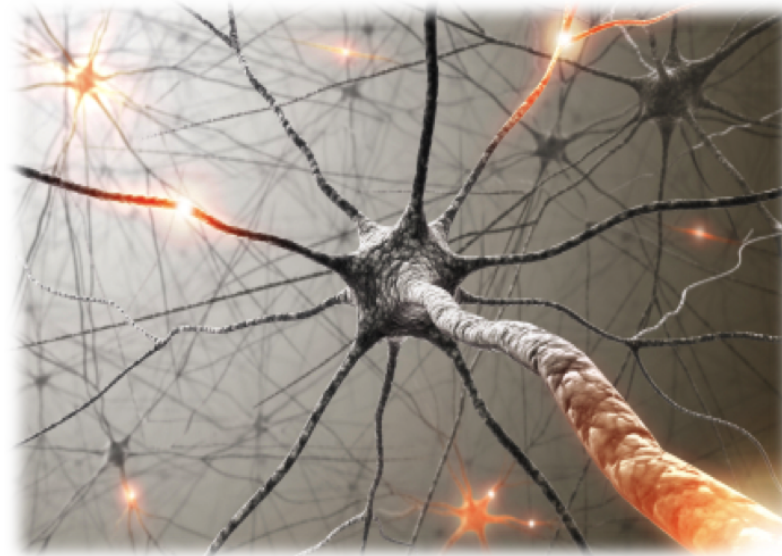
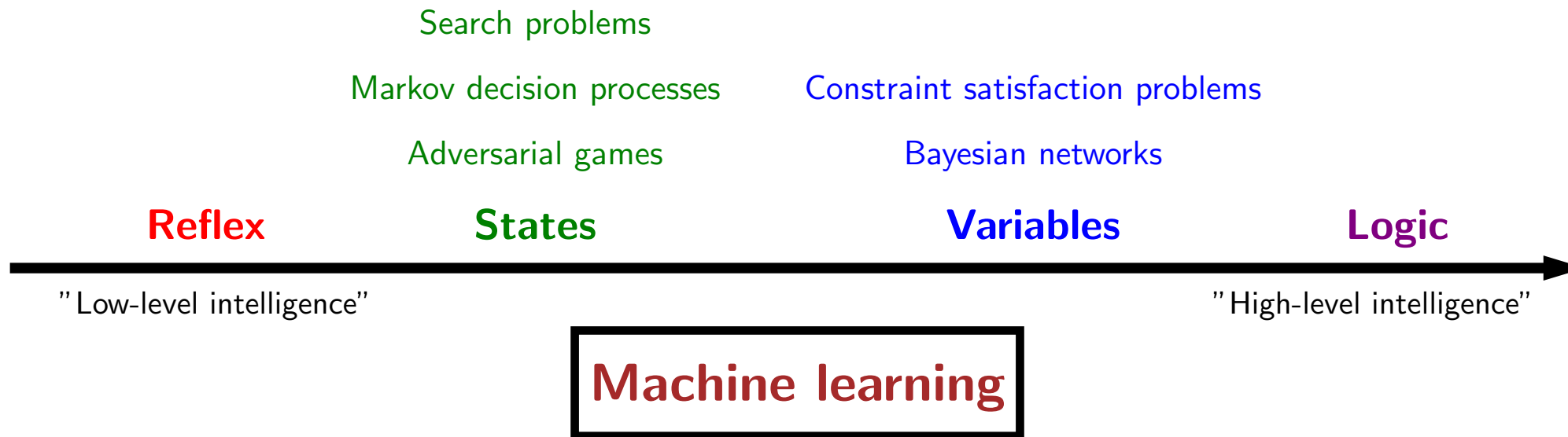




