CS 182 Exam 2 - Important Terms and Concepts

December 3, 2018

The terms and concepts below are meant to be a resource for the midterm. They are **not exhaustive**, and not all topics will necessarily be covered.

1 Robot Motion Planning

end-effector
task space
configuration space
forward kinematics
inverse kinematics
probabilistically complete and optimal
Rapidly-exploring Random Tree (RRT)
Bi-directional RRT
RRT*
Probabilistic Roadmap (PRM)
single-query vs multi-query algorithms
trajectory optimization
global vs local optimum
feasible solution

2 Hidden Markov Models

definition of conditional probability
definition of independence
law of total probability
Bayes' Rule
Markov assumption
Markov model
finite state machine (FSM)
transition probabilities
filtering
forward algorithm
particle filter

3 Bayes Nets

active and inactive paths and triples
D-separation
factor
join and marginalize
enumeration
variable elimination
prior sampling
rejection sampling
likelihood-weighted sampling

4 Machine Learning

supervised vs unsupervised
parametric vs non-parametric
Naive Bayes
regression model function: linear, logistic
regression loss function: quadratic, absolute
K Nearest Neighbors (k-NN)
K-Means
sillouette diagrams, error plots
training data
testing data
held-out data
overfitting
smoothing
regularization
hyper-parameters
cross-validation
connectivity-based vs centroid-based clustering

5 Game Theory

rational agent
players, actions, utility mapping
normal form
mixed strategy
dominant strategy
Nash equilibrium