



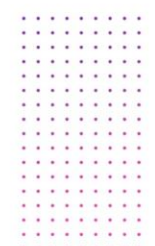
sentilient

ACADEMY

AI CENTER OF EXCELLENCE



COMPUTER VISION BOOTCAMP



Computer Vision Bootcamp Overview

This is a certification course that will cover knowledge and practical's of Computer Vision Applications that will help you achieve this most sought-after skillset and achieve expertise in it. Cohorts will get access to the world's industry leader's webinars and lecture series along with the access to state-of-the-art infrastructure to practice their skills. Unlock your Computer Vision Potential with this 4 weeks course. During this intensive, full-time bootcamp, you will go from learning the fundamentals of Computer Vision all the way to implementing your own neural network and applying it to a real-world problem. Computer Vision's comprehensive curriculum covers all key aspects and its application across a multitude of fields. We believe in 'learning by doing' method & this Bootcamp will be focused on real-time projects and experience-driven teaching.

This bootcamp is focused on individuals who wish to excel their career as a Computer Vision Engineer & this bootcamp will help you to understand the real-world Computer Vision modeling.

By the end of the bootcamp, you will be able to implement Computer Vision projects within your professional environment and will possess the necessary foundations to build up your expertise further.

Cohorts will develop modules in:

1. Retail
2. Dentistry
3. Autonomous cars
4. Smart tolls

Our Learning Methodology

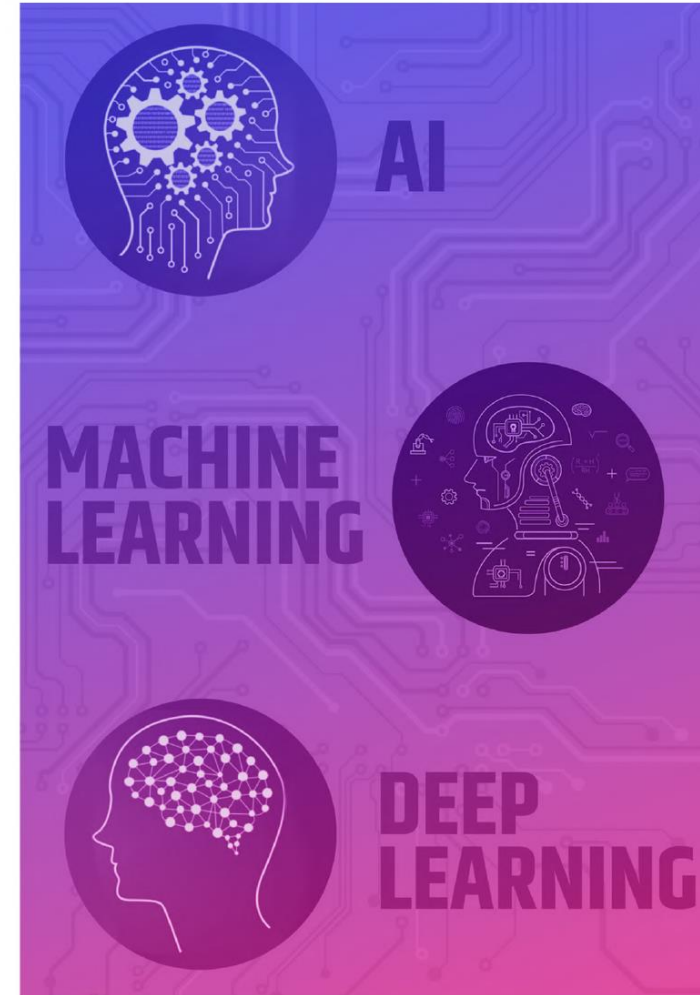
- With the approach of “Learning by Doing”, the bootcamp is bifurcated into 80% practical and 20% theory, we help students to grasp the core of AI. Hands-on experience will be gained by building a AI Application with your team of highly motivated participants.
- Interaction, team emulation, and nonverbal communications are vital in achieving learning objectives.
- This training is an essential one to succeed in the AI-powered world!
- Working on live projects will make cohorts confident and increase its productivity in the practical AI world.



