



Hands-On Practical Approach To Generative AI and Machine Learning



Training Program

In this program, attendees will get a solid introduction to the building blocks and components of artificial intelligence and learn about concepts like algorithms, machine learning and neural networks. Attendees will also explore how AI is already being used and evaluate problem areas of AI, such as bias. Attendees will learn how to build applied AI applications such as Natural Language Processing, Computer Vision and Edge Computing. Through hands-on projects, attendees gain exposure to the concepts of supervised and unsupervised learning, classification, optimization, reinforcement learning, and Blockchain, as well as Crypto Mining. The course will also teach the attendees how to build automations using UiPath Robotic Process Automation software (RPA). This course is ideal for those who are interested in understanding Artificial Intelligence, machine learning, Generative AI and Large Language Models.

PREREQUISITES

The attendees should have a fundamental knowledge of working with computers and cyber security. All attendees will receive online courseware and handouts.



Fundamentals of AI and Machine Learning, Applications, Challenges

- Real world applications of AI and how AI is transforming the world around us.
- Common AI terminologies: AI and ML definitions, history, current state, goals, types of models.
- Describe Artificial Intelligence workloads and considerations.
- Steps to creating a data science pipeline (Fetching Data, Training the Model, Inferencing)
- Applied Computer Vision and natural language processing (NLP)
- Alignment of AI Solutions with DoD AI Principles including Responsible, Equitable, Traceable, Reliable, Governable.
- Importance of Labeling data for AI and how to scale data for AI.
- Overview of Supervised, Unsupervised learning and Reinforcement Learning.
- Adversarial AI / Attacks on AI & How to Overcome them
- Detecting and Preventing Model Hallucinations & Model Drift
- Responsible AI & Removing AI Model Bias
- Installing Guardrails on Generative AI and LLMs
- NIST RMF & ISO Standards for Generative AI
- AI Governance and Privacy Measures
- Fusion of RPA/Intelligent Automation with AI
- Generative Adversarial Networks or GANs — technologies that can create visual and multimedia artifacts from both imagery and textual input data.
- Transformer-based models — technologies such as Generative Pre-Trained (GPT) language models that can use information gathered on the Internet to create textual content.
- Overview of High-Performance Compute (HPC) and GPUs, high-density racks, liquid cooling etc.
- Examples of Commercial AI / HPC solutions – Nvidia, Dell, HPE, H2O, AI, Deepgram, AI, Alteryx etc.

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EXCELLENCE THROUGH EDUCATION

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Generative AI and Large Language Models (LLMs): Overview, Applications, Challenges

- Generative AI (GAI) & LLM fundamentals level setting.
- A high-level overview of how Generative AI works and how models are trained.
- Real-world applications of Generative AI & Large Language Models (LLMs) in the DoD agencies.
- Benefits and challenges of using Generative AI in government agencies.
- Best practices for securely integrating DoD/agency data with LLMs.
- Identifying potential risks associated with Generative AI and LLMs.
- How AI can be hacked by poisoning the data.
- Strategies for mitigating risks and building robust AI systems.
- Overview of the NIST AI Risk Management Framework (RMF).
- Emerging trends and advancements in Generative AI and LLMs.
- Using Pre-Trained LLM Models from Hugging Face and other online libraries.



Learning AI Fundamentals using Hands-On Exercises using Nvidia Jetson Nano

- Overview of Jetson Nano and GPUs. Collect image data for classification models.
- Annotate image data for regression models.
- How to train a neural network on your data to create your own models.
- Running inference on the Jetson Nano with the models you create.
- Creating your own deep learning classification and regression models with the Jetson Nano.
- Running a Docker container to access JupyterLab and the course notebooks.
- Create a PyTorch project to train a deep neural network on your Jetson Nano, and experiment with image classification using data you collect with your camera.
- Train an image regression deep neural network model to infer X-Y coordinates for specific objects in images you collect with your camera.



Prem Jadhvani, CEO & President, Intellectual Point

Prem works as a Chief Executive Officer (CEO) & Founder of Intellectual Point – a Sterling VA based professional IT Training, Education & Solutions Provider. He also serves as a Chief Technology Officer (CTO) for Government Acquisitions - an IT Solutions Provider & Trusted Advisor to the Federal Government. His primary responsibilities include defining, developing and delivering professional, hands-on IT Trainings and Solutions in the areas of Cyber Security, Cloud Computing, Data Center, Networking, Big Data Analytics, Mobility, Internet of Everything and Emerging Technologies.

Mr. Jadhvani possesses 20 years of experience working in the enterprise IT space with both commercial and Federal customers. He has a strong blend of technology and marketing background and has worked with a number of Technology and Software firms, including TIBCO Software, See Beyond Technology Corporation (now acquired by Sun/Oracle), Infogix Systems Inc., GTSI Corporation and Unicom Government Inc.

Prem has a well-rounded and extensive product management experience and has a proven track record of successfully training, coaching and mentoring people and with hands-on marketable skills in areas such as Cyber Security, Cloud Computing and Project Management and preparing them for highly skilled IT and management careers in rapidly growing IT space. He provides technical and business expertise in Data Center, Green IT, Enterprise Networking, Information Assurance & Network Security, Unified Communications, Wireless, Virtualization & Cloud Computing solutions to customers and is a prominent speaker at various trade-shows and conferences. Prem was nominated and has served as a Commissioner for the 2012 TechAmerica STLG Cloud Computing Commission as well as 2012 TechAmerica Big Data Commission. Prem is an active contributor to various industry discussions, panels and his work and articles have been published in numerous journals and periodicals.

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