AUTONOMOUS AI COURSERA Specialization

Course 1 Machine Teaching for Autonomous AI

Teaching enables AI to better acquire skills the same way that it builds skill in humans. This class is about using teaching principles to democratize AI and make it useful for real applications.

Together we will learn how TEACHING is the next era of intelligence. Things that learn need to be taught.

Course Outcomes: At the end of this course, learners will be able to...

1.1 Describe the concept Useful AI/machine teaching

1.2 Explain the role of teaching in training advanced AI

1.3 Evaluate the benefits & detriments of leveraging human expertise in design of AI systems

1.4 Make an impact

1.5 DIfferentiate between automated and autonomous decision making systems

1.6 Describe the limitations of automated systems and humans in real-time decision making

1.7 Select use cases where Autonomous AI will outperform both humans & automated systems

2.3 Validate your brain design against existing expertise & techniques for solving problems.

Course Grading	Points	Weight
Quiz 2.4: Math, Menus & Manuals	6 pts	10%
Milestone Assignment 1 : Identify a problem to solve	8 pts	10%
Quiz 3.3b: Applications for Automated & Autonomous Systems	6 pts	10%
Quiz 3.5: Human Factor: Evaluating autonomous AI scenarios	4 pts	10%
Milestone Assignment 2 : Look for human decision-making	8 pts	10%
Milestone Assignment 3 : Storytelling the Solution	10 pts	50%

Week 1
Introduction to Autonomous AI & Machine Teaching

Autonomous AI – The Big Picture

Introduction Videos
- 0.1 **Specialization Preview - A glimpse at what you'll learn**
- 0.2 **Who is this specialization for?**
- 0.3 **What will you encounter in this course?**
- 0.4 **The Instructional Team**

Readings
- **Course Glossary**
- **Course Resources**
- **Courser Map**

Discussion: **Introduce Yourself**

What is Useful AI?

Video 1.1 **Real Life Examples of Autonomous AI**

Reading 1.2 **Explore the Basics of Autonomous Systems**

Reading 1.3 **Your Mindset Profile**

Video 1.4 **The Teacher's Mindset**

Discussion: **Share Your Mindset**

Reading 1.5 **For Fun - Would you like to play a game?**

Week 2
Analyzing the Problem

Finding the Right Problems

Video 2.1 **The "Skills Gap"**

Video 2.1a **Autonomous AI in Action**
The invisible line on the balance sheet with NOV

Video 2.2 **The Value of the Problem**

Video 2.2a **Autonomous AI in Action**
The devastating effect of downtime with WOOD

Discussion: **The Skills Gap**

The Limitations of Automation

Video 2.3 **An Introduction to Math, Menus, & Manuals**

2.3a **Math -** Making Predictable Decisions with Control Theory

2.3b **Menus -** Searching for the Right Decision with Optimization Algorithms

2.3c **Manuals** - The Human Factor in Expert Rules and High-Stakes Decisions

Quiz 2.4: **Math, Menus, and Manuals**

Finding AI Solvable Problems

Video 2.5 **Interviewing Skills:** The Teacher's Toolset

Reading 2.6 **Structured Interview Questions**

Milestone 1: **Identify a Problem to Solve**
- Submit your assignment
- Complete 1 peer review

Week 3
Learning the Solution

Autonomous Systems

Video 3.1 **Machine Learning** - Algorithms that can learn

Video 3.1a **Autonomous AI in Action**
Curve fitting with WOOD

Video 3.2 **Deep Reinforcement Learning - Trial and error**

Video 3.3 **The Role of Strategy**

Quiz 3.3b **Applications for Automated and Autonomous Systems**

Machine Teaching: The next evolution in AI

Video 3.3 **Machine Teaching - Intelligence lives in the design**

Video 3.3a **Autonomous AI in Action**
Listening to Machines with NOV

Quiz 3.5 **The Human Factor: Evaluation autonomous AI scenarios**

Milestone 2: **Identify Autonomous AI Components to Use**
- Submit your assignment
- Complete 1 peer review

Week 4
Storytelling

The Value of Storytelling

Video 4.1 **The Value of Storytelling in Autonomous AI**

Video 4.1a **Autonomous AI in Action**
Building a Drone Laboratory at Bell Flight

