

Roadmap for ANN (Feedforward)

1. Forward Propagation

2. Activation Function

- Sigmoid, Tanh, ReLU, Leaky ReLU, PReLU, Leaky ReLU, ELU, GLU, Swish Activation, Mish Activation

3. Loss Function

- MSE, L1 Loss (MAE), Huber, Binary Crossentropy, Crossentropy, Softmax Function, KL Divergence, Constrative, Hinge, Triplet Ranking Loss

4. Back Propagation & chain rule

5. Vanishing Gradient Problem

6. Exploding Gradient Problem

7. Optimizers

- GD, SGD, Mini Batch GD, Adam, RMS Prop
- Exponentially Weighted Average, Bias Correction in Exponentially Weighted Average
- Momentum, SWATS
- Weight Decay, Decoupling Weight Decay
- AMSGrad

8. Hyperparameter Tuning & Learning

- Step Learning Rate Decay, Cosine Annealing with warm Restarts, Cyclic Learning Rate, Batch Size v/s Learning Rate

9. Weight Initialization

- Normal Distribution, He Norm, Xavier initialization
- What Happens when all weights are initialized to Same Value

10. Regularization

- L1, L2 Regularization
- Normalization, Layer Normalization, Batch Normalization, Group Normalization
- Drop Connect

11. ANN Regression & Classification