Structuring Machine Learning Projects

by DeepLearning.AI

About this Course
In the third course of the Deep Learning Specialization, you will learn how to build a successful machine learning project and get to practice decision-making as a machine learning project leader.

By the end, you will be able to diagnose errors in a machine learning system; prioritize strategies for reducing errors; understand complex ML settings, such as mismatched training/test sets, and comparing to and/or surpassing human-level performance; and apply end-to-end learning, transfer learning, and multi-task learning.

This is also a standalone course for learners who have basic machine learning knowledge. This course draws on Andrew Ng's experience building and shipping many deep learning products. If you aspire to become a technical leader who can set the direction for an AI team, this course provides the "industry experience" that you might otherwise get only after years of ML work experience.

The Deep Learning Specialization is our foundational program that will help you understand the capabilities, challenges, and consequences of deep learning and prepare you to participate in the development of leading-edge AI technology. It provides a pathway for you to gain the knowledge and skills to apply machine learning to your work, level up your technical career, and take the definitive step in the world of AI.

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Taught by: **Andrew Ng**, Instructor
Founder, DeepLearning.AI & Co-founder, Coursera

Taught by: **Younes Bensouda Mourri**, Curriculum developer
Computer Science

Taught by: **Kian Katanforoosh**, Senior Curriculum Developer
Founder, Workera

Basic Info	Course 3 of 5 in the Deep Learning Specialization
Level	Beginner
Commitment	At the rate of 5 hours a week, it typically takes 4 weeks to complete this course
Language	English, **Subtitles:** Chinese (Traditional), Arabic, French, Bengali, Ukrainian, Chinese (Simplified), Greek, Italian, Portuguese (Brazil), Vietnamese, Dutch, Korean, German, Pashto, Urdu, Russian, Thai, Indonesian, Swedish, Turkish, Azerbaijani, Spanish, Dari, Hindi, Japanese, Kazakh, Hungarian, Polish
Hardware Req	None currently, unless you'd like to download Jupyter Notebooks locally for offline work.
How To Pass	Pass all graded assignments to complete the course.
User Ratings	Average User Rating 4.8

Syllabus

Week 1

ML Strategy

Streamline and optimize your ML production workflow by implementing strategic guidelines for goal-setting and applying human-level performance to help define key priorities.

13 videos, 3 readings

1. **Video:** Why ML Strategy
2. **Video:** Orthogonalization
3. **Reading:** [IMPORTANT] Have questions, issues or ideas? Join our Forum!
4. **Video:** Single Number Evaluation Metric
5. **Video:** Satisficing and Optimizing Metric
6. **Video:** Train/Dev/Test Distributions
7. **Video:** Size of the Dev and Test Sets
8. **Video:** When to Change Dev/Test Sets and Metrics?
9. **Video:** Why Human-level Performance?
10. **Video:** Avoidable Bias
11. **Video:** Understanding Human-level Performance
12. **Video:** Surpassing Human-level Performance
13. **Video:** Improving your Model Performance
14. **Reading:** Lecture Notes W1
15. **Reading:** Machine Learning Flight Simulator (Introduction to the Quizzes)
16. **Video:** Andrej Karpathy Interview

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Graded: Bird Recognition in the City of Peacetopia (Quiz Case Study)

Week 2

ML Strategy

Develop time-saving error analysis procedures to evaluate the most worthwhile options to pursue and gain intuition for how to split your data and when to use multi-task, transfer, and end-to-end deep learning.

11 videos, 2 readings

1. **Video:** Carrying Out Error Analysis
2. **Video:** Cleaning Up Incorrectly Labeled Data
3. **Video:** Build your First System Quickly, then Iterate
4. **Video:** Training and Testing on Different Distributions
5. **Video:** Bias and Variance with Mismatched Data Distributions
6. **Video:** Addressing Data Mismatch
7. **Video:** Transfer Learning
8. **Video:** Multi-task Learning
9. **Video:** What is End-to-end Deep Learning?
10. **Video:** Whether to use End-to-end Deep Learning
11. **Reading:** Lecture Notes W2
12. **Video:** Ruslan Salakhutdinov Interview
13. **Reading:** Acknowledgments

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Graded: Autonomous Driving (Quiz Case Study)

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How It Works

General

How do I pass?

To earn your Certificate, you'll need to earn a passing

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Course 3 of Specialization

Become a Machine Learning expert
Master the fundamentals of deep learning and break into AI. Recently updated with cutting-edge techniques!

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Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization
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