Reading 4.2 **How to Structure Your Talk**

Discussion: **Persuasive Stories**

Writing Your Use-Case Story

Video 4.3a **Autonomous AI in Action**
A story of process improvement at PepsiCo

Video 4.3b **Autonomous AI in Action**
The internet of REALLY OLD things at NOV

Video 4.4 **Components of Storytelling**

Milestone 3: **Storytelling the Solution**
- Submit your assignment
- Complete 3 peer reviews

AUTONOMOUS AI COURSERA Specialization

Course 2 Designing Autonomous AI

This course is about how to combine the practicality of early AI expert knowledge systems with deep learning capabilities and industrial control technologies to design autonomous systems that can make robust decisions in the real world.

Course Outcomes

At the end of this course, students will be able to:

1.4 Make an impact

2.1 Interview subject matter experts to gather key requirement

2.2 Design a brain that will guide the exploration for learning a particular task

2.3 Validate your brain design against existing expertise and techniques for solving problems.

2.4 Produce a detailed specifications document so that someone can build your brain.

Course Grading — **Items** — **Points** — **Total**

FORMATIVE PRACTICE (Try It) — Course Weight ??

- Mastering Goal Types
- 3-Column Exercise
- Attaching goals to skills
- Narrow down skills/strategies
- Interpret a VIsual Design (or Specification Document)

ASSIGNMENTS — Course Weight ??%

- Course Project : Design a Brain

Preface 2.0.1: **Famous Autonomous AI**
Tesla AI [11/15/20; 54:09]
McKinsey: How AI helped Emirates Team New Zealand
AlphaGo
AlphaChess

Pepsi/Cheetos | BELL | McKinsey previews

Preface 2.0.2: **Scenarios**

- Scenarios as the context for understanding: actions, goals, skills and orchestration.
- Define: scenario, regime

Reading: **America's Cup Sailing**
Alpha Go
Alpha Zero
Full Self-Driving

Week 5
Actions

2.1.1: **Actions**

- Dedicated book chapter.

Ch 5 "Telling your AI brain what to do"

2.1.1A: **How Scenarios connect to Actions**

-

2.1.2: Course thread: **Maps Analogy (animation**)**

- Recall Math/Menus/Manuals as a form of map

Ch 3 "How decision-making works" "Acquiring skill is like exploring.." "A brain design is a mental map" Ch 1 "Solutions are like points on a map"

2.1.3: **Scenarios recap / Famous AI breakdown**

- **BELL AI & how it works**
- **Kence on whiteboard drawing it out.**

2.1.5 Project Milestone 1 : **Design a Brain – Add Actions**
Produce a detailed specifications document so that someone can build your brain.

??

Week 6
Goals

2.2.1: **What are the goals of the brain?**

- 6 Goal types
- Multiple goals
- Expert rules disguised as goals

Ch 6 "Setting goals for your AI brain"

2.2.1A: **How Scenarios connect to Goals**

-

2.2.2: **Mastering Goal Types**
Formative practice exercise

?? minutes

2.2.3: Course thread: **Maps Analogy (animation**)**

- A goal is a point on the solution map you are trying to reach.

Ch 3 "How decision-maing works" "Acquiring skill is like exploring.." "A brain design is a mental map" Ch 1 "Solutions are like points on a map"

2.2.4: **Scenarios recap / Famous AI breakdown**

- **KENCE BREAKS DOWN TESLA AI**

2.2.5: **Attaching goals to skills**
Formative practice exercise

?? minutes

2.2.6 Project Milestone 2 : **Design a Brain – Identify Goals**
Produce a detailed specifications document so that someone can build your brain.

??

Week 7
Skills

2.3.1: **Definitions**

- Concepts (Types of Concepts/Skills)
- Strategies
- Skills (Zone of proximal development?)

Ch 4 "Brains are built from skills"

2.3.1A: **How Skills are Mapped to Scenarios**

Sean, Pepsi/Cheetos: different perception and actions skills

2.3.2: **Types of Skills**

- Perception skills
- Action or Decision skills
- Selector skills
- ****ZOOM INTERVIEW W/ MINING CO.****

Ch 4 "Brains are built from skills"

2.3.3: **Heuristics/Strategies**

- 3-Columns Exercise
- Decide on core set of strategies

Bristow, BELL blackbox won't fly with FAA

Videos

2.3.4 Course thread: **Maps Analogy (animation**)**

- A skill is an action you take in relation to a landmark.

