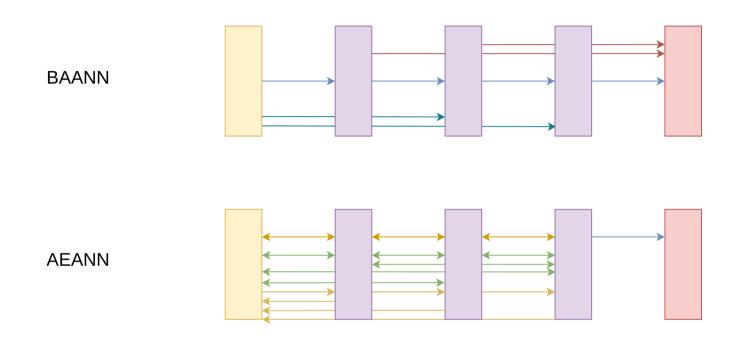
BAANN/AEANN Architecture - Breakaway/Autoencoder Generated Network Development Specification - 06 April 2025a



key:

input layer input
hidden layer hidden
output layer output

Autoencoder (unsupervised):

autoencoderPrediction = "previousLayer"
skip supportSkipLayers:autoencoderPrediction = "allPreviousLayers"
input autoencoderPrediction = "inputLayer"

Breakaway (supervised):

local skip output (BA) supportSkipLayers

BAANN development history summary:

2 Jul 2017: ANN 3m1a - "implement ANN_ALGORITHM_BREAKAWAY_NETWORK" [old] (ANNalgorithmBreakawayNetwork.cpp)

- starts with a network containing only an input and output layer
- adds a new layer after the current output layer
- trains the new net (not new layer) using full backprop
- 1 Nov 2021: ANNtf "add algorithm BAANN breakaway network" (ANNtf2 algorithmBAANN.py)
 - layers are incrementally trained using class targets
 - each layer is fully connected to all previous layers (skip connections)
 - network learns to better (more accurately) discriminate the class target based upon more complex inferences performed by higher layers

20 Aug 2024: AEANNpt - "start option useBreakaway (BAANN) - also condition training of new hidden layers on directly connected output (not just useAutoencoder)"

2 Jan 2025: AEANNpt - "make useAutoencoder and useBreakaway options independent"

Author: Richard Bruce Baxter - © 2017-2025 Baxter AI (baxterai.com)