

# AI: Strategy + Marketing (MGT 853)

## Zebra Medical Vision: AI in Radiology (Session 6)

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Spring 2025

# Pop Quiz (Not graded!)

# Q1

- You're working with an online retailer who has browsing and purchase data for users. They would like you to identify which consumers have been most responsive to their messaging promotions over the past year. Which of the following approaches could be helpful here?
  - ① Unsupervised
  - ② Supervised
  - ③ Reinforcement

## Q2

- Which of these is an example of reducing model complexity?
  - ➊ Deciding not to use certain features  $X$  in a prediction problem
  - ➋ Including interaction terms 
$$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 X_2$$
  - ➌ Dropping out neurons in a neural network
  - ➍ Penalizing models that have too many parameters

# Q3

- Which of the following weather related problems would Unsupervised Learning **\*not\*** be suitable for?
  - ① Identify features for inclusion in prediction problems
  - ② Predict tomorrow's weather
  - ③ Determine which cities have similar weather patterns
  - ④ Discover a rule like "If it has rained today, and it is sunny now, we're likely to see a rainbow"

## Q4

- Suppose we're predicting prices for cars based on visual features using images, in addition to characteristics like mpg, hp etc. You have annual data from 2010-2014. You split the data into training and test samples to predict prices and use Deep Learning to predict sales prices. Which options below are correct?
  - 1 Data splitting is not helpful because we are not leveraging all the data
  - 2 Data splitting is a good practice because of model complexity
  - 3 Data splitting is helpful because prediction on test data provides the best estimate
  - 4 There is data leakage when we split the data by years

# Guest Speaker and Course Dates

# Zebra Medical Vision Case

# Questions to Explore

- ① Where does Zebra fit into the healthcare ecosystem?
- ② What does value creation look like with AI?
- ③ What is the ML problem?
- ④ How should Zebra position the product?

# Zebra Exhibits

# Deep Net Models for Image Data

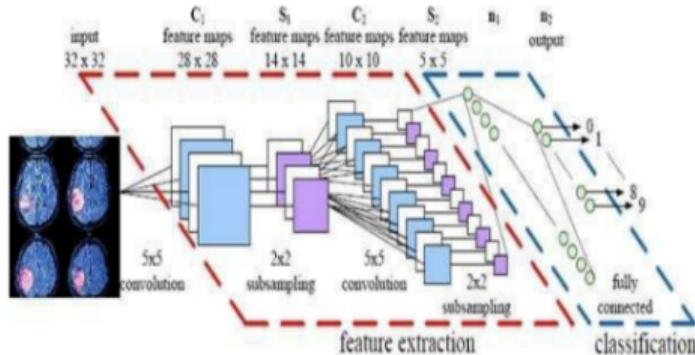
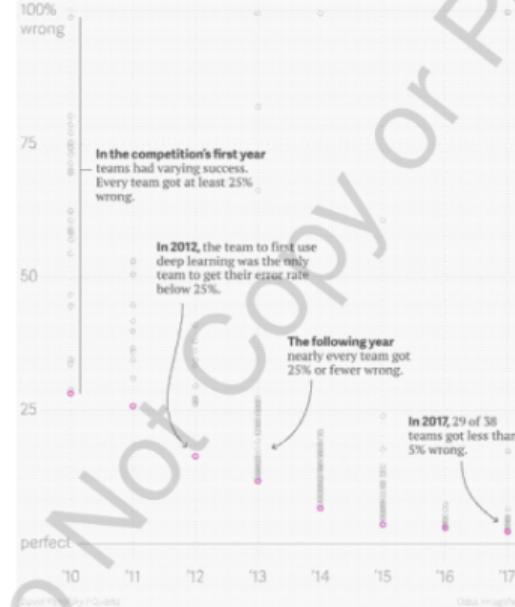


