

Advanced Computer Vision with TensorFlow

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Presented By

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Course Information:



Platform: Coursera (DeepLearning.AI)



Duration: 4 weeks / 17 hours



Instructors: Laurence Moroney, Eddy Shyu



Focus: Object detection, segmentation, interpretability

Key Concepts

Tasks

- Image Classification
- Object Detection
- Segmentation (Semantic / Instance)

Architecture

- R-CNN family
- Mask R-CNN
- ResNet-50
- U-Net

Methods

- Region Proposal Networks (RPN)
- Encoder-Decoder
- Attention mechanisms



AI Techniques

Core

CNNs for spatial feature extraction

Training

Transfer learning (ImageNet), Data augmentation,
Multi-task learning

Optimization

End-to-end training with custom loss functions



Applications of AI

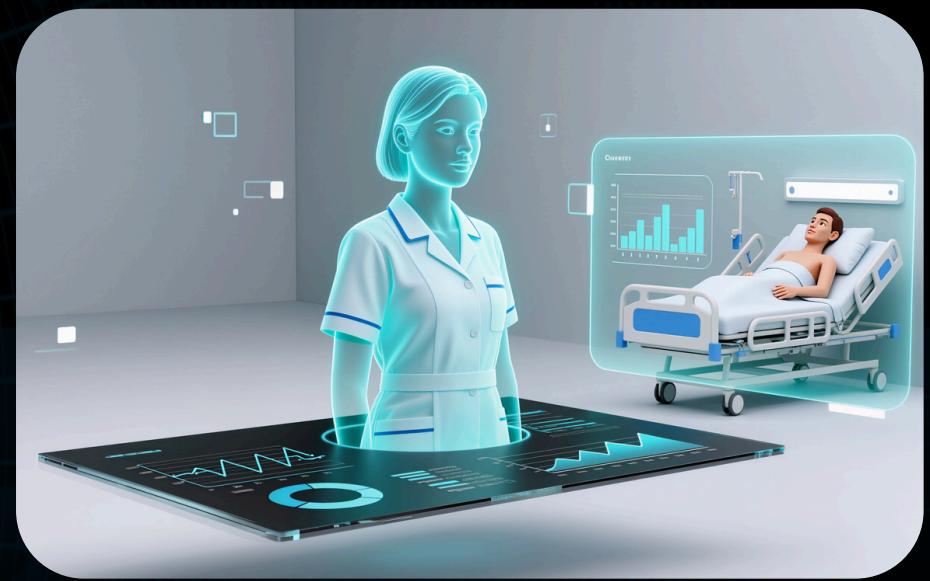
Autonomous Vehicles: Real-time pedestrian detection



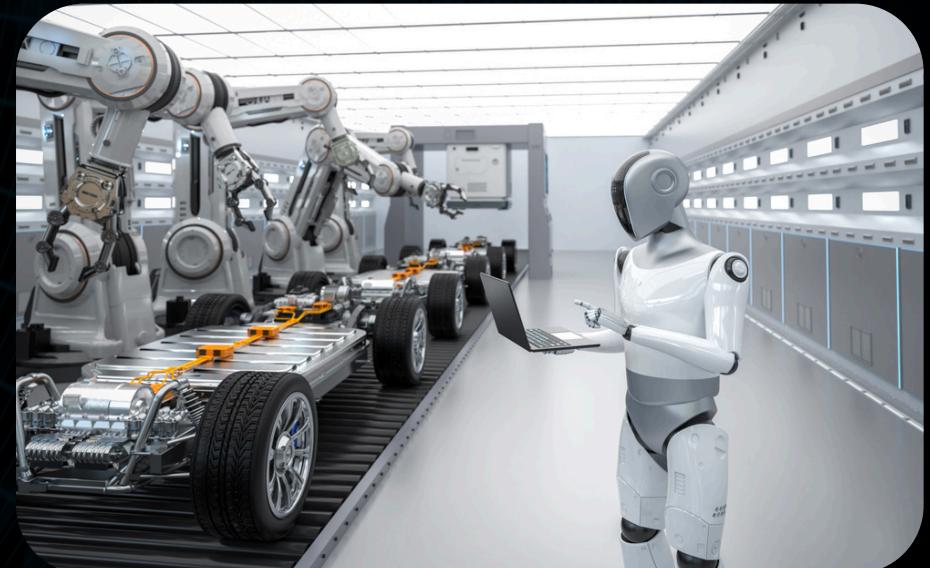
Security: Face recognition & crowd analysis



Healthcare: Tumor detection & organ segmentation



Manufacturing: Quality control & defect detection



Critical Reflection

Strengths:

