



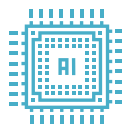
Full Stack Applied AI Syllabus





We are a **strategy and venture building firm** focused on the exponentiality of Decision Science, Artificial Intelligence, and Extended Reality.

We partner with the world's largest organizations to solve, develop, and scale robust solutions through meaningful innovation and with a hyper-focus on measurable impact.



We scale intelligence.

We scale both human and machine intelligence to deliver unprecedented value in our new age of knowledge.



We multiply value.

We look beyond linear growth and incremental improvements, and we're only satisfied with quantum leaps that compound its returns.



We elevate standards.

We lead, teach, and invest into people, process, and culture which allows us to deliver high-grade and sustainable solutions.



We co-build ventures.

Our results oriented culture focuses on delivering measurable impact resulting in venture building with real ROI.

WHAT DO WE DO?

ACCELERATED LEARNING

Modular, stackable learning curriculum built for real-world and modern AI applications.

TALENT & TEAM UPSKILLING

We transform individuals and teams to become agile AI practitioners.



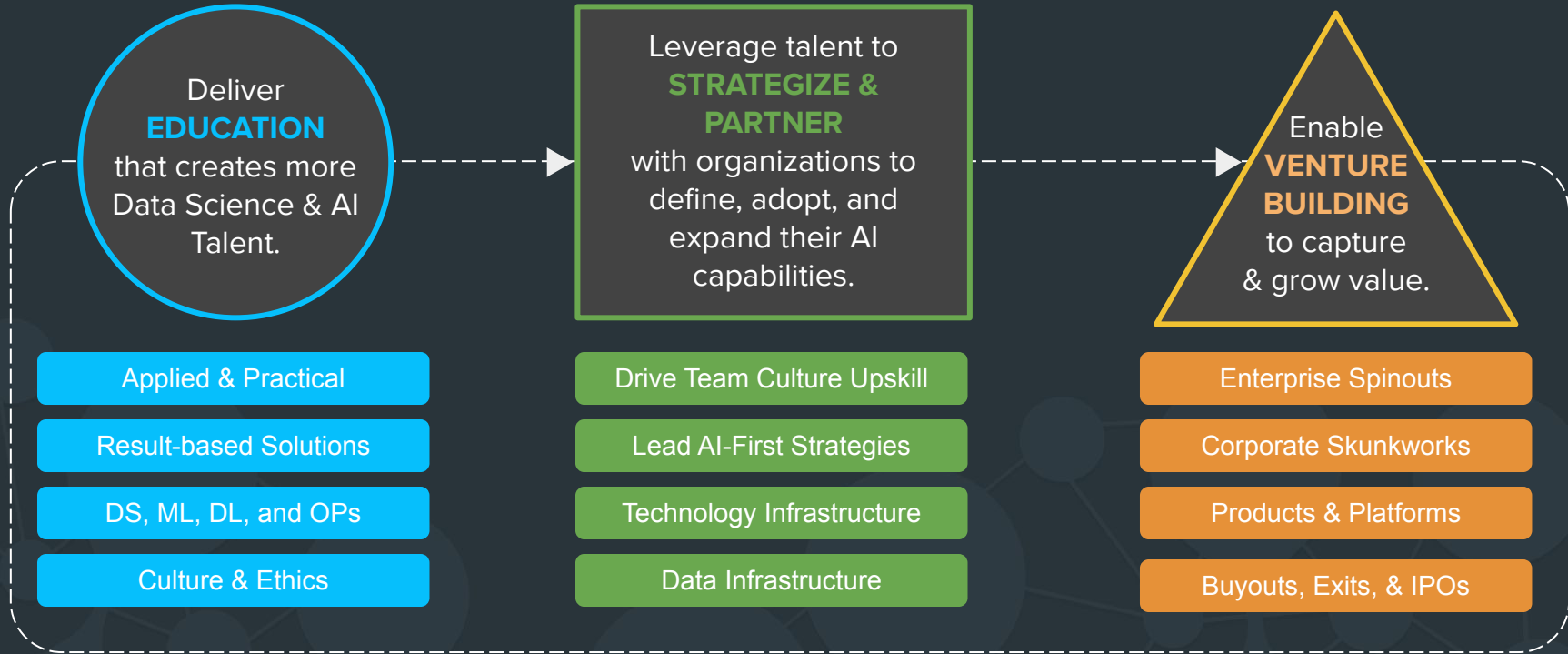
ENTERPRISE AI

We help organizations transform their teams, processes, and culture to adopt AI.

