

# Machine Learning

If a machine learned it would be intelligent

Learning element - makes improvements so that the performance element gives better results

All machine learning algorithms have a critic which tells the learning agent how well it's doing

Problem generator - creates scenarios

which allow the learner to learn  
to experience new and in formative  
situations. Allows the learner  
element to explore

Design of Learning Activities

- What path of performance do I want to improve
- How are these paths represented?

- What happens if feedback is unavailable to the algorithm
- Do we have some kind of tricks to work with?

## Types of Learning

Supervised Learning - feedback on the output  
algorithms

ex decision trees  
neural networks

unsupervised learning - learn  
when there are no hints to  
what the correct outputs are

Probabilistic

Bayesian Learning - Bayes rule

uses probability theory to get  
prob and results

Reinforcement learning - take an action,  
get an evaluation on the action, and  
if the action is correct or not

Inductive Learning

Given a set of examples

$(x, f(x))$  where  $x$  is

The input and  $f(x)$  is the output

Then you learn a new function  $h$   
with approximates  $f$ .

EVERY LEARNER ALWAYS  
HAS A BIAS !!

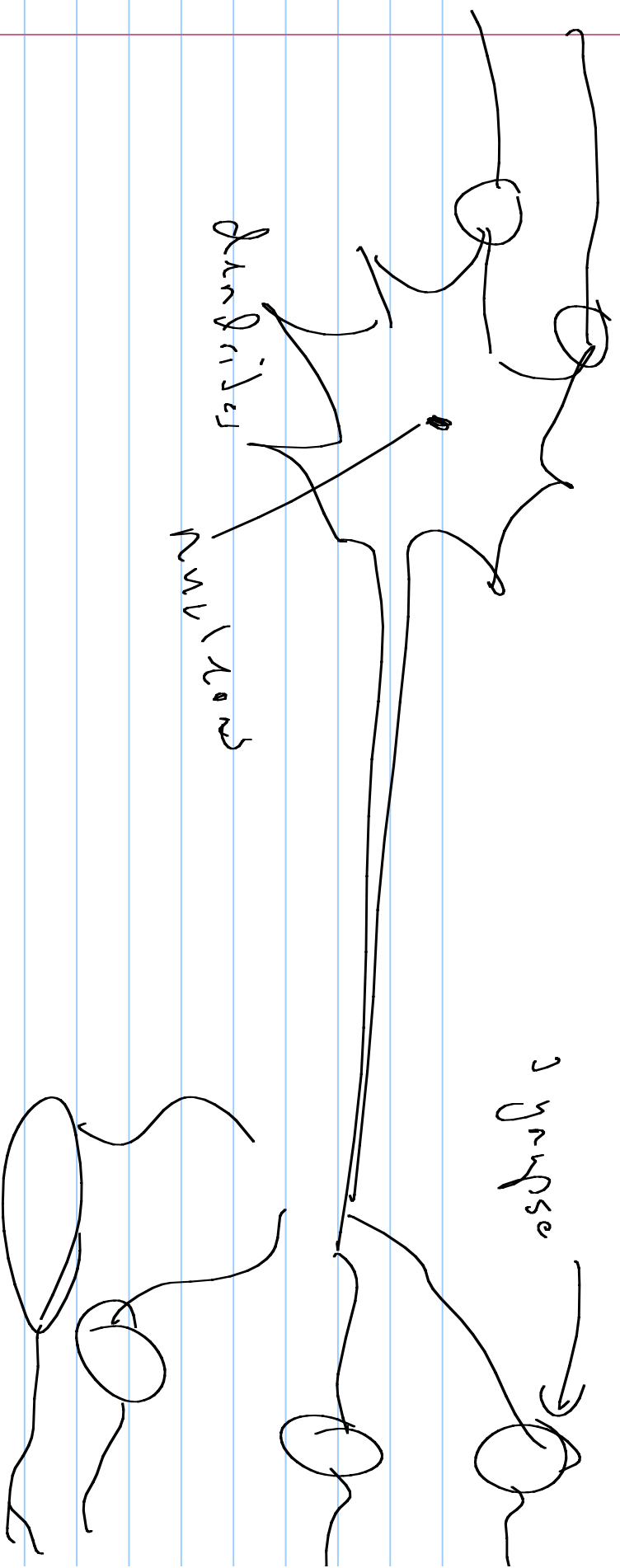
Or first certain hypothesis over others

ANN'S

Artificial Neural Network

Biological Basis - brain -

Neurons



Brain vs. computer  
computer or 1 million times faster  
switching speed

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Time to say good bye President +  
10  
see you

