AI Product Manager Nanodegree Program

Learn how to build AI products that deliver business value

Program Overview

This ultimate goal of the AI Product Manager Nanodegree program is to help students learn the unique skills that define the success of a machine learning product. Students will learn how to identify business cases that can benefit from AI technologies, and implement best practices for designing datasets and product prototypes.

A graduate of this program will be able to:

- Decide to use an unsupervised, supervised, or deep learning model when approaching a specific problem.
- Design a data annotation job to create a novel dataset.
- Build predictive models using automated machine learning tools.
- Compare the performances of learned models using suitable metrics.
- Prototype, test, and iterate on an AI product.

This program is comprised of 4 courses and 3 projects. Each project you build will be an opportunity to demonstrate what you've learned in the lessons. **Your completed projects will become part of a career portfolio that will demonstrate to potential employers that you have skills in product management, design principles, and training and evaluating machine learning models.**

Estimated Length of Program: 2.5 months
Frequency of Classes: Self-paced

Projects Overview

One of our main goals at Udacity is to help you **create a job-ready portfolio of completed projects**. Building a project is one of the best ways to test the skills you've acquired and to demonstrate your newfound abilities to future employers or colleagues. Throughout this Nanodegree program, you'll have the opportunity to prove your skills by building the following projects:

- **Create a Medical Image Annotation Job**

- Design a labeled dataset that distinguishes between x-ray images that indicate health or pneumonia in lungs; this can be used by ML engineers later on down the line to build a diagnostic product.
- **Build a Model with Google AutoML**
  - Build a variety of different medical image classification models using Google Cloud AutoML. You'll have the opportunity to observe how properties of the data impact the models' results.
- **Create an AI Product Business Proposal**
  - Put together all that you've learned to submit a final proposal for an AI product that considers users, design practices, and the type of machine learning model you might use in the product.

In the sections below, you'll find detailed descriptions of each project along with the course material that presents the skills required to complete the project.

Introduction to AI

AI enables innovation by automating tasks that were previously repetitive, and time-consuming. Today, it seems like every business either depends fundamentally on the capabilities of AI, or seeks to rapidly upskill its workforce to compete in the new, AI world. Learn the foundations of AI and machine learning, starting with the unsupervised and supervised models that are used in industry today. Understand how to develop a clear, narrow business case for an AI application. Learn how and *when* to use AI in a product based on business metrics and data availability.

Supporting Lesson Content: AI in Business

Lesson Title	Learning Outcomes
Introduction to AI and Machine Learning	➔ Learn the basics of AI and machine learning, and how businesses derive value from AI ➔ Understand the meaning of key terminologies, such as supervised learning, unsupervised learning, and neural networks
Using AI and ML in Business	➔ Learn to narrow down a business use case and decide when to use AI in a product ➔ Learn strategies for measuring the success of a product ➔ See how to build an AI product team that can manage data and test product efficacy, over time

Project: Create a Medical Image Annotation Job

Training data is the currency of AI—no model will perform successfully with poor quality input data. Learn how to develop a relevant, complete, unique and high-quality dataset. Learn how to use Figure Eight's data annotation platform to develop a labeled dataset for supervised learning. Understand how to anticipate data failures and plan for longevity.

Learn how to create a novel dataset, by designing a data annotation job. In this medical image annotation project, your goal, as a product owner is to build a product that helps doctors quickly identify cases of pneumonia in children. You'll want to build a classification system that can help flag serious cases of pneumonia and act as a diagnostic aid for doctors. Your main task will be to create a data labeling job using [Figure Eight's platform](https://www.figure-eight.com/platform/).

Supporting Lesson Content: Create a Dataset

Lesson Title	Learning Outcomes
Data Fit & Annotation	➔ Learn to analyze the size of your data and how well data fits a particular product use case ➔ Learn how to use Figure Eight's crowdsourced data annotation platform to generate a high-quality ground-truth dataset with human annotation ➔ Design annotation instructions for best-in-class results
Project: Medical Image Annotation	➔ Define a product goal for a medical diagnostic tool ➔ Design an annotation job for a medical image dataset ➔ Consider metrics for success, how you might improve the annotation design, and design test questions for annotators

Project: Build a Model with Google AutoML

AI products rely upon machine learning models at their core. Understand key fundamentals of AI models including how neural networks produce decisions and how "training" works. Understand how training data affect the performance of a model, and how to evaluate models' results. Learn how transfer learning and neural architecture search make AI available to a wide variety of users.

In this project, get experience building models using automated ML, from data to results (no coding required). Build your own model using Google AutoML for a medical imaging use case. Then, implement the model with four different variants of the data in order to appreciate how the data affect the performance of the model.

Supporting Lesson Content: Build a Model

Lesson Title	Learning Outcomes
Training and Evaluating a Model	➔ Learn how a neural network learns from training data ➔ Use test data to evaluate a trained model according to metrics like accuracy, precision, and recall ➔ Learn how to use pre-trained models to transfer learning from one resource to another

| Project: Build a Model | ➔ Build and train a model using Google's AutoML |
| | ➔ Evaluate several models and decide on the best model for a given product use case |

Project: Capstone Proposal

AI models are only as valuable as their impact on your business. Learn how to measure post-deployment impact, and how to make data-informed improvements with A/B testing and versioning. Ensure that your model continuously improves via active learning. Understand how to avoid major failures due to unwanted bias, and how to ensure data security and compliance in different geographies. When you finally have product-market fit, learn to plan for the future and scale your product.

In the capstone project, you will develop a business proposal for an AI product for a use case of your choosing. You'll develop a business case for the product, define success metrics, scope the dataset, plan the model development, and build a post-deployment monitoring plan. Reviewers will evaluate your proposal for rigor and completeness.

Supporting Lesson Content: Measuring Impact and Updating Models

Lesson Title	Learning Outcomes
Measuring Business Impact & Mitigating Bias	➔ Learn how to measure the business outcomes of a launched product
	➔ Discuss A/B testing and versioning
	➔ Learn strategies for mitigating unwanted bias in a machine learning model and product
	➔ See how to scale a product, according to user audience and demand
Case Study: Video Annotation	➔ See an end-to-end AI product development cycle
	➔ Learn strategies for ideating solutions to problems, and improving a prototype, incrementally
	➔ Spend your time focused on prototyping a product, and learn strategies for continuously learning and updating a machine learning model
Project: Capstone Proposal	➔ Develop a business proposal for an AI product