VENTURE & CO-CREATION

We identify tools, solutions, and teams to build new companies with enterprise partners.

WE'RE LEADING A VALUE-GENERATION ECOSYSTEM



THE AI STACK

1 Data Science for AI

Data analysis and visualizations with Python, hands on with data and data stores, and math primer (Statistics, Linear Algebra).

3 Applied Deep Learning

Introduction to Neural Networks (Fully connected, Convolutional, Recurrent), Overfitting & Generalization, Generative Models (incl. GAN), Reinforcement Learning, and Graph Convolutional Neural Networks.

5 AI in Production (ML Ops)

Practical Considerations & Tips, Deployment Methods, Machine Learning Lifecycle Management, Model Maintenance & Monitoring, Information Architecture for AI, Ethics, and Privacy & Security.

2 Applied Machine Learning

Machine Learning with Python, Supervised Learning (Regression, Classification), Unsupervised Learning (Clustering), Training & Evaluation of ML Models, Ensemble Learning, and tackling Overfitting & Generalization challenges.

4 Practical Topics in AI

Practical Natural Language Processing (NLP), Practical Machine Vision, Explainability & Visualization, Introduction to Knowledge Graphs

MODULAR, STACKABLE LEARNING

Our Full-Time and Part-Time courses are designed to be modular, enabling individuals and organizations to enroll in a full end-to-end certification program or be able to select key modules they prefer to engage in.

Class Size

20

We provide an intimate engagement between the instructors and the students.

Module Length

5 wks

Convenient course lengths to integrate your career and personal life.

Curriculum Length

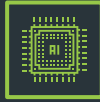
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Principles for data science, machine learning, and narrow AI in less than half a year.

MORE THAN THE SUM OF ITS PARTS

Applied AI

Students develop cutting-edge practical applications that companies use today.



Real Challenges

Engage in end-to-end solution lifecycle from concept to production reality.



By Industry Experts

Courses and projects designed and taught by real-world practitioners.



Live Instruction

Small class sizes and live instruction giving an interactive and engaging experience.



One-On-One Sessions

Schedule one-on-one sessions for answers to questions, project help, and coaching.



MODULE 1: DATA SCIENCE FOR AI

DATA ANALYSIS & VISUALIZATION WITH PYTHON

- ❖ Introduction to the relevant Python packages and their applications: (numpy, pandas, matplotlib, seaborn, and scipy)
- ❖ Introduction to Anaconda and Jupyter Notebook

WORKING WITH DATABASES

- ❖ Introduction to relational databases
- ❖ Learning how to write SQL queries
- ❖ Introduction to NoSQL databases
- ❖ Practicing with PostgreSQL and MongoDB

MATHEMATICS PRIMER

- ❖ Basics of applied linear algebra
- ❖ Introduction to linear algebra packages in Python
- ❖ Fundamentals of statistical inference and modeling
- ❖ Introduction to statsmodels packages in Python

COURSE PROJECT

- ❖ An end to end project to apply data cleaning, data analysis, and statistical inference methods on a real-world dataset.

MODULE 2: APPLIED MACHINE LEARNING

MACHINE LEARNING WITH PYTHON

- ❖ Demystifying Artificial Intelligence
- ❖ Introduction to Machine Learning
- ❖ Reviewing different types of Machine Learning
- ❖ Understanding Machine Learning lifecycle
- ❖ Introduction to ML package in Python (scikit-learn)

TRAINING & EVALUATION OF ML MODELS

- ❖ Understanding how ML models learn
- ❖ Interpreting learning curve
- ❖ Hyper-parameter optimization techniques
- ❖ Review of evaluation methods
- ❖ Model selection process
- ❖ Overfitting vs. underfitting
- ❖ Regularization techniques

SUPERVISED LEARNING

- ❖ Introduction to linear models
- ❖ Training linear regression model
- ❖ Optimization for regression
- ❖ Non-linear regression using polynomial models
- ❖ Classification using linear models
- ❖ Cross-entropy optimization
- ❖ Evaluation of classification models
- ❖ Multi-class classification methods
- ❖ Introduction to Support Vector Machine (SVM)