Ch 3 "How decision-maing works" "Acquiring skill is like exploring.." "A brain design is a mental map" Ch 1 "Solutions are like points on a map"

2.3.6A: **3-Column Exercise**
Formative practice exercise

?? minutes

2.3.6: **Narrow down skills/strategies**
Formative practice exercise

Delta Airlines, voice-over whiteboard

2.3.5: **Scenarios recap / Famous AI breakdown**

- McKinsey.

2.3.7 Project Milestone 3 : **Design a Brain – Add Skills**
Produce a detailed specifications document so that someone can build your brain.

??

Week 8
Orchestration

2.4.1: **Two paradigms for Orchestration**

- Functions: skills used in sequence or parallel [robotic arm example 11/15/20; 67:14]
- Strategies: skills that you trade-off against each other [Chess example 11/15/20; 63:57]

Ch 4 "Brains are organized by functions and strategies"

2.4.1b: How to read brain design diagrams

-

2.4.2: **The 3-steps of orchestration**

- Decompose your task into skills
- Arrange how your skills work together
- Choose a technology to perform each skill

Ch 7 "Steps to architect a brain"

2.4.3: **The 3-pitfalls of orchestration**

-

Ch 7 "Pitfalls to avoid when teaching skills"

2.4.3A: **Transforming Whiteboarding into AI**
Media Uploads: Project Bonsai-2 Simplify Building AI

2.4.4: Course thread: **Maps Analogy (animation**)**

- Orchestration provides sequence for using landmarks to navigate.

Ch 3 "How decision-maing works" "Acquiring skill is like exploring.." "A brain design is a mental map" Ch 1 "Solutions are like points on a map"

2.4.5: **Scenarios recap / Famous AI breakdown**

- **KENCE BREAKS DOWN ALPHA-GO & ALPHA-ZERO**

2.4.6: **Interpret a VIsual Design (or Specification Document)**
Formative practice exercise

?? minutes

2.4.7 Project Milestone 4 : **Design a Brain – Add Orchestration**
Produce a detailed specifications document so that someone can build your brain.

??

AUTONOMOUS AI COURSERA Specialization

Course 3 Revision Building Autonomous AI

This class will teach students how to build, test and deploy AI using the Microsoft Bonsai low code platform. This class includes hands on labs and optional hardware that can be used for machine teaching. A working knowledge of Python or a related language will be helpful for this course.

Pick one of the 5 example simulators; run it on the cloud ($). This will require some knowledge of cloud services, and nominal ($) fee.

Course Outcomes

At the end of this course, students will be able to:

3.1 Taking the structure of your brain design (C2 Course Project) and communicating to the platform the skills/strategies into the system.

3.2 Establish a simulated environment where your AI is going to practice.

3.3 Use an existing AI design and train the AI to complete the task

3.4 Validate and assess the AI's performance on the task

3.5 Make improvements to design and retrain AI

3.6 Deploy AI on a real piece of hardware

Course Grading — Items — Points — Total

FORMATIVE PRACTICE (Try It) — Course Weight ??

- Inkling Code Practice
- Balance a Ball
- Run a Simulator
- Assessing the Brain
- Prescriptive Modifications
- Opportunistic Modifications
- Assessing the Updated Brain
- Add Scenario of Lesson
- Assessing the Growing Brain

ASSIGNMENTS — Course Weight ??%

Course Project : Build a Brain

Preface 3.0.1: **Meet MOAB**

- Kence to provide high production B-roll**

B-Roll of MOAB device

Week 9
Design, meet Microsoft Project Bonsai.