Curriculum Overview

The program is structured around 6 core modules:

1. Computer Vision Essentials
2. Microservices & DevOps
3. Deep learning Pre-Requisites
4. Neural Networks and Deep Learning
5. Computer Vision Applications
6. Capstone Project



Module 1. Computer Vision Essentials

In this module, we will give a brief focus on Linux OS, ML algorithms, libraries, various tools like Jupyter Notebooks, Google Co-Labs, PyCharm, etc.

Learning Python will be placing a right foot towards your Computer Vision journey. Being a general-purpose language, and its simple to read & write design makes Python a primary language with very reliable, efficient and easy to learn functionality.

This module will take you deeper into the flow of Python and its verticals which will make you an expert in this fundamental language.

Linux & GIT

- Unix File System
- Directory
- File Handling
- GIT
- GIT Directory
- GIT Repository
- GIT Commands

Python

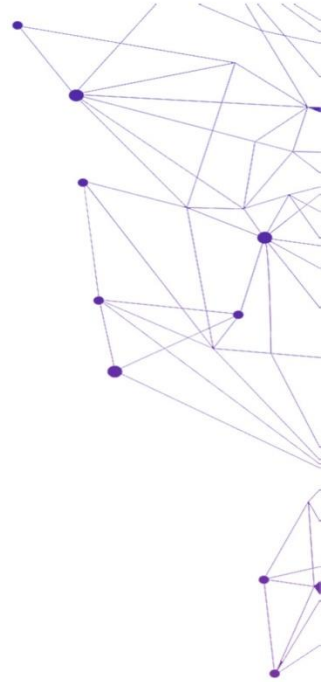
- Data Types
- Containers
- Input & Output
- SkLearn
- Numpy
- Scipy
- Matplotlib
- Pandas
- Jupyter Notebooks
- Google Co-Labs

Math Review

- Vectors & Matrices
 - Matrix Operations
- Determinants
- Eigenvalues & Eigenvectors
- Derivatives
- Gradient Descent
- Statistics & Probability

Data Augmentation

- DL Data preparation
- ADVIT



Module 2. Microservices & DevOps

Its the chain of rings, which cannot be missed. Similarly, are all the modules in this series, nothing should be missed. This module is focused on tools needed to develop the end-end Computer Vision Applications including industry used microservices & messaging protocols like Kafka & other DevOps tools.

Microservices & DB

- Messaging
 - Apache Kafka
- API Integration
- Postman
- Databases
 - SQL
 - MongoDB

DevOps Tools

- Kubernetes
- Dockers & Containers

Module 3. Deep learning Pre-Requisites

In this module cohorts will indulge in the real-time Deep learning training which is a set of advanced machine learning techniques.

It will start with Image/Video pre-processing and its plugins integrated with the embedded edge-devices used for data extraction. This module also covers the industry practices which are followed for data & model governance. Cohorts will acquire the knowledge of Neural Networks, with hands-on training on its advanced tools & frameworks like Tensorflow & Keras.

ML Frameworks & Compilers

- OpenCV
- Keras
- Tensorflow 2.0
 - Tensorboard
- CUDA

DL Training & Inference Infrastructure

- GStreamer
- Deepstream Video Pipeline
- AI edge devices
 - Intro to Jetson TX2
 - Intro to AGX Xavier
 - Intro to Jetson Nano
- DL Model Life Cycle
- Datasets Overview

