

CS3491 Artificial Intelligence and Machine Learning Study Materials

Anna University – CS3491 Artificial Intelligence and Machine Learning Regulation 2021 Syllabus , Notes , Important Questions, Question Paper with Answers Previous Year Question Paper.

UNIT I PROBLEM SOLVING CS3491 Artificial Intelligence and Machine Learning Syllabus

Introduction to AI – AI Applications – Problem solving agents – search algorithms – uninformed search

strategies – Heuristic search strategies – Local search and optimization problems – adversarial search – constraint satisfaction problems (CSP)

UNIT II PROBABILISTIC REASONING CS3491 Artificial Intelligence and Machine Learning Notes

Acting under uncertainty – Bayesian inference – naïve bayes models. Probabilistic reasoning – Bayesian networks – exact inference in BN – approximate inference in BN – causal networks.

UNIT III SUPERVISED LEARNING CS3491 Artificial Intelligence and Machine Learning Important Questions

Introduction to machine learning – Linear Regression Models: Least squares, single & multiple variables,

Bayesian linear regression, gradient descent, Linear Classification Models: Discriminant function – Probabilistic discriminative model – Logistic regression, Probabilistic generative model – Naive Bayes, Maximum margin classifier – Support vector machine, Decision Tree, Random forests

UNIT IV ENSEMBLE TECHNIQUES AND UNSUPERVISED LEARNING CS3491 Artificial Intelligence and Machine Learning Question Bank

Combining multiple learners: Model combination schemes, Voting, Ensemble Learning – bagging, boosting, stacking, Unsupervised learning: K-means, Instance Based Learning: KNN, Gaussian mixture models and Expectation maximization

UNIT V NEURAL NETWORKS CS3491 Artificial Intelligence and Machine Learning Question Paper

Perceptron – Multilayer perceptron, activation functions, network training – gradient descent optimization – stochastic gradient descent, error backpropagation, from shallow networks to deep networks – Unit saturation (aka the vanishing gradient problem) – ReLU, hyperparameter tuning, batch

normalization, regularization, dropout.

TEXT BOOKS: CS3491 Artificial Intelligence and Machine Learning Notes

1. Stuart Russell and Peter Norvig, “Artificial Intelligence – A Modern Approach”, Fourth Edition, Pearson Education, 2021.
2. Ethem Alpaydin, “Introduction to Machine Learning”, MIT Press, Fourth Edition, 2020.

REFERENCES: CS3491 Artificial Intelligence and Machine Learning Important Questions

1. Dan W. Patterson, “Introduction to Artificial Intelligence and Expert Systems”, Pearson Education, 2007
2. Kevin Night, Elaine Rich, and Nair B., “Artificial Intelligence”, McGraw Hill, 2008
3. Patrick H. Winston, “Artificial Intelligence”, Third Edition, Pearson Education, 2006
4. Deepak Khemani, “Artificial Intelligence”, Tata McGraw Hill Education, 2013 (<http://nptel.ac.in/>)
5. Christopher M. Bishop, “Pattern Recognition and Machine Learning”, Springer, 2006.
6. Tom Mitchell, “Machine Learning”, McGraw Hill, 3rd Edition, 1997.

7. Charu C. Aggarwal, "Data Classification Algorithms and Applications", CRC Press, 2014
8. Mehryar Mohri, Afshin Rostamizadeh, Ameet Talwalkar, "Foundations of Machine Learning", MIT Press, 2012.
9. Ian Goodfellow, Yoshua Bengio, Aaron Courville, "Deep Learning", MIT Press, 2016