3.1.1: **Big Picture: Translate 'Skills' to Concepts in using Project Bonsai**

- Compare to the structure of a human brain
- Guided tour of the Bonsai interface
- **INTERVIEW - CASE STUDY Building a Brain**

Generate – John

1 minute Project Bonsai video

3.1.2: **Skill – Action**

- Translate the skill action

PACKT Ch 3 "Programming the design of your intelligent system"

3.1.3: **Skill – Goal**

- Translate the skill goal(s)
- Reward function; a way to express goals

PACKT Ch 6 "Setting training goals and rewards for your intelligent system"

3.1.3A: **Lesson Plan as Practice Sequence for Scenarios**

3.1.4: **'Lesson' plan scenarios** (in Inkling called 'lessons')

- Map 'Lessons' to scenarios
- Explain how simulators emulate scenarios

PACKT 5 "Defining training scenarios for your intelligent system"; PACKT 7 "Training your intelligent ssystem"

Preface recap 3.1.5: **MOAB -- M.P. Bonsai**

-

3.1.6: **Inkling Code Practice** *?? minutes*

Formative practice: Explain the parts of the Inkling code and what it does. Train the brain for the first time.

?? minutes

AHA Moment

3.1.7: **Tutorial**

Formative practice: Login to Bonsai UI

?? minutes

3.1.8 Project : **Build a Brain – Visual Interface**

Building a brain that passes benchmarks

??

Week 10
Creating and training a brain

3.2.1: **Deconstructing the Problem: Lunar Lander AI Spec Review**

- Review the deconstructed problem
- you need more than one concept?
-

3.2.2: **Prescriptive modification**

Formative practice: Modify the brain to achieve a pre-determined goal (Avoid obstacle, or balance on a spot)

?? minutes

3.2.3: **Opportunistic modification**

Formative practice: Modify the brain to achieve a user-determined goal (Avoid obstacle, or balance on a spot)

?? minutes

3.4.1: **Updating Brains and version controls**

- Describe the maintenance and update requirements for a working brain.

PACKT Ch 10 "Maintaining your intelligent system"

3.1.1: **Big Picture: Translate 'Skills' to the drag-drop Bonsai interface using Visual Authoring**

3.1.1: **Translating a Moab AI Spec into a Bonsai brain**

- Compare to the structure of a human brain
- Guided tour of the Bonsai interface using
- **INTERVIEW - CASE STUDY Building a Brain**

Generate – John

1 minute Project Bonsai video

- n brain
- Guided tour of the Bonsai interface using
- **INTERVIEW - CASE STUDY Building a Brain**

Generate – John

1 minute Project Bonsai video

Week 11
Testing and Deploying Brain

3.3.1: **Chess Player Metaphor**

- Playing multiple games at once
- Interface to Bonsai
- Host in Cloud or locally
- SDK

Generate – John

3.3.2: **Assessing 'Skill' development**

- Explain using analogy of quizzes and tests
- Describe development as an iterative process

PACKT Ch 8 "Assessing & improving your intelligent system"

Sean, Pepsi 40 days of real-world trials

3.3.3: **Brain Transplants**

- Follow steps to export a brain.

PACKT Ch 9 "Deploying your intelligent system"; Content – John

Winston Jenks, deploying automated systems in factories

Preface recap 3.3.4: **MOAB -- Training**

-

?? minutes

3.3.5: **Assessing the Brain**

Formative practice: Write a quiz; (1) run a standard quiz (2) run your own test

?? minutes

3.3.6 Project : **Build a Brain**

Building a brain that passes benchmarks

??

Week 12
Simulators

3.4.1: **The Gym Metaphor**

- Defining, connecting, and validating your training environment
- Montage, training gyms for AI, based on simulator fotage.**
- **INTERVIEW - CASE STUDY AirSim simulator**

Gym metaphor content- John; PACKT Ch 4 "Establishing a simulation environment…"

WOOD, what's hard to simulate about real systems

3.4.2: **What is a Simulator?**

- What and Why
- Translate the skill action
- How it relates to Bonsai

Simulator Whitepaper content - Kence 5 minutes

3.4.3: **First-principles sim**

- Incorporated 3.2.2 What is a Simulator?
- Translate the skill action
- Discrete event sim

Simulator Whitepaper content - Kence 5 minutes

3.2.6: **How to Validate a Sim**

- Describe how to compare virtual world with reality
- Sim2Real gap

Existing Bonsai cookbook; content - John 3 minutes

Sean, Pepsi

3.4.4: **Data-driven sim**

Pepsi's data driven simulator

- Translate the skill goal(s)
- Checklist
- Offline RL
- Neural Sim (slow sim - explore)
- *Simulator Whitepaper content - Kence 8 minutes*

Preface recap 3.2.5: **MOAB -- Simulator**

- **BELL full-size training sim | Drone lab**

?? minutes

3.2.6: **Explore a Simulator**

Formative practice: Pick one of the 5 example simulators. Run it on the cloud ($)

?? minutes

3.2.9 Project : **Build a Brain**

Building a brain that passes benchmarks

??