Module 4. Neural Networks and Deep Learning

Neural Networks

- Single Layer Perceptron
- Multi Layer Perceptron
- Backpropagation

Regularization

- Overfitting
- Underfitting
- Cost function

GANs & Autoencoders

- GANs Introduction
- GANs Variants & Applications

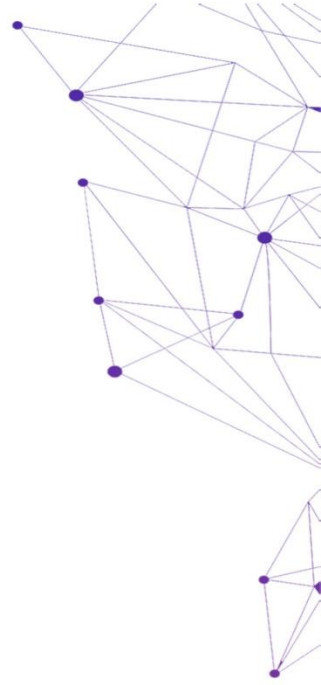
Convolutional Neural Networks (CNNs)

- Intro to CNNs
- Layer Operations
- Convolution Layer
- Activation Layer
- Dropout Layer
- Pooling Layer
- Batch Normalization Layer
- Loss Functions
- CNN architectures
- Transfer Learning
- DNN Model Optimizers
- Convergence & Hyper-Parameter Tuning
- Model Ensembling

Master the advanced deep learning techniques which will give you a wide knowledge on edge cutting applications, including image recognition, object detection, self-driving cars, and more. This module will build a strong foundation of the student, in Deep learning and developing real-time CV applications.

This module is prepared to make sure that cohort's develop tons of DL models for different CV applications with the compute infrastructure provided to attendees.

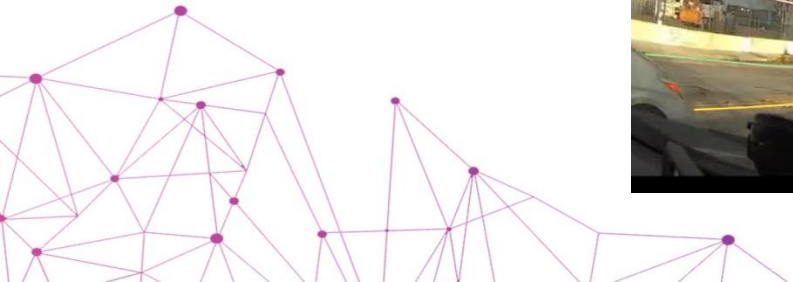
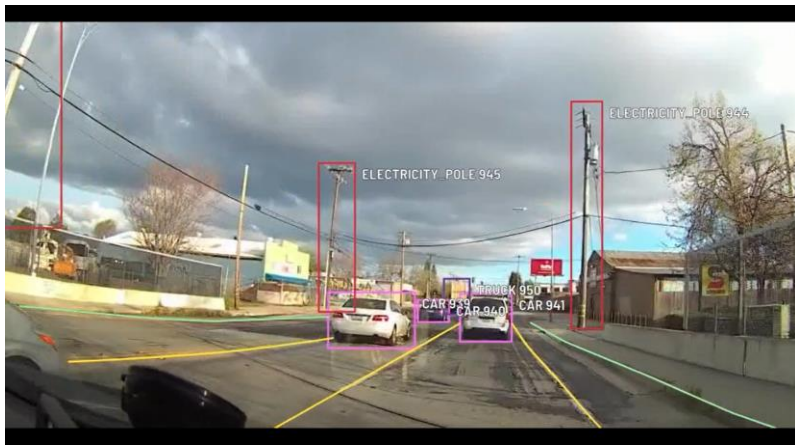
Module 5. Computer Vision Applications (Building & Deploying Large Scale CV-Applications)



This module will focus on making the cohort work on real-time projects & AI applications. The cohort will be given a personalized follow-up on AI project of their choice. Also a focus will be given on building AI ethics, with capstone projects ranging from simple applications of facial recognition to driverless cars.

Also a visionary approach and hands-on on data labelling tool “ADVIT”, which is proprietary to the Sentilgent Academy, will be provided. This module will also make a cohort capable of developing end-to-end video analytics pipeline on real-time streaming data.

This module will come to an end with the demo, where the cohorts will share their AI expertise in front of public, potential employers or other professionals.

