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%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%Shannon Entropy module%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
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function H = ShannonEntropy(X,sig_Max,levels)

% Number of levels for quantization and the signal maximum value
% using the quantizer module that I wrote

[quantized] = quantizer(X,'NLevels', levels,'SigMax', sig_Max);

unique_values = unique(quantized);

Frequency = zeros(size(unique_values));

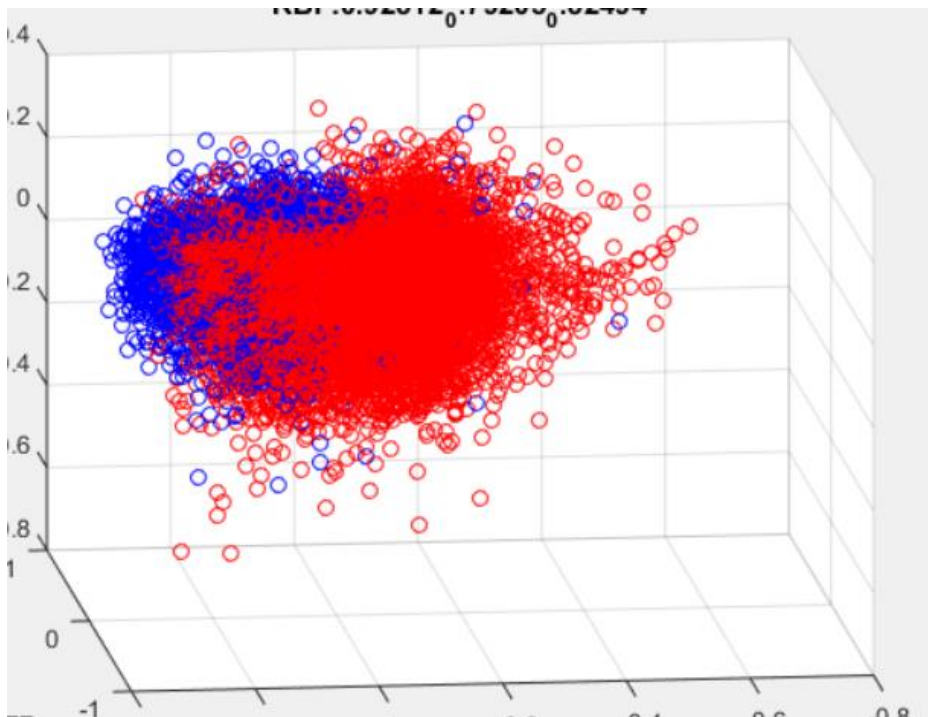
% Calculate sample frequencies
for level = 1:length(unique_values)
    Frequency(level) = sum(quantized == unique_values(level));
end

% Calculate sample class probabilities
P = Frequency / sum(Frequency);

% Calculate Shannon Entropy
H = -sum(P .* log(P));
```

End

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To be modified, as the results on model is not that sufficient, also will try to have more results on more than one patient to see how the feature works!