MODULE 2: APPLIED MACHINE LEARNING - continued

UNSUPERVISED LEARNING

- ❖ Unsupervised learning types and applications
- ❖ K-means clustering
- ❖ Evaluating clustering performance
- ❖ Hierarchical clustering
- ❖ DBScan clustering
- ❖ Data compression methods
- ❖ Principal Component Analysis (PCA)
- ❖ Visualization of high dimensional data
- ❖ Anomaly detection methods

ENSEMBLE LEARNING

- ❖ Training Decision Trees
- ❖ Introduction to ensemble learning methods (Bagging, Boosting, AdaBoost, Gradient Boosting, Stacking, Mixture of Experts)
- ❖ Introduction to Random Forest model
- ❖ Comparing RF with other ML models

COURSE PROJECT

- ❖ An end to end project to compare different ML models on a real-world dataset

MODULE 3: APPLIED DEEP LEARNING

INTRODUCTION TO NEURAL NETWORKS

- ❖ Understanding the need for complex non-linear models
- ❖ Introduction to fully-connected Artificial Neural Networks
- ❖ Introduction to Tensorflow/Keras framework
- ❖ Training Neural Networks
- ❖ Explaining backpropagation algorithm
- ❖ Choosing the right neural network architecture
- ❖ Understanding the regularization methods
- ❖ Reviewing the optimization methods
- ❖ Practical considerations while training Neural Networks

CONVOLUTIONAL NEURAL NETWORKS

- ❖ Introduction to image understanding
- ❖ Introduction to Convolutional Neural Networks (CNNs)
- ❖ Image Classification using CNNs
- ❖ Reviewing ImageNet CNN architectures
- ❖ Understanding transfer learning techniques
- ❖ Fine-tuning of ImageNet models
- ❖ Introduction to Batch Normalization
- ❖ Practical considerations while training CNNs

MODULE 3: APPLIED DEEP LEARNING - continued

RECURRENT NEURAL NETWORKS

- ❖ Understanding the need for sequential models
- ❖ Introduction to Recurrent Neural Networks (RNNs)
- ❖ Introduction to different types of RNN (i.g. GRU and LSTM)
- ❖ Sentence completion using RNN
- ❖ Challenges of training RNNs
- ❖ Seq2Seq & Transformer Architectures
- ❖ Practical considerations while training RNNs

GENERATIVE MODELS

- ❖ Introduction to generative models
- ❖ Understanding generative models vs. discriminative models
- ❖ Training Autoencoders
- ❖ Introduction to Representation
- ❖ Introduction to Variational AutoEncoders (VAEs)
- ❖ Generative Adversarial Models (GANs)
- ❖ Review different types of GANs

MODULE 3: APPLIED DEEP LEARNING - continued

REINFORCEMENT LEARNING

- ❖ Introduction to Reinforcement Learning
- ❖ Understanding exploitation vs exploration
- ❖ Simple Reinforcement Learning method (Q-learning)
- ❖ Training a toy example
- ❖ Deep Reinforcement Learning
- ❖ Introduction to policy gradient methods

GRAPH CONVOLUTIONAL NEURAL NETWORKS

- ❖ Introduction to Graphs
- ❖ Understanding the need for learning on Graph
- ❖ Review Graph Embedding methods
- ❖ Introduction to Graph Convolutional Neural Networks

COURSE PROJECT

- ❖ An end to end project to apply one of the neural network types on a real-world scenario use case and to compare different practical techniques learned in the class (e.g. regularization techniques)

MODULE 4: PRACTICAL TOPICS IN AI

PRACTICAL NATURAL LANGUAGE PROCESSING (NLP)

- ❖ Introduction to NLP
- ❖ Reviewing Python packages for NLP
- ❖ Text classification techniques
- ❖ Introduction to word embedding techniques
- ❖ Using RNNs for NLP Applications
- ❖ Reviewing machine translation methods
- ❖ How to build a dialog system
- ❖ Reviewing text generation methods
- ❖ Introduction to Natural Language Understanding
- ❖ Introduction to Speech Recognition and Generation

