

6.034

**Identification Trees**

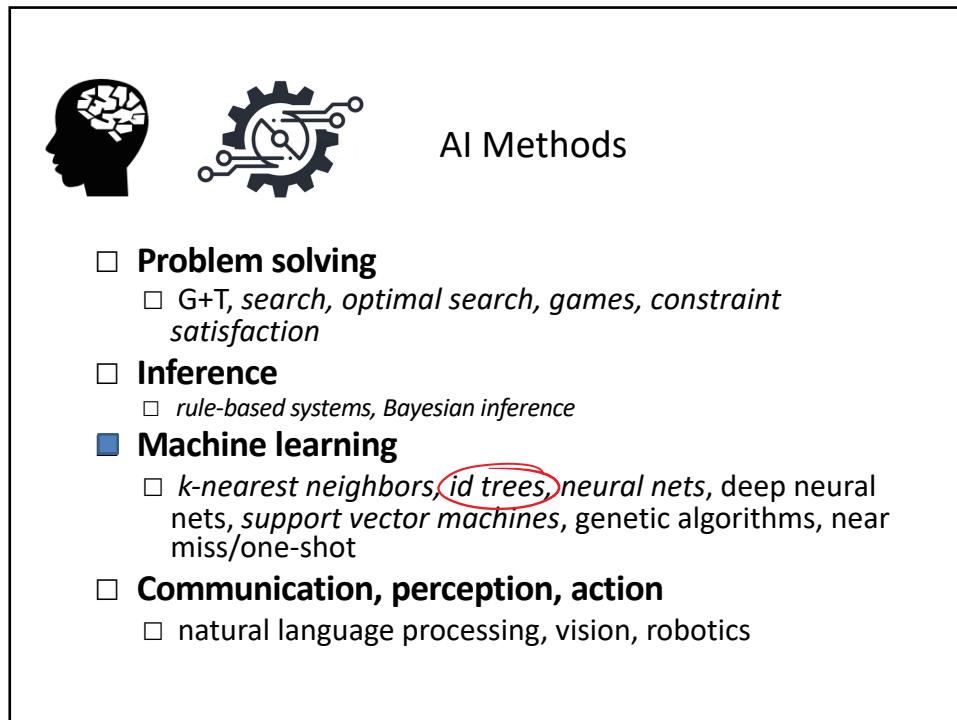
Dr. Kimberle Koile

October 5, 2020

1



2

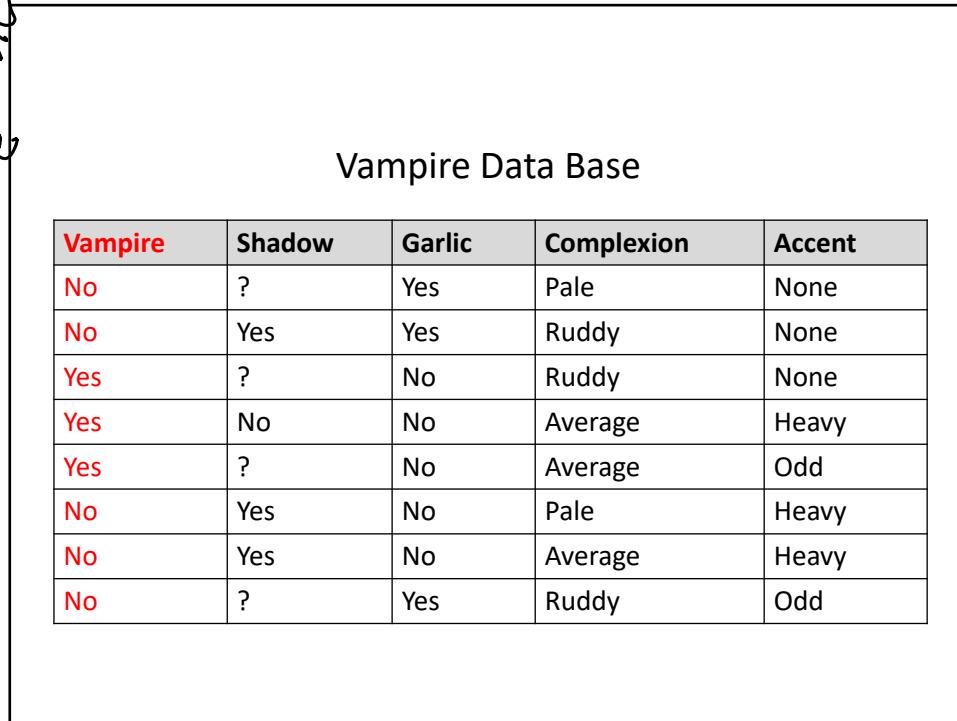


**AI Methods**

- **Problem solving**
  - G+T, search, optimal search, games, constraint satisfaction
- **Inference**
  - rule-based systems, Bayesian inference
- **Machine learning**
  - k-nearest neighbors, *id trees*, neural nets, deep neural nets, support vector machines, genetic algorithms, near miss/one-shot
- **Communication, perception, action**