Week 13
And Beyond

3.5.1: **New Scenarios & Lessons**

- Offer examples that illustrate the need for new Scenarios and Lessons.

PACKT Ch 10 "Maintaining your intelligent system"

Dale Erickson

3.5.2: **CASE STUDY:** ***Dale Erickson's Bonsai Brain***

3.5.2: **Add Scenario or Lesson**

Formative practice:

?? minutes

3.2.5: Translate the skill goal(s)

Simulator Whitepaper content - Kence 9 minutes

Preface recap 3.4.4: **MOAB -- Getting Smarter**

-

3.4.
Forr
(2) r

3.4.6 Project : **Build a Brain**

Building a brain that passes benchmarks

3.5.3: **Assessing the Growing Brain**

Formative practice: Write a quiz; (1) run a standard quiz (2) run your own test

?? minutes

3.5.4 Project : **Build a Brain**

Building a brain that passes benchmarks

??

AUTONOMOUS AI COURSERA Specialization

Course 4 Design Patterns for Autonomous AI

This course is a deeper dive into reusable design patterns for autonomous AI, built on a similar foundation as software engineering patterns.

Course Outcomes

At the end of this course, students will be able to:

- Understand all foundational design patterns
- Examine a problem and apply one or more design patterns to it
- Design an Autonomous AI from modular components
- Document AI designs

Project: analyze a famous AI by diagramming its architecture and design patterns and then modify or extending the AI by adding an additional design pattern

Course Grading — Items / Points / Total

FORMATIVE PRACTICE (Try It) — Course Weight ??

- Use a Selector
- Classify Brains
- Which Design Pattern is Applicable
- Honors Track - Redesign your own brain design from C2

ASSIGNMENTS — Course Weight ??%

- Course Project : Build a Brain

Preface 4.0.1: **Looking at Examples of Real AI**

- Teaser for the activities in C4.

?? minutes

Week 14
Advanced design concepts

4.1.1: **Skill acquisition model (Dreyfus)**

- Describe the five stages of the Skill Acquisition Model
- ****ZOOM INTERVIEW - Richard Dreyfus (or John B.)****

Ch 2 "How humans make decisions";
David Lawrence, the expert operator

4.1.2: **Teaching proficiency model**

- Teaching proficiency model
- Teaching proficiency as exemplified in increasingly sophisticated brains.

Ch 7 "Levels of teaching sophistication"; Ch7 "Levels of autonomous AI architecture"
Pepsi's V.1 -> V.2 transformation

4.1.3: **Brains with lots of strategies**

-

Ch 8 "Advanced machine teaching techniques

4.1.4: **Brains that discover new strategies**

- Describe how brains can naturally learn known strategies
- Describe how brains can discover new strategies. (EXAMPLES MIGHT SERVE AS TEASERS TO PLACE EARLIER IN THE SPECIALIZATION)

Ch 8 "Advanced machine teaching techniques

4.1.5: **Coordinated Agents**

- Explain analogy of players on a soccer team.

Ch 8 "Advanced machine teaching techniques

4.1.6: **Use a Selector**
Formative practice: Implement a Selector to enable the brain to choose a strategy.

?? minutes

Week 15
Design Patterns

4.2.1: **Patterns as Design Specification Short-hand**

- Describe the usefulness of 5-10 common design patterns
- (Analogous to music? E.g. 12-bar blues, 4 chords , knowing the common patterns makes playing music easier)

Generate content – Kence; Design patterns PPT
WOOD?? Many different projects??