PRACTICAL MACHINE VISION

- ❖ Introduction to Machine Vision
- ❖ Reviewing machine vision applications
- ❖ Object detection methods
- ❖ Image segmentation techniques
- ❖ Realistic image generation using GAN
- ❖ Introduction to Super-resolution
- ❖ Image to Text and Text to Image techniques
- ❖ Introduction to AI Painter and style transfer
- ❖ Object tracking in videos
- ❖ Reviewing action detection methods
- ❖ Introduction to DeepFake

MODULE 4: PRACTICAL TOPICS IN AI - continued

EXPLAINABILITY & VISUALIZATION

- ❖ Understanding the need for explainability
- ❖ Reviewing explainability methods and tools
- ❖ Ensuring fairness in ML methods
- ❖ Understanding model safety and adversarial examples
- ❖ Understanding how Neural Networks work through Visualization

COURSE PROJECT

- ❖ A complete project to apply NLP or Machine Vision techniques to a real-world and complex problem



MODULE 5: AI IN PRODUCTION

AI STRATEGY

- ❖ Reviewing practical examples of AI in industry
- ❖ How and what problems to solve with AI
- ❖ Developing a data strategy for AI
- ❖ Develop an AI strategy

MLOPS

- ❖ Understanding deployment models
- ❖ Model monitoring
- ❖ Model maintenance
- ❖ Data architecture patterns for AI
- ❖ Tools and techniques available on cloud
- ❖ Reviewing cloud offerings from major cloud providers (i.e. AWS, Azure, and Google Cloud)

ML LIFECYCLE

- ❖ Machine Learning Lifecycle Management
- ❖ Model versioning and hyper-parameter storage
- ❖ Team collaboration in developing models
- ❖ Reviewing model evaluation strategies

OTHER CONSIDERATIONS

- ❖ Understanding privacy regulations
- ❖ Privacy considerations for AI
- ❖ Security considerations for AI solutions
- ❖ The role of ethics in AI in production

COURSE PROJECT

- ❖ Developing a complete AI solution for a real-world problem from strategy to production



Tuition Information

EDUCATION IS THE PASSPORT TO THE FUTURE

Important Parameters	Self-Study (e.g. Online Courses)	Traditional Path (e.g. Universities)	Accelerated (e.g. Bootcamps)
Time Investment	Very High	Very High	Low
Financial Investment	Low	Very High	Moderately High
Mentorship	None	Moderate	High
Employability	Low	High	High
Applied vs. Academic	Low on Both	Academic	Applied
AI vs. Data Science	Can be Both	Can be Both	Mostly Data Science
AI in Production (e.g. MLOps)	Not Many Resources	Very Low	Not Many Offerings
Practical Computer Vision / NLP	Hard to Follow	High but mostly Academic	Not Many Offerings

FIRST COHORT STARTING OCTOBER 5TH, 2020

Graduation & Final Project Presentations targeted for week of May 10th, 2021.

PER MODULE

Employer Sponsorship

Receive complete or partial tuition coverage from your company.

\$0 USD

per your employer's benefits

Per Module

** \$2,750 per module, save **\$250** by signing up for the Full STACK AI Program and paying upfront.

\$2,500 USD **

FULL STACK AI

Employer Sponsorship

Receive complete or partial tuition coverage from your company.

\$0 USD

per your employer's benefits

Full Tuition

** Save **\$1,250** on the full \$13,750 USD tuition by paying in full upfront.

\$12,500 USD **

Installment Plans

Divide tuition into installments for easy payments.

As low as

\$1,800 USD

per installment, conditions apply

Employer Sponsorship

To learn more about what your Employer can do, please contact us at learn@strata.ai

All Employer benefits vary.

Employee + Employer Partnership Approach

We work with both the individuals and company to align course projects and goals that address real-world internal company initiatives or objectives.



Strata.ai enables the Partnership

We first work with the organization to understand the current company objectives and challenges, identifying projects that the employee can develop while taking our training courses.



For the Employees

We customize course objectives to help the individual learn practical, real-world data science and machine learning development against current company initiatives defined. In which, a final project deliverable is due to the company.



For the Employers

The organization sponsors the Employee's tuition, which upskills their current team members and applies their institutional knowledge towards a final course project that benefits the company.