  - natural language processing, vision, robotics

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- Y/N > non-numeric  
 - some + some  
 - same + same  
 - cost of matter / characteristic  
 - the time / matteristic



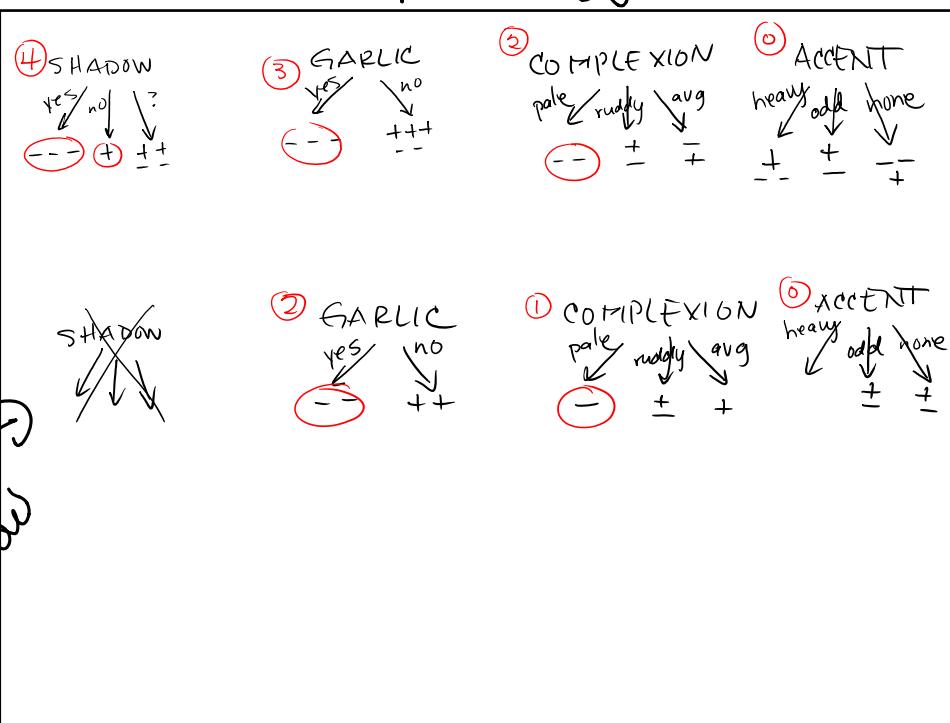
**Vampire Data Base**

Vampire	Shadow	Garlic	Complexion	Accent
No	?	Yes	Pale	None
No	Yes	Yes	Ruddy	None
Yes	?	No	Ruddy	None
Yes	No	No	Average	Heavy
Yes	?	No	Average	Odd
No	Yes	No	Pale	Heavy
No	Yes	No	Average	Heavy
No	?	Yes	Ruddy	Odd

