**Latest LSTM Results**

model = Sequential([ #35+ mins

    LSTM(256, input\_shape=(win\_length, num\_features), return\_sequences=True),

    Dropout(0.3),

    LSTM(128, return\_sequences=True),

    Dropout(0.3),

    LSTM(128, return\_sequences=True),

    Dropout(0.3),

    LSTM(64),

    Dense(64, activation='relu'),

    Dropout(0.3),

    Dense(32, activation='relu'),

    Dropout(0.2),

    Dense(1)

])

Mean Absolute Error (MAE): 0.04815140675522497

Mean Squared Error (MSE): 0.004785946268366612

Root Mean Squared Error (RMSE): 0.06918053388321466

# Define the LSTM model

model = Sequential([ # 8 mins

    LSTM(128, input\_shape=(win\_length, num\_features), return\_sequences=True),

    LSTM(128, return\_sequences=True),

    Dropout(0.3),

    LSTM(64),

    Dropout(0.3),

    Dense(1, activation='leaky\_relu')

])

Mean Absolute Error (MAE): 0.06943381787629392

Mean Squared Error (MSE): 0.006316376392918817

Root Mean Squared Error (RMSE): 0.07947563395732

model = Sequential([ #15 mins

    LSTM(256, input\_shape=(win\_length, num\_features), return\_sequences=True),

    Dropout(0.3),

    LSTM(128, return\_sequences=True),

    Dropout(0.3),

    LSTM(64),

    Dropout(0.2),

    Dense(1)

])

Mean Absolute Error (MAE): 0.058881258369162755

Mean Squared Error (MSE): 0.004260453256319127

Root Mean Squared Error (RMSE): 0.06527214763066347

model = Sequential([ # 33 mins

    LSTM(256, input\_shape=(win\_length, num\_features), return\_sequences=True),

    Dropout(0.3),

    LSTM(128, return\_sequences=True),

    Dropout(0.3),

    LSTM(128, return\_sequences=True),

    Dropout(0.3),

    LSTM(64),

    Dense(64, activation='relu'),

    Dropout(0.2),

    Dense(1)

])

Mean Absolute Error (MAE): 0.05014801504637721

Mean Squared Error (MSE): 0.004105850056959454

Root Mean Squared Error (RMSE): 0.0640769073610724

    model = Sequential([ # 20 mins

    GRU(256, input\_shape=(win\_length, num\_features), return\_sequences=True),

    Dropout(0.3),

    GRU(128, return\_sequences=True),

    Dropout(0.3),

    GRU(128, return\_sequences=True),

    Dropout(0.3),

    GRU(64),

    Dense(64, activation='relu'),

    Dropout(0.2),

    Dense(1)

])

Mean Absolute Error (MAE): 0.05095688652320586

Mean Squared Error (MSE): 0.005465899094394342

Root Mean Squared Error (RMSE): 0.07393171913593205

**FINAL LSTM MODEL**

# 8 Batch size:  
model = Sequential([ # 1hr

    LSTM(256, input\_shape=(win\_length, num\_features), return\_sequences=True),

    Dropout(0.3),

    LSTM(128, return\_sequences=True),

    Dropout(0.3),

    LSTM(64),

    Dropout(0.2),

    Dense(1)

])

Mean Absolute Error (MAE): 0.05117638073347091

Mean Squared Error (MSE): 0.005773326056766139

Root Mean Squared Error (RMSE): 0.07598240623174643

# 32 Batch size:  
model = Sequential([ # 13 mins

    LSTM(256, input\_shape=(win\_length, num\_features), return\_sequences=True),

    Dropout(0.3),

    LSTM(128, return\_sequences=True),

    Dropout(0.3),

    LSTM(64),

    Dropout(0.2),

    Dense(1)

])

Mean Absolute Error (MAE): 0.058487600016612636

Mean Squared Error (MSE): 0.004140952992224818

Root Mean Squared Error (RMSE): 0.0643502369243876

# 64 batch size: **CHOSEN MODEL**

model = Sequential([ # 20 mins

    LSTM(256, input\_shape=(win\_length, num\_features), return\_sequences=True),

    Dropout(0.3),

    LSTM(128, return\_sequences=True),

    Dropout(0.3),

    LSTM(64),

    Dropout(0.2),

    Dense(1)

])

Mean Absolute Error (MAE): 0.050986669725115216

Mean Squared Error (MSE): 0.003993544460290849

Root Mean Squared Error (RMSE): 0.06319449707285317

# 128 batch size:  
model = Sequential([ # 17 mins

    LSTM(256, input\_shape=(win\_length, num\_features), return\_sequences=True),

    Dropout(0.3),

    LSTM(128, return\_sequences=True),

    Dropout(0.3),

    LSTM(64),

    Dropout(0.2),

    Dense(1)

])

Mean Absolute Error (MAE): 0.05668386128265458

Mean Squared Error (MSE): 0.00645752369881714

Root Mean Squared Error (RMSE): 0.08035871887242317

# Batch size: 64 Learning Rate: 0.0005 Patiance: 3

model = Sequential([ #30 mins

    LSTM(256, input\_shape=(win\_length, num\_features), return\_sequences=True),

    Dropout(0.3),

    LSTM(128, return\_sequences=True),

    Dropout(0.3),

    LSTM(64),

    Dropout(0.2),

    Dense(1)

])

Mean Absolute Error (MAE): 0.05490543067000056

Mean Squared Error (MSE): 0.00562192764358487

Root Mean Squared Error (RMSE): 0.07497951482628352