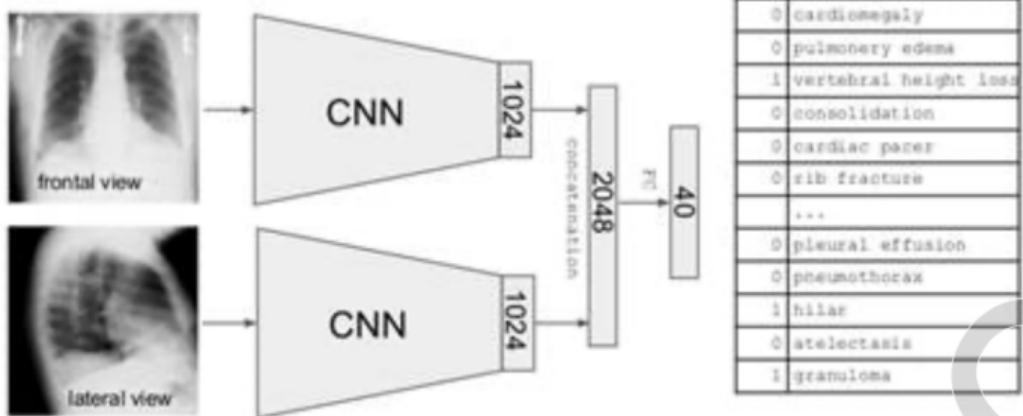
Exhibit 4 ImageNet Large Scale Visual Recognition Challenge Results

ImageNet Large Scale Visual Recognition Challenge results



# Deep Net Models for Image Data

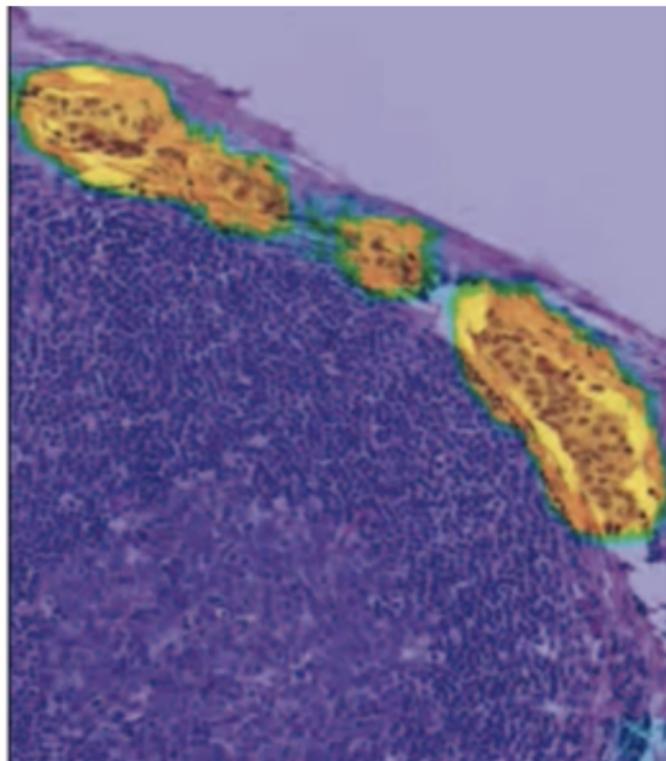
## Exhibit 10 TextRay Sample Input Image



Heart size is normal. Mediastinal width is within normal limits. No edema. No focal infiltrate. No pleural effusion or pneumothorax. Right hilar and right lung base calcifications. There is a very mild anterior wedge deformity of a midthoracic vertebrae, possibly T7. Correlate for midthoracic tenderness. No displaced, acute rib fractures are identified.

# AI in Cancer Detection c.2023

► Link to Video



S6: Zebra Medical Vision: AI in Radiology

# Takeaways from Zebra Case - 1

- We're used to dealing with toy problems and clean(ed) datasets. Real word data can be very messy and take a lot of time to put in a useful format.

# Takeaways from Zebra Case - 2

- Value creation also requires assigning value to elements of confusion matrix for each condition.

# Converting Business Goals to Prediction Problems (In class exercise)

# Let's try this in Groups

- Tell the class what application you have chosen before you get started. 2 groups for each.

**Cases – Each group gets ONE**

- 1) Grocery Retailer – improve its product assortment
- 2) Auto Insurance – improve customer service
- 3) Social media (Instagram) – increase engagement
- 4) Content firm (Spotify) – recommend new content to its users

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- Suggest an (U)nsupervised, (S)upervised **and** (R)einforcement, (G)enerative ML approach.

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- For (U) and (S) specify what variables you will use as  $y$  and  $X$

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- For (R), specify the actions ( $a$ ), states ( $s$ ), and reward ( $\Pi$ )

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- For (G), be clear about what kinds of responses you have in mind.

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- **What metric would you use for improvement?**

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