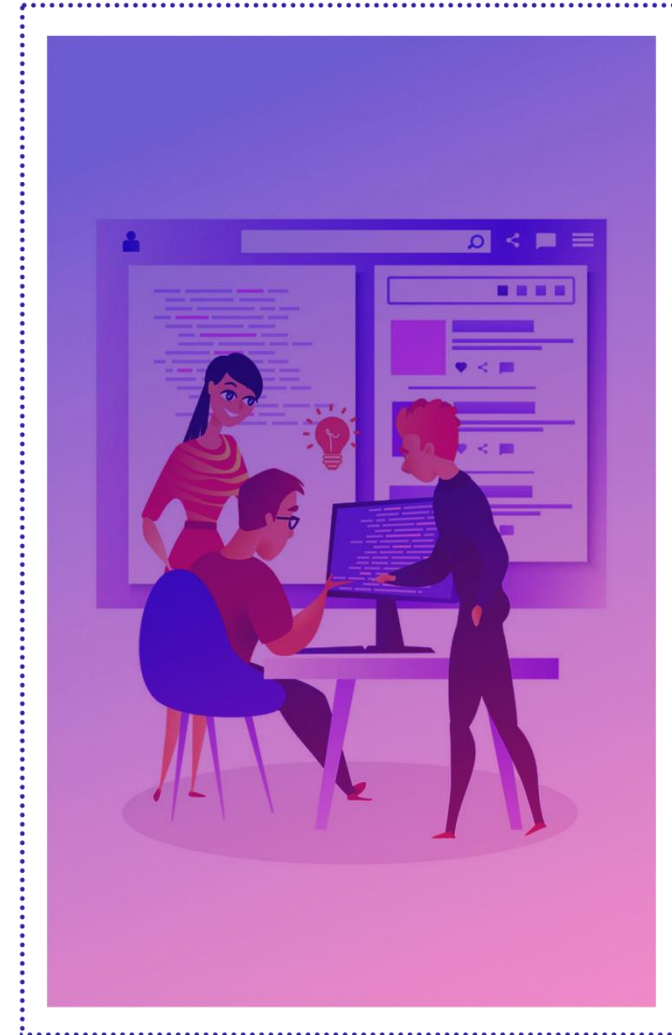


Module 6. Capstone Project

Project work

The program would not be complete without putting all the knowledge into an end-to-end CV application. Cohort will be given a personalized follow-up on the industry-led project, either working in teams or individually.

Creating a project from the scratch, with all the learnt tools and techniques and implementing an end-to-end CV application on a provided compute infrastructure and providing results via an API or a web service.



Computer Vision Capstone Project

You will be amazed by working on this kind of realistic projects, where your projects are applied around you in the society. Cohorts will have to complete one Computer vision project. Projects are mandatory for the certification. Capstone projects will give students an insight into the real-world CV project building.

Mentors will be there to help and guide students throughout the capstone.

Cohort's gets to choose which projects they want to build on ranging from the facial recognition to action recognition from videos. Cohorts will work on the real-time data for the same.

CV Capstone potential topics

- Caption Generation
- End-to-End Video Analytics pipeline for Retail Analytics
 - Person sentiment analysis using real-time IP Cameras.
 - Object detection
- End-to-end pipeline for the teeth analysis
- Gaming digital character generation using deep learning
- Autonomous Cars
 - Lane Detection
 - Surrounding Detection
 - Signboard detection
- Smart City Application
 - Traffic
 - Helmet detection
 - Number plate detection
 - Car detection (colour, car-make, type, etc.)
- Smart illegal dumping detection
- Action Recognition

Benefits from the Bootcamp

1. Internship opportunity in Computer Vision for industry experience.
2. Receive a Certificate of Bootcamp completion from Sentilient Academy
3. Understand Computer Vision's unique challenges and opportunities
4. Gain practical and strategic comprehension of Computer Vision Techniques.
5. Solve real CV problems through hands-on projects using CNN.

