Figure 1: A) The extractor network, in this case a linear readout, takes the sensory signal \( I(t) \) as input. The synaptic weights \( K \) are trained to reduce the rate of change of the readout weights of the predictor network. This is accomplished by training \( f(t) \) to produce \( z(t) \) from the inputs by modifying \( K \). B) The predictor network, which has no inputs. Instead, it is a recurrent neural network, which has chaotic behavior when it is untrained, with output neuron \( z(t) \). The output can control the network dynamics via the feedback synapses with strengths \( w_f \). The network is trained to produce the signal \( f(t) \) by modifying the synaptic strengths \( w_o \). Since \( f(t) \) is trained with \( z(t) \) and \( z(t) \) is trained with \( f(t) \), the overall method is unsupervised.
Figure 2: An example $I(t)$ with solution. 

A) 10 sample dimensions of $I(t)$. The sensory signal $I(t)$ is composed of a predictable signal, a chaotic signal, which is inherently unpredictable, and white noise. 

B) The predictable signal embedded in each dimension of $I(t)$.

C) The solution found by system after training.