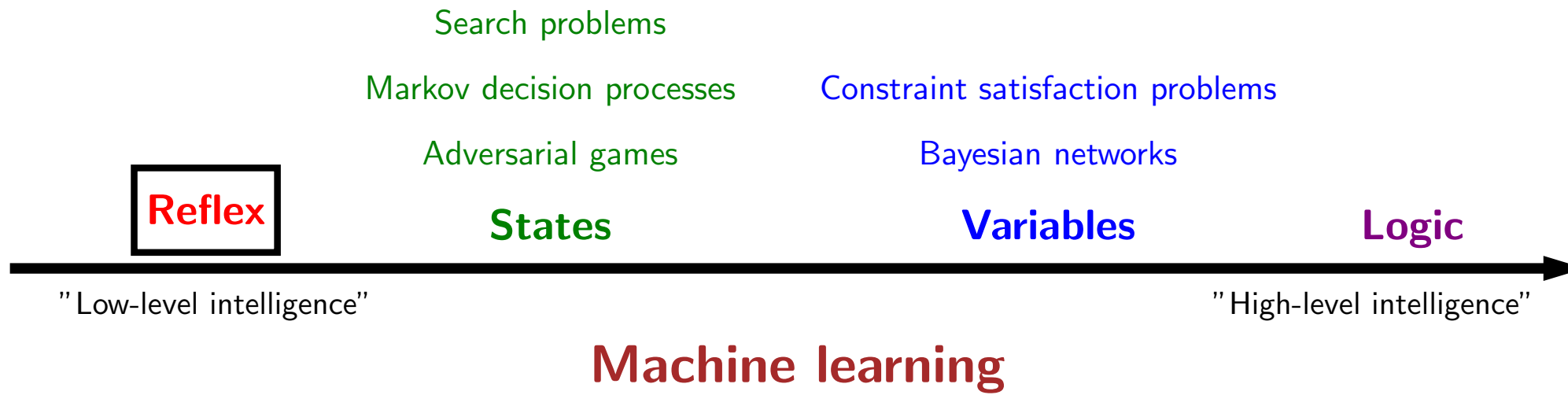
Machine learning: overview



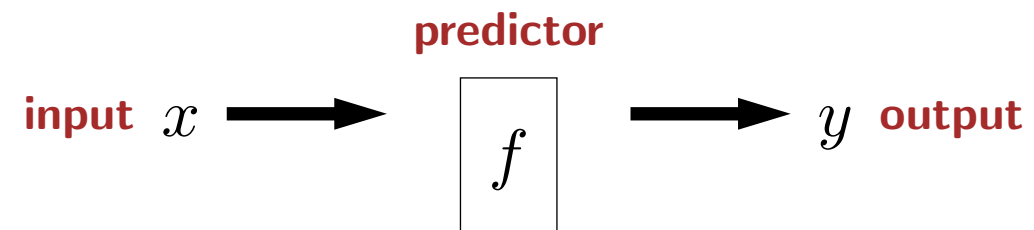
Course plan



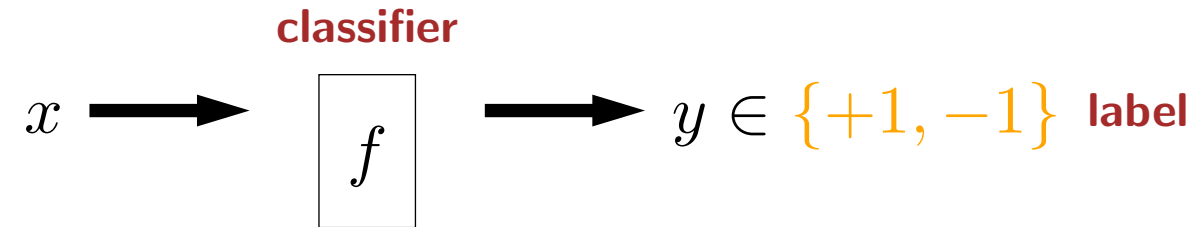
Course plan



Reflex-based models



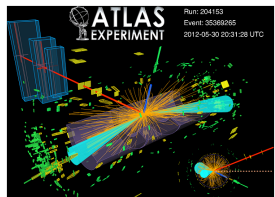
Binary classification



Fraud detection: credit card transaction \rightarrow fraud or no fraud



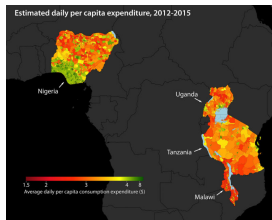
Toxic comments: online comment \rightarrow toxic or not toxic



Higgs boson: measurements of event \rightarrow decay event or background

Regression

$$x \longrightarrow \boxed{f} \longrightarrow y \in \mathbb{R} \text{ response}$$



Poverty mapping: satellite image \rightarrow asset wealth index

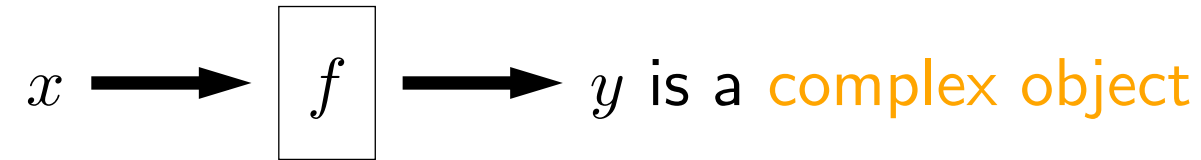


Housing: information about house \rightarrow price



Arrival times: destination, weather, time \rightarrow time of arrival

Structured prediction



Machine translation: English sentence \rightarrow Japanese sentence



Dialogue: conversational history \rightarrow next utterance



Image captioning: image \rightarrow sentence describing image



Image segmentation: image \rightarrow segmentation

Roadmap

Tasks

Linear regression

Linear classification

K-means

Algorithms

Stochastic gradient descent

Backpropagation

Models

Non-linear features

Feature templates

Neural networks

Differentiable programming

Considerations

Generalization

Best practices