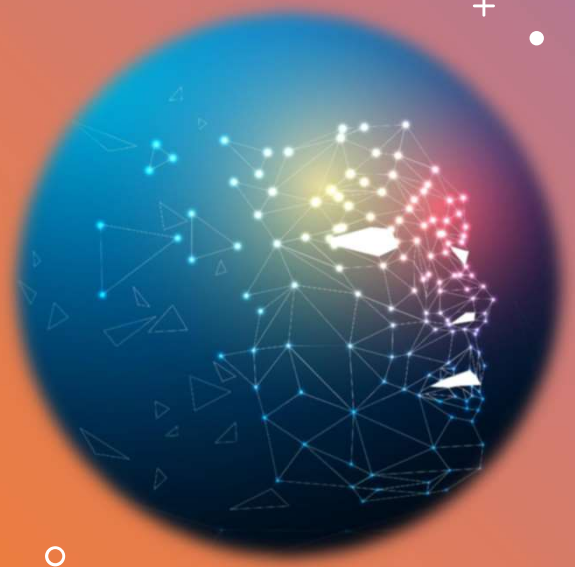
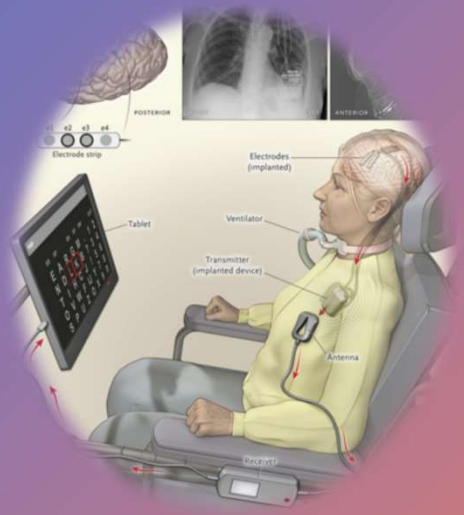
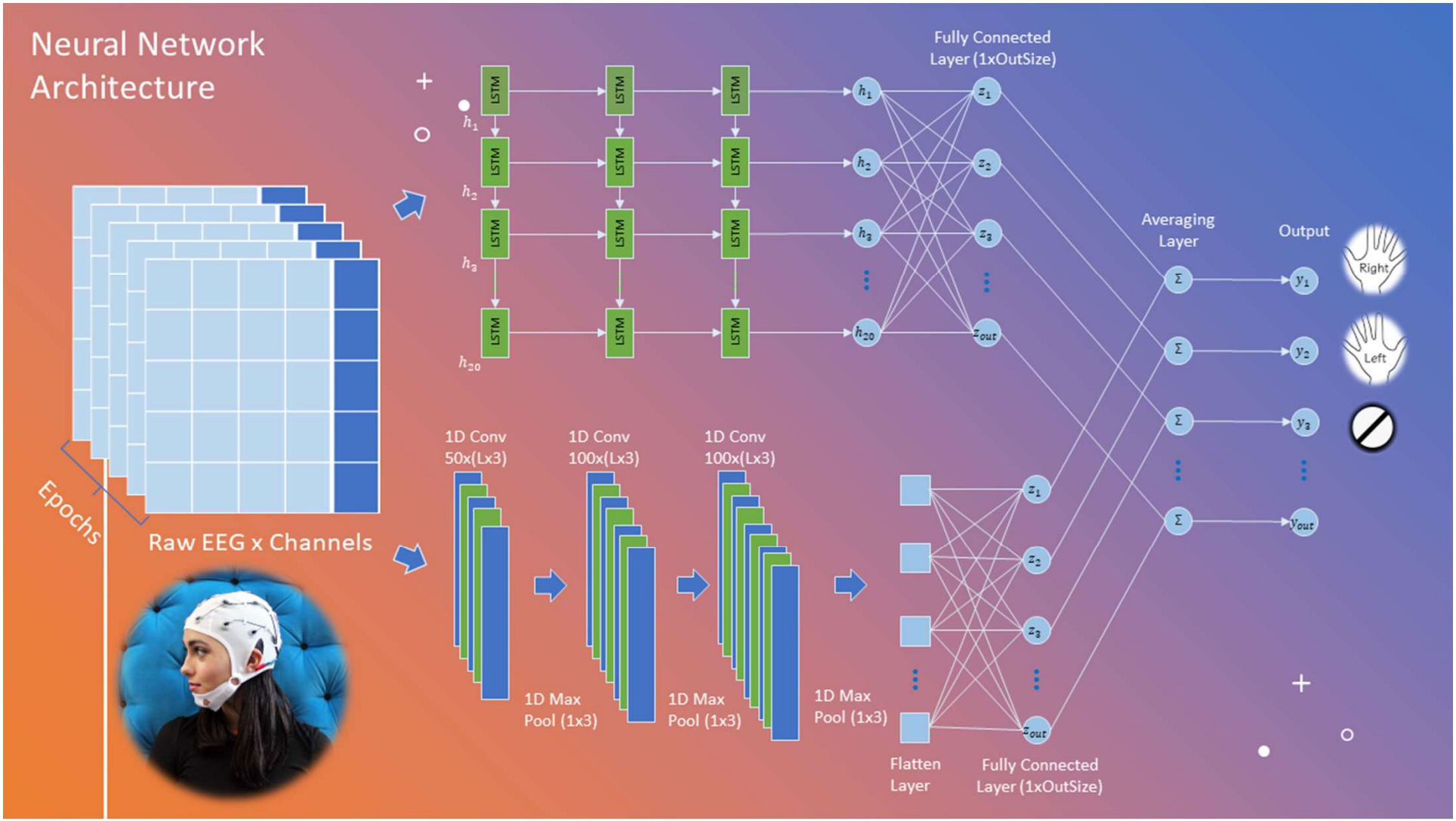
Parallel CNN and RNN Brain-Computer Interface