Bootcamp Delivery Method

- Online lectures with Hands-on real-time case studies will be given to the attendees (following COVID-19 guidelines)
- We will provide real-time data for the capstone projects in Bootcamp.
- We will provide the AI infrastructure needed for the bootcamp via VPN connection.
- Attendees receive an electronic copy of the course materials, literatures and related code at the conclusion of the Bootcamp.

Instructors

Bhushan Muthiyar



Bhushan is a data scientist professional, a software engineer who is keen on applying algorithmic models to ease business challenges by making cutting edge Artificial Intelligence accessible to all. He is Graduated from San Jose State University with MS in ML and Embedded Systems. He has an industry experience to generate breakthrough ideas and commercialize innovation and growth solutions on a global scale. He is specialized in designing and developing AI infrastructure for organizations. He is working with companies to create STRATEGIES and build business INNOVATION through smart adoptions of AI technology. His background and experience allow me to engage and provide services in the following areas:

- Machine Learning Modeling
- Deep Learning modeling
- Micro-services architecture

Sylvain Flamant



Sylvain obtained a 5-year Engineering degree in mechanics and optics at ENSMM in France. He served 17 months in Germany as an officer in the French army. He later earned an MSEE degree (1984) in signal processing and communications at Stanford University. Sylvain then put his DSP and telecom skills to good use, working as a DSP Engineer at Anritsu and Ikanos. His immense DSP skills landed him for the opportunity to work at At Wave Computing, where he was part of the Machine Learning core group, to implement and simulate ML models and to confirm the performance of the models on Wave Computing hardware using fixed-point and floating-point proprietary hardware data-types. He has patents multiple filed with his name ranging from DSP to ML modeling on different hardware. His area of expertise lies in:

- DSP
- Deep Learning
- ML Optimization & Quantization

Shreesh Dhavle



Post Graduation in Artificial Intelligence from the University of Essex, United Kingdom. His key focus in the areas of Deep Learning, Fuzzy logic systems and Explainable Artificial Intelligence. He was working as lab assistant in University of Essex for 1.5 years and was working as Assistant professor in symbiosis international university. He has a keen interest in offering alternative solutions to problems by combining approaches from various disciplines. His expertise lies in:

- Python
- Machine learning
- Deep Learning
- Power BI, SQLite

Aatish Langhee



Aatish is a Artificial intelligence and Deep learning professional, a application Engineer who has keen interest in delivering innovative and cutting edge AI, Machine Learning to enterprise and developing tomorrow's advances in AI. He is Post Graduated from College Of Engineering Pune (COEP) in VLSI and Embedded Systems. He has been working on deep learning methods, which is basics for many products and services. Aatish has a industry experience for generating various step forward solutions and ideas. He is been doing volunteering in AI field and is member of various community pune. His expertise is in the following areas:

- Artificial Intelligence
- Embedded Systems
- Microservices

Computer Vision Bootcamp Details

Batch & Time

- 4 weeks Bootcamp starting from **August 25, 2020**
- The program includes:
 - 4-days/week AI training (12 hours / week)
 - **Class times:**
 - Tue, Thur, Sat – 6 pm to 9 pm PST
 - Sun – 9 am to 12 pm PST

Tuition & Financing

\$750 / participant (inclusive all taxes)

Certificate

Participants will be granted a completion certificate from Sentilgent Academy, if they attend a minimum of 80% of the direct hours of the Program and after fulfilling program requirements (complete all assignments, capstones, etc. to obtain the certificate)



Admission Process

1. Please send us an email on admissions@sentiligentacademy.com with you Full Name, Contact Number, Bootcamp Batch you are interested in.
2. We will contact you on your phone / Email.
3. Admissions will be done on first come first serve basis.

Contact Us

We hope you find this Bootcamp favourable and in-line with your requirement. For any further questions, comments, or concerns, please feel free to contact us.

- **Website:** <https://sentiligentacademy.com/>
- **Email:** info@sentiligentacademy.com
- **Phone Number / WhatsApp Number:** +91 - 8600637568