4.2.2: **Perception pattern**

- Explain how to separate perception & action into different modules

Design patterns PPT
Pepsi's V.1 | BELL | NOV AI perception pattern

4.2.3: **Plan–Execute**

- Explain how one module plans, another
  autonomous racing)

Design patterns PPT;

4.2.3b: **Perceive-Plan-Execute**

- Explain how one module plans, another perceives, another module(s) execute. (e.g. cement making)

Design patterns PPT; Design patterns whitepaper
Pepsi's V.2 AI perception pattern

4.2.4: **Strategize–Execute**

- Explain how one module directs strategy, another module(s)
  execute (e.g. supermarket product place
  inventory optimization)

Design patterns PPT;

4.2.4b: **Perceive-Strategize-Execute**

- Explain how one module directs strategy, another perceives, another module(s) execute (e.g. supermarket product placement)

Design patterns PPT; Design patterns whitepaper

4.2.5: **Coarse tuning / fine tuning**

- Explain how one module brings the system into compliance, the other optimizes production.

Design patterns PPT
Pepsi's V.2 AI fine-tuning pattern

4.2.6: **Classify brains**
Formative practice:

?? minutes

4.2.7: **Quiz: which design pattern is applicable**
Formative practice:

?? minutes

4.2.8 Project : **Analyze a Brain for improvement**
Analyze a famous AI by diagramming its architecture and design patterns and then modify or extending the AI by adding an additional design pattern

??

Week 16
Brain Design Patterns in Action

4.3.1: **How Real AI uses Patterns**

- Revist a select set of Real A.I an show which patterns applied.

Generate content – Kence
Pepsi | BELL | NOV

4.3.2 Project : **Analyze a Brain for improvement**
Analyze a famous AI by diagramming its architecture and design patterns and then modify or extending the AI by adding an additional design pattern

??

Week 17
Call to Action (Make an Impact)

4.4.1: **Human / Brain collaborations**

- Sherlock Holmes (Cumberbatch) metaphor
- East Oakland chess club; learning accelerated through teaching AI chess, as well as practicing with AI.

Generate content – Kence
Microsoft HVAC AI
Microsoft's AI work with non-profits

4.4.2: Honors track: **Redesign your own brain design from C2**
Formative practice:

?? minutes

AUTONOMOUS AI COURSERA Specialization
Course 3 Building Autonomous AI

This class will teach students how to build, test and deploy AI using the Microsoft Bonsai low code platform. This class includes hands on labs and optional hardware that can be used for machine teaching. A working knowledge of Python or a related language will be helpful for this course.

Pick one of the 5 example simulators; run it on the cloud ($). This will require some knowledge of cloud services, and nominal ($) fee.

Course Outcomes

At the end of this course, students will be able to:

3.1 Taking the structure of your brain design (C2 Course Project) and communicating to the platform the skills/strategies into the system.

3.2 Establish a simulated environment where your AI is going to practice.

3.3 Use an existing AI design and train the AI to complete the task

3.4 Validate and assess the AI's performance on the task

3.5 Make improvements to design and retrain AI

3.6 Deploy AI on a real piece of hardware

Course Grading

FORMATIVE PRACTICE (Try It)

- Inkling Code Practice
- Balance a Ball
- Run a Simulator
- Assessing the Brain
- Prescriptive Modifications
- Opportunistic Modifications
- Assessing the Updated Brain
- Add Scenario of Lesson

Preface 3.0.1: **Meet MOAB**

- Kence to provide high production B-roll**

B-Roll of MOAB device

Week 9
Design, meet Microsoft Project Bonsai.

3.1.1: **Big Picture: Translate 'Skills' to the drag-drop Bonsai interface**

- Compare to the structure of a human brain
- Guided tour of the Bonsai interface
- ****INTERVIEW - CASE STUDY Building a Brain****

Generate – John

1 minute Project Bonsai video

3.1.2: **Skill – Action**

- Translate the skill action

PACKT Ch 3 "Programming the design of your intelligent system"

3.1.3A: **Lesson Plan as Practice Sequence for Scenarios**

3.1.3: **Skill – Training**

- Reward function; a way to express goals

PACKT Ch 6 "Setting training goals and rewards for your intelligent system"

3.1.4: '**Lesson' plan scenarios** (in Inkling called 'lessons')

- Map 'Lessons' to scenarios
- Explain how simulators emulate scenarios

PACKT 5 "Defining training scenarios for your intelligent system"; PACKT 7 "Training your intelligent ssystem"