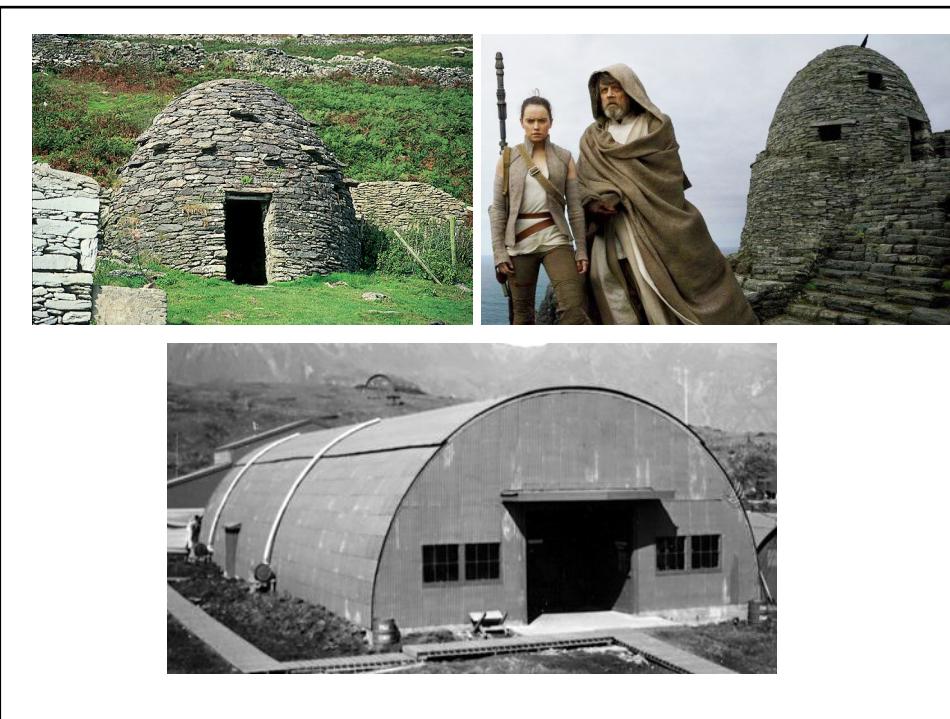
4

OCCAM'S  
razor

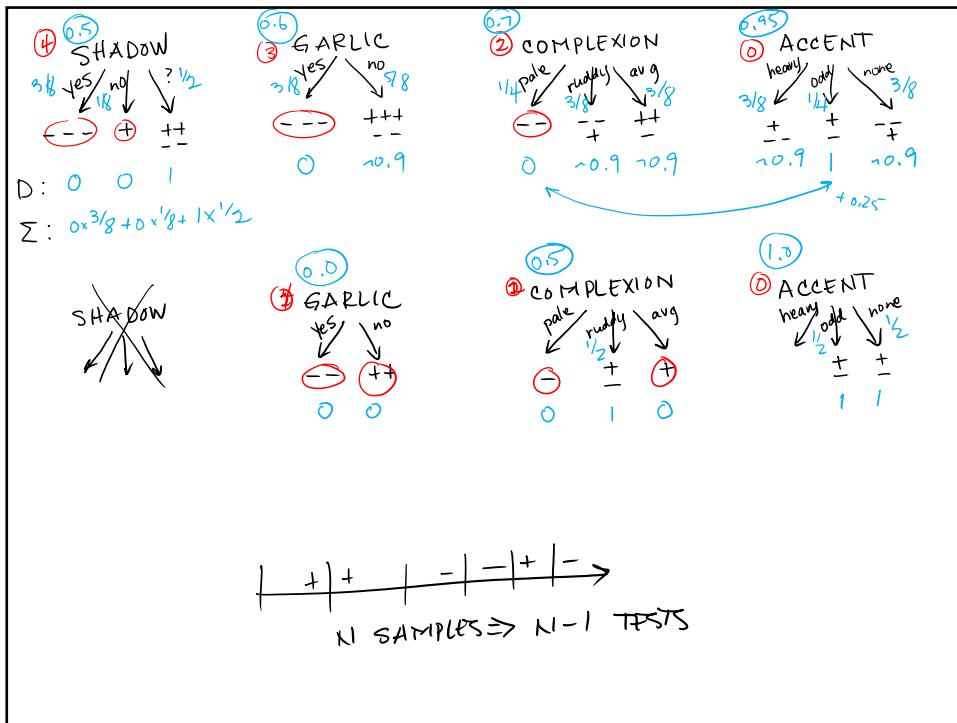
## ID Tree



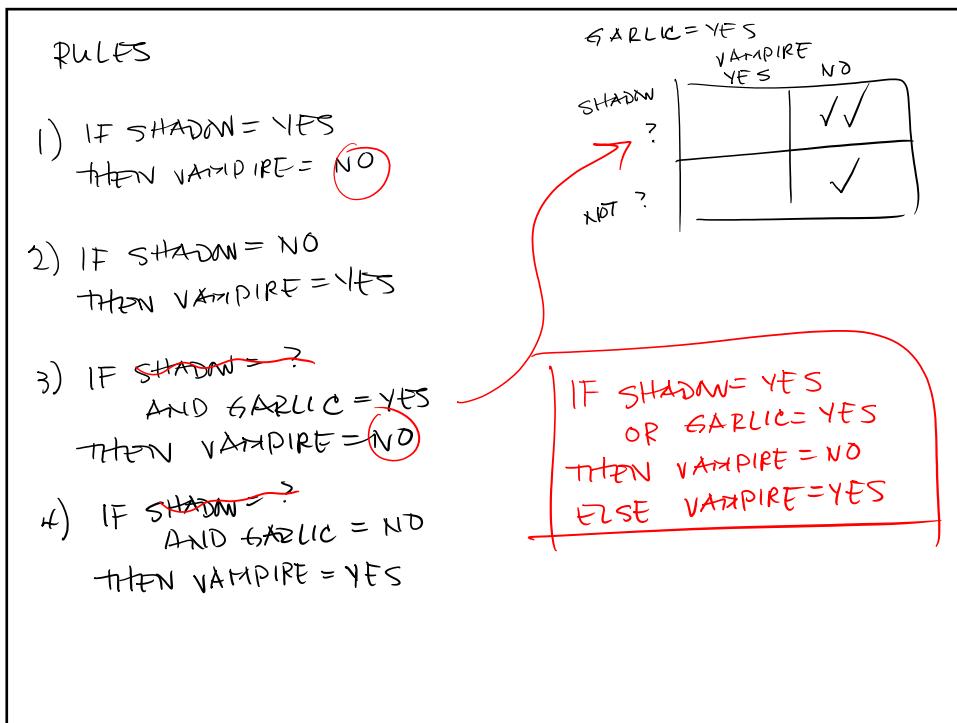
5



6

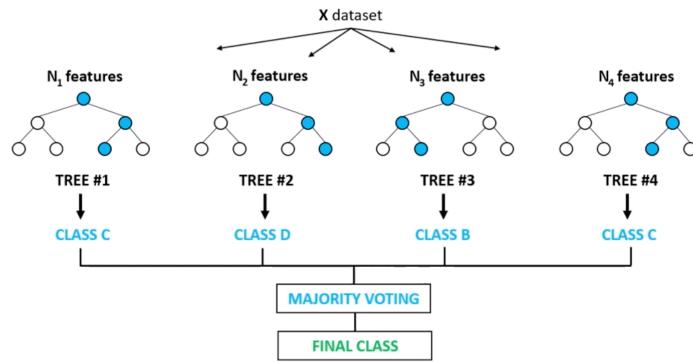


7



8

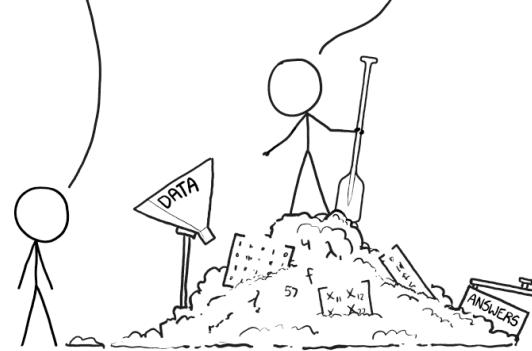
## Random Forest Classifier



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Machine Learning  
xkcd

THIS IS YOUR MACHINE LEARNING SYSTEM?  
 YUP! YOU POUR THE DATA INTO THIS BIG  
 PILE OF LINEAR ALGEBRA, THEN COLLECT  
 THE ANSWERS ON THE OTHER SIDE.  
 WHAT IF THE ANSWERS ARE WRONG?  
 JUST STIR THE PILE UNTIL  
 THEY START LOOKING RIGHT.



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