By Nelson Hidalgo
Presenter # 5

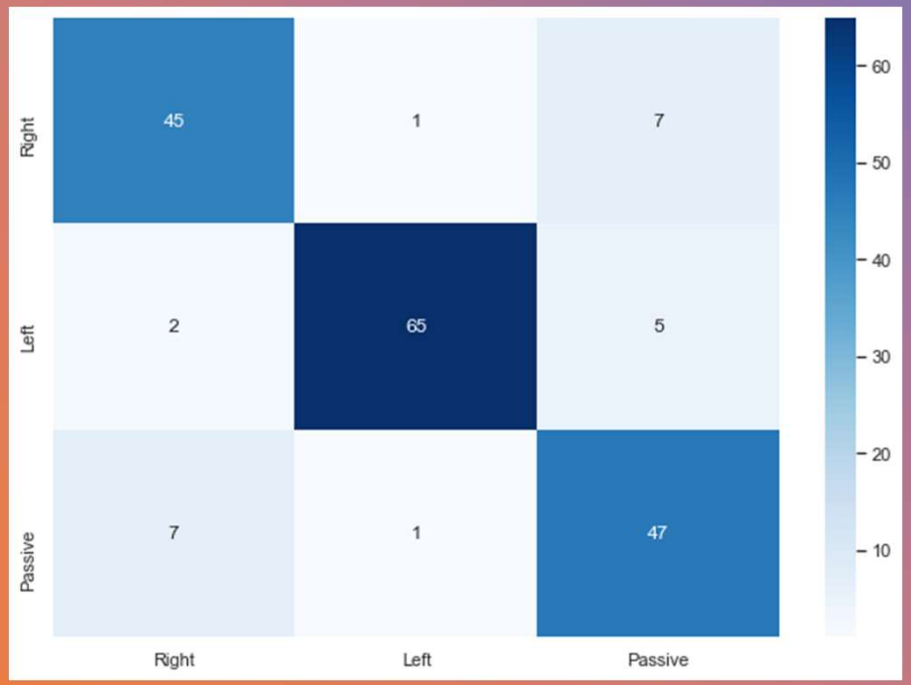


Brain-Computer Interfaces

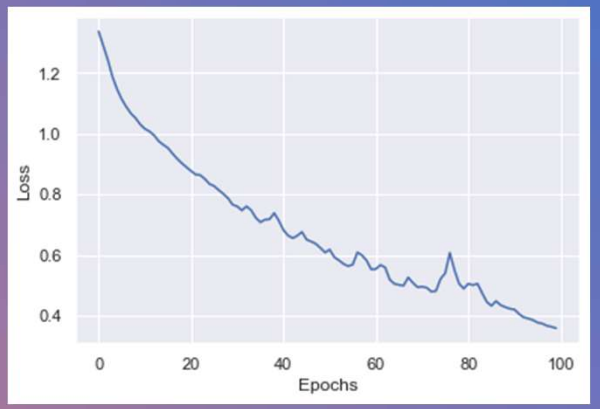


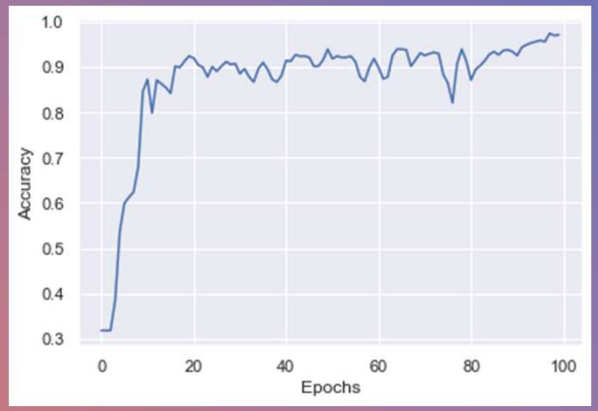

Neural Network Architecture
LSTM
h_1
h_2
h_3
h_{20}
Fully Connected Layer (1xOutSize)
z_1
z_2
z_3
z_{out}
Averaging Layer
Σ
Output
y_1
y_2
y_3
y_{out}
Right
Left
Epochs
Raw EEG x Channels
1D Conv 50x(Lx3)
1D Conv 100x(Lx3)
1D Conv 100x(Lx3)
1D Max Pool (1x3)
1D Max Pool (1x3)
1D Max Pool (1x3)
Flatten Layer
Fully Connected Layer (1xOutSize)

Results



Precision (%)	Recall (%)	F1 Score (%)	Accuracy (%)
87	87	80	87





References

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- Classification of Hand Movements from EEG using a Deep Attention-based LSTM Network by Guangyi Zhang et al 2019
- Deep learning-based electroencephalography analysis: a systematic review by Yannick Roy et al 2019
- Machinelearningmastery.com by Dr. Jason Brownlee