Preface recap 3.1.5: **MOAB -- M.P. Bonsai**

-

3.1.6: **Inkling Code Practice** *?? minutes*
Formative practice: Explain the parts of the Inkling code and what it does. Train the brain for the first time.
?? minutes

3.1.7: **Balance a Ball**
Formative practice: Login to Bonsai UI
?? minutes

AHA Moment

3.1.8 Project : **Build a Brain – Visual Interface**
Building a brain that passes benchmarks
??

Week 10
Simulators

3.2.1: **The Gym Metaphor**

- Defining, connecting, and validating your training environment
- Montage, training gyms for AI, based on simulator footage.**
- ****INTERVIEW - CASE STUDY AirSim simulator****

Gym metaphor content- John; PACKT Ch 4 "Establishing a simulation environment…"

WOOD, what's hard to simulate about real systems

3.2.3: **First-principles sim**

- Incorporated 3.2.2 What is a Simulator?
- Translate the skill action

Simulator Whitepaper content - Kence 5 minutes

3.2.4: **Data-driven sim**

- Translate the skill goal(s)

Simulator Whitepaper content - Kence 8 minutes

Pepsi's data driven simulator

3.2.5: **Discrete event sim**

- Translate the skill goal(s)

Simulator Whitepaper content - Kence 9 minutes

3.2.6: **How to Validate a Sim**

- Describe how to compare virtual world with reality

Existing Bonsai cookbook; content - John 3 minutes

Sean, Pepsi

Preface recap 3.2.7: **MOAB -- Simulator**

- **BELL full-size training sim | Drone lab**

?? minutes

3.2.8: **Run a Simulator**
Formative practice: Pick one of the 5 example simulators. Run it on the cloud ($)
?? minutes

3.2.9 Project : **Build a Brain**
Building a brain that passes benchmarks
??

Week 11
Testing a Brain

3.3.1: **Chess Player Metaphor**

- Playing multiple games at once
- Interface to Bonsai
- Host in Cloud or locally
- SDK

Generate – John

3.3.2: **Assessing 'Skill' development**

- Explain using analogy of quizzes and tests
- Describe development as an iterative process

PACKT Ch 8 "Assessing & improving your intelligent system"

Sean, Pepsi 40 days of real-world trials

3.3.3: **Brain Transplants**

- Follow steps to export a brain.

PACKT Ch 9 "Deploying your intelligent system"; Content – John

Winston Jenks, deploying automated systems in factories

Preface recap 3.3.4: **MOAB -- Training**

-

?? minutes

3.3.5: **Assessing the Brain**
Formative practice: Write a quiz; (1) run a standard quiz (2) run your own test
?? minutes

3.3.6 Project : **Build a Brain**
Building a brain that passes benchmarks
??

Week 12
Modifying a Brain

3.4.1: **Updating Brains and version controls**

- Describe the maintenance and update requirements for a working brain.

PACKT Ch 10 "Maintaining your intelligent system"

3.4.2: **Prescriptive modification**
Formative practice: Modify the brain to achieve a pre-determined goal (Avoid obstacle, or balance on a spot)
?? minutes

3.4.3: **Opportunistic modification**
Formative practice: Modify the brain to achieve a user-determined goal (Avoid obstacle, or balance on a spot)
?? minutes

Preface recap 3.4.4: **MOAB -- Getting Smarter**

-

?? minutes

3.4.5: **Assessing the Updated Brain**
Formative practice: Write a quiz; (1) run a standard quiz (2) run your own test
?? minutes

3.4.6 Project : **Build a Brain**
Building a brain that passes benchmarks
??

Week 13
And Beyond

3.5.1: **New Scenarios & Lessons**

- Offer examples that illustrate the need for new Scenarios and Lessons.

