AI SOLUTION DEVELOPMENT

Through the Independent Research & Development (IR&D) organization within Technica Labs; Technica has pioneered next-generation applications of Artificial Intelligence (AI)/Machine Learning (ML). We work with defense, intelligence, and federal organizations to safely harness the power of AI for Cyber Warfare and other use cases.

Technica's AI services include:

CUSTOM AI SOFTWARE & MODEL DEVELOPMENT

Full-cycle development of custom AI models based on Deep Learning (DL)/ML algorithms, including Data Science research, training, validation, testing.

AIOps

Comprehensive infrastructure management for ML workloads via Microservices Architecture (MSA) and containerization.

AI FOR THE EDGE

Machine Learning model customization for edge devices incorporating Size, Weight, and Power (SWaP) constraints and Denied-Disrupted, Intermittent, and Limited (D-DIL) communications environments.
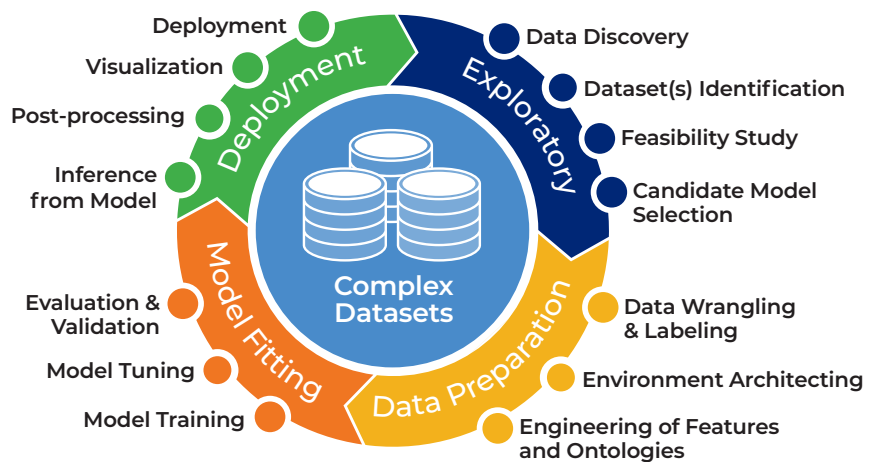
AI SOLUTIONS LIFECYCLE MANAGEMENT

Implementation of AI application lifecycle management and Continuous Integration (CI)/Continuous Delivery (CD), including working with Kubernetes.

AI-DRIVEN BIG DATA SOLUTIONS

Architecture design and implementation for Enterprise Big Data solutions like Apache Spark and Apache Kafka.

INTEGRATION

Establish integration with AI-ready cloud platforms and third-party APIs.

TECHNICA'S METHODOLOGY

Technica has developed an agile AI Methodology. The process allows us to move from ideation to prototyping in weeks – not years. Technica's AI Methodology enables us to conduct sprints within each element of the loop to demonstrate success, early and often. Beginning with your complex datasets, we iteratively move through each phase: Exploratory, Data Preparation, Model Fitting, and Deployment. As more data is collected, the process repeats.

Deployment
Visualization
Post-processing
Inference from Model

Data Discovery
Dataset(s) Identification
Feasibility Study
Candidate Model Selection

Exploratory

Deployment

Complex Datasets

Model Fitting

Data Preparation

Evaluation & Validation
Model Tuning
Model Training

Data Wrangling & Labeling
Environment Architecting
Engineering of Features and Ontologies

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AI SOFTWARE DEVELOPMENT STACK

Technica has real-world experience with the following:

DL Frameworks

- Tensorflow
- Theano
- PyTorch
- MXNet
- Nvidia Caffe
- Caffe2

Libraries

- Numpy/Scipy
- Scikit Learn
- Sonnet
- Tensorflow Probability
- Tensor2Tensor
- tf-slim

Modules/Toolkits

- Microsoft Cognitive Toolkit
- Natural Language Toolkit (NLTK)
- spaCy

Concepts

- Supervised/Unsupervised Learning
- Federated Learning
- Time Series Analysis
- Reinforcement Learning
- Representation Learning
- Genetic Algorithms to Hyper-tune Parameters
- Clustering (Density-Based, Hierarchical, Partitioning)

Neural Networks

- Transformer Attention, e.g., BERT
- Generative Adversarial Networks (GANs)
- Autoencoders
- Convolutional Neural Networks (CNNs)
- Recurrent Neural Networks (RNNs) including Long Short Term Memory (LSTM)
- Bayesian Networks

TECHNICA AI AREAS OF EXPERTISE

ML & DL

- Anomaly Detection for signals data, like network traffic data
- Natural Language Processing
- Ensuring autonomous resiliency and high-availability of microservices

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