    - Model Car Creation
    - Road Initialisation & Mapping
  - ROS2 Implementation
    - Lane Segmentation
    - State Estimation
    - Modeling Motion with Motion Aware Prediction
    - Incorporating time-to-collision (TTC) in decision making, Obstacle avoidance
  - Autonomous Vehicle Localization
    - LiDAR Sensing
    - Vision-based Adaptive Cruise Control State Estimation
- **Module 6: Jetbot Implementation - Integration & Experimentation**
  - 6.1: Jetbot Setup
    - 6.1.1 Jetson Nano Setup: Get your hardware ready.
    - 6.1.2 Jetbot Hardware Assembly: Put your Jetbot together like Lego.
  - 6.2: Testing with I/O Device
    - 6.2.1 Basic Motion Teleoperations: Learn the A, B, C's of moving your Jetbot.
  - 6.3: 2D & 3D Object Detection
    - 6.3.1 Collision Avoidance: Make your Jetbot street-smart.
    - 6.3.2 Road Following: Teach your Jetbot to stick to its lane.
    - 6.3.3 Object Following: Make your Jetbot your follow objects.
  - 6.4: Stereo Vision & Point Clouds
    - 6.4.1 Real-Time Depth Perception: See the world through Jetbot's eyes.
  - 6.5: Testing
    - 6.5.1 In Real Life (IRL) Testing: The final boss level

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OpenCV AI Kit

OpenCV AI Kit Course: From basics of installation, image operations, to advanced techniques like color detection and object tracking. Includes projects on face detection, classification, and optical flow.

OpenCV AI Kit

- Introduction
- Downloading and Installing OpenCV
- Reading an Image
- Displaying an Image
- Saving an Image
- Accessing Image Properties
- Changing Color Space
- Resizing the Image
- Displaying Text
- Drawing a Line
- Drawing a Circle
- Drawing a Rectangle
- Drawing an Ellipse
- Display Images in Multiple Modes
- Playing Webcam Video
- Capture Videos Using OpenCV
- Playing Video from File
- Basic Operations on Images using OpenCV
- Access Pixel Values and Modify Them
- Access Image Properties
- Setting Region of Image
- Splitting and Merging Images
- Change the Image Color
- Blend Two Different Images
- Apply Different Filters on Images
- Image Thresholding
- Contour Detection and Shape Detection
- Color Detection
- Object Replacing in 2D Image using OpenCV
- Projects Overview
  - Project 1 - Face Detection and Blurring
  - Project 2 - Deep Image Classification
  - Project 3 - Object Detection
  - Project 4 - Object Tracking
  - Project 5 - Image Warp Perspective
  - Project 6 - Optical Flow

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Siam Mask PRO
Self-Driving Car PRO: Covering fundamentals, system design, control systems, computer vision, ROS simulations, and Jetbot experimentation. Gain in-depth knowledge on autonomy levels, PID control, SLAM, and object detection.

Siam Mask PRO

- **Module 1: Introduction to Siam Mask**
  - Tips for Successfully Completing the Course
  - How to take this Course
  - Object Tracking Intro
  - Single and Multi-Object Video Object Tracking
  - Object Segmentation
  - Siam Mask Object Segmentation Tracking
  - Siam Mask Course Overview
- **Module 2: Siam Mask Paper Breakdown**
  - How does Siam Mask Work Intro
  - A Fully Convolutional Siamese Network
  - SiamFC and Siam RPN
  - Siam Mask
  - Implementation Details
  - Siam Mask Performance
  - Results of Siam Mask
- **Module 3: Environment Setup and Getting Started**
  - Environmental Setup Intro
  - What you will Need
  - Setup and GitHub Code
  - Anaconda Setup
  - Setup Python Environment
  - Running the Demo
  - Demo Analysis
  - Key Take-away
- **Module 4: Working with your own Dataset**
  - Using your Own Dataset Intro
  - Siam Mask Execution Commands
  - Converting the Dataset into Images
  - Running the Demo on your own Dataset
  - Activity - Test it on your own video
- **Module 5: Error Handling**
  - A1-Error Handling - jitdebug
  - A2-Error Handling - CUDA
  - A3-Error Handling - NoneType
  - A4-Error Handling - Checkpoint e9
  - A5-Error Handling - jq- command not found
  - A6-Error Handling - NAN FPS
- **Bonus**
  - YoloV4 Integrated with SiamMask[Code Only]

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