- 01** Practical TensorFlow implementation with real datasets
- 02** Strong model interpretability focus

Weaknesses:

- 01** Assumes strong TensorFlow background - challenging start
- 02** Limited deployment coverage

IT426 Connection:

- 01** IT426 intelligent agents → Visual understanding systems
- 02** Search & optimization → Neural network training



Personal & Group Takeaway

 Rama

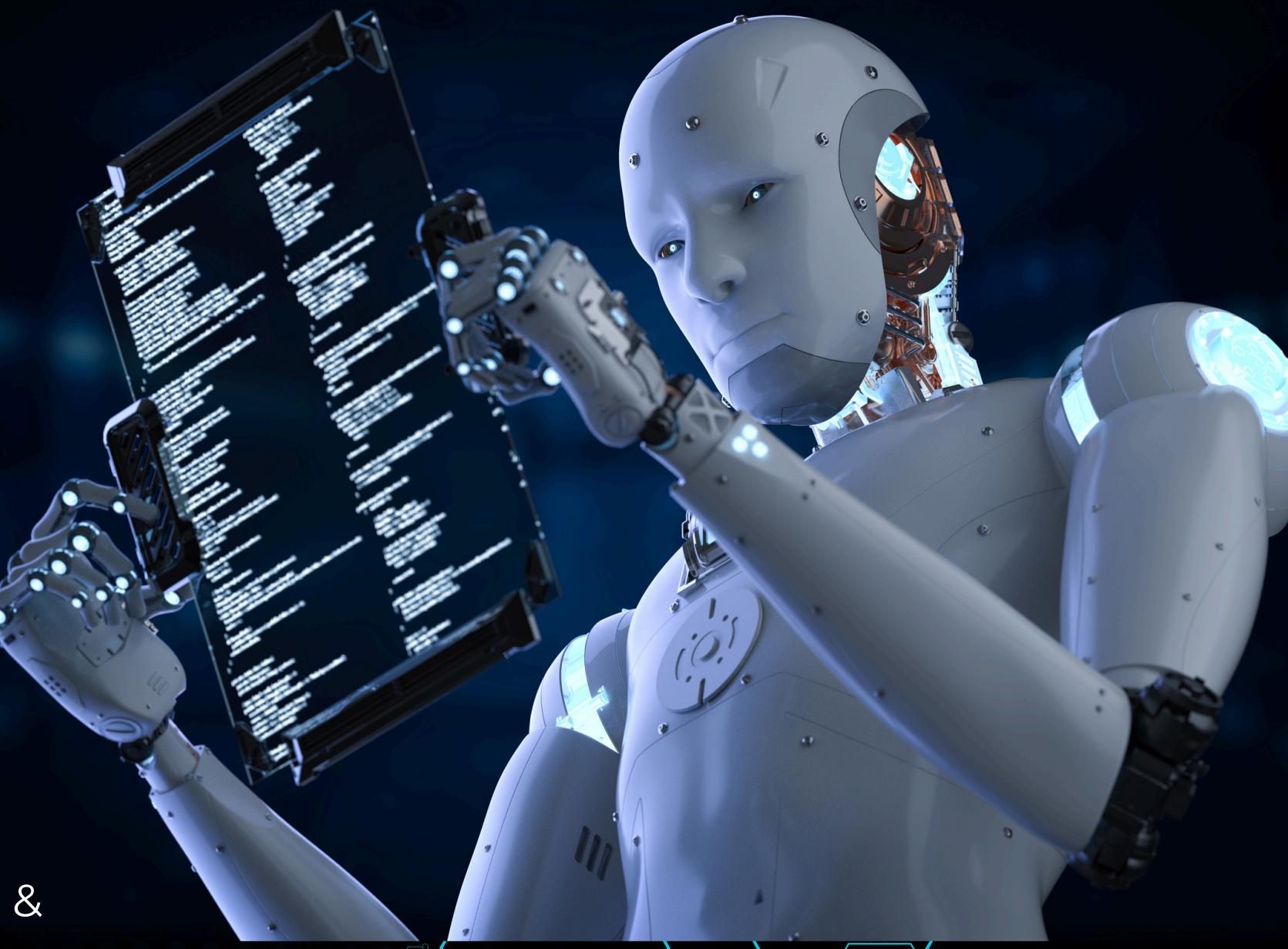
Pursuing computer vision in healthcare & medical imaging

 Rima

Specializing in autonomous systems & robotics

 Walaa

Exploring entrepreneurial opportunities in agriculture & manufacturing



Thank You

Any Question?

