## Deep Learning with MATLAB

### Prerequisites

**MATLAB Fundamentals**  
**Deep Learning Onramp**

<table>
<thead>
<tr>
<th>Day 1 of 2</th>
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<tbody>
<tr>
<td><strong>Transfer Learning for Image Classification</strong></td>
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<tr>
<td><strong>Objective:</strong> Perform image classification using pretrained networks. Use transfer learning to train customized classification networks.</td>
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</table>
| - Pretrained networks  
- Image datastores  
- Transfer learning  
- Network evaluation |
| **Interpreting Network Behavior** |
| **Objective:** Gain insight into how a network is operating by visualizing image data as it passes through the network. Apply this technique to different kinds of images. |
| - Activations  
- Feature extraction for machine learning |
| **Creating Networks** |
| **Objective:** Build convolutional networks from scratch. Understand how information is passed between network layers and how different types of layers work. |
| - Training from scratch  
- Neural networks  
- Convolution layers and filters |
| **Training a Network** |
| **Objective:** Understand how training algorithms work. Set training options to monitor and control training. |
| - Network training  
- Training progress plots  
- Validation |

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<thead>
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<th>Day 2 of 2</th>
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<tr>
<td><strong>Improving Network Performance</strong></td>
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<td><strong>Objective:</strong> Choose and implement modifications to training algorithm options, network architecture, or training data to improve network performance.</td>
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| - Training options  
- Directed acyclic graphs  
- Augmented datastores |
| **Performing Image Regression** | **Objective:** Create convolutional networks that can predict continuous numeric responses.  
- Transfer learning for regression  
- Evaluation metrics for regression networks |
| **Using Deep Learning for Computer Vision** | **Objective:** Train networks to locate and label specific objects within images.  
- Image application workflow  
- Object detection |
| **Classifying Sequence Data** | **Objective:** Build and train networks to perform classification on ordered sequences of data, such as time series or sensor data.  
- Long short-term memory networks  
- Sequence classification  
- Sequence preprocessing  
- Categorical sequences |
| **Generating Sequences of Output** | **Objective:** Use recurrent networks to create sequences of predictions.  
- Sequence to sequence classification  
- Sequence forecasting |