PACKT Ch 10 "Maintaining your intelligent system"

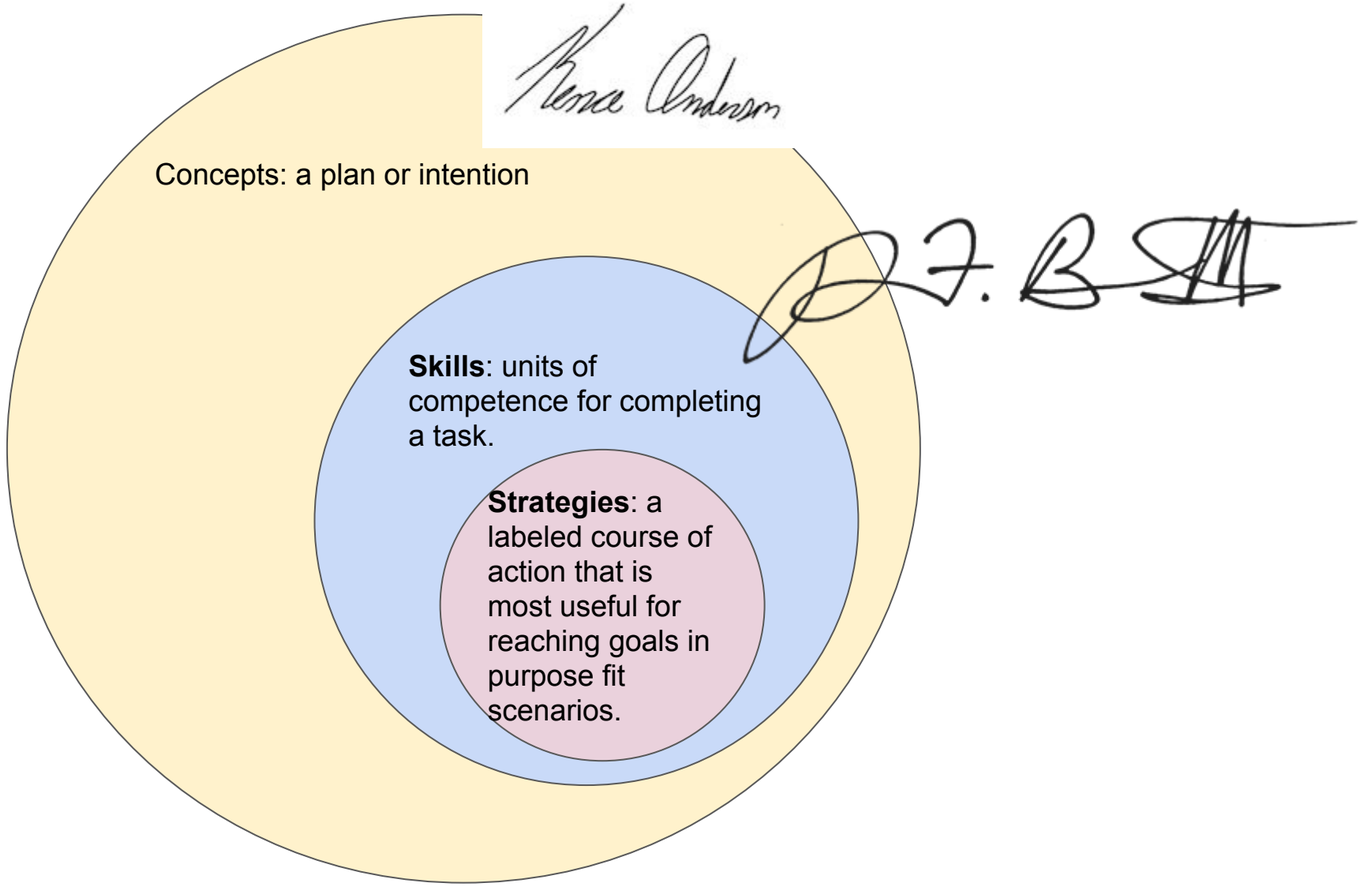
Dale Erickson

3.5.2: **CASE STUDY:** ***Dale Erickson's Bonsai Brain***

3.5.2: **Add Scenario or Lesson**
Formative practice:
?? minutes

3.5.3: **Assessing the Growing Brain**
Formative practice: Write a quiz; (1) run a standard quiz (2) run your own test
?? minutes

3.5.4 Project : **Build a Brain**
Building a brain that passes benchmarks
??


Concepts: a plan or intention
Skills: units of competence for completing a task.
Strategies: a labeled course of action that is most useful for reaching goals in purpose fit scenarios.