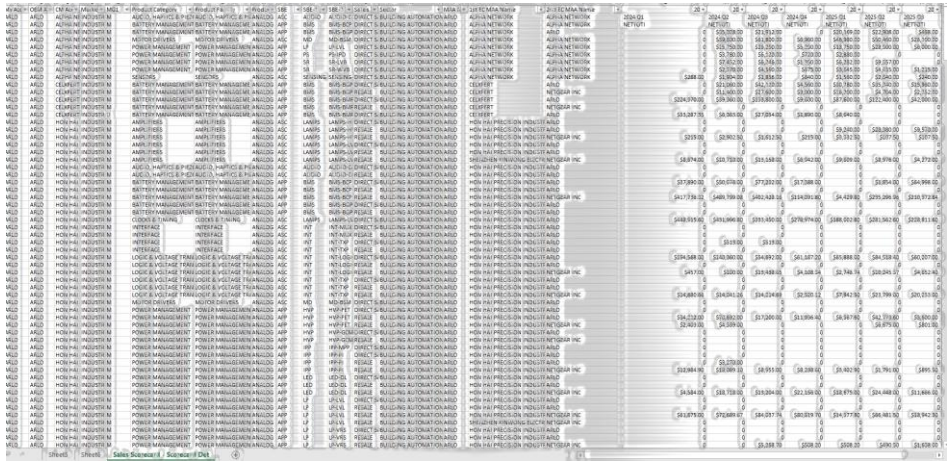
Bay Area Innovation Day Idea

Harini Gurusankar

Varsha Venkatapathy

Background

- Used TI Internal Revenue Tool and witnessed AP/LRP being done
- Forecasting future revenue is complex due to:
  - Rapidly changing design wins
  - Variable customer volume forecasts
  - Product mix across sectors
- Excel struggles with time-based dependencies and non linear trends; not efficient

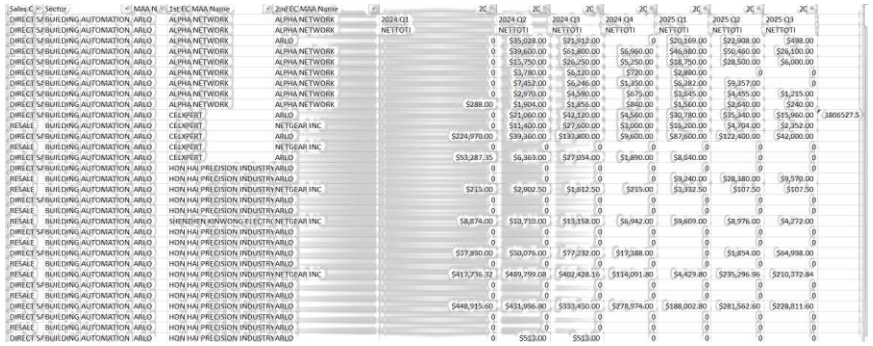


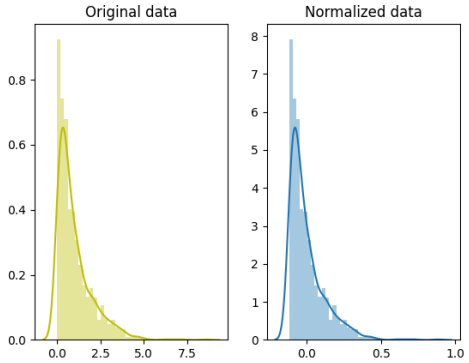
Our Idea

- Goal: Training a Recurrent Neural Network based model to more accurately predict long term revenue for future quarters by combining:
  - Past Revenue Trends
  - Manually entered new Design wins
- Deployed on a website/GUI-User uploads CSV file on step 6,
- Analyzes market trends

Preprocessing Data

- Categorize by Business Unit, clean up data(normalization around mean), correlate revenue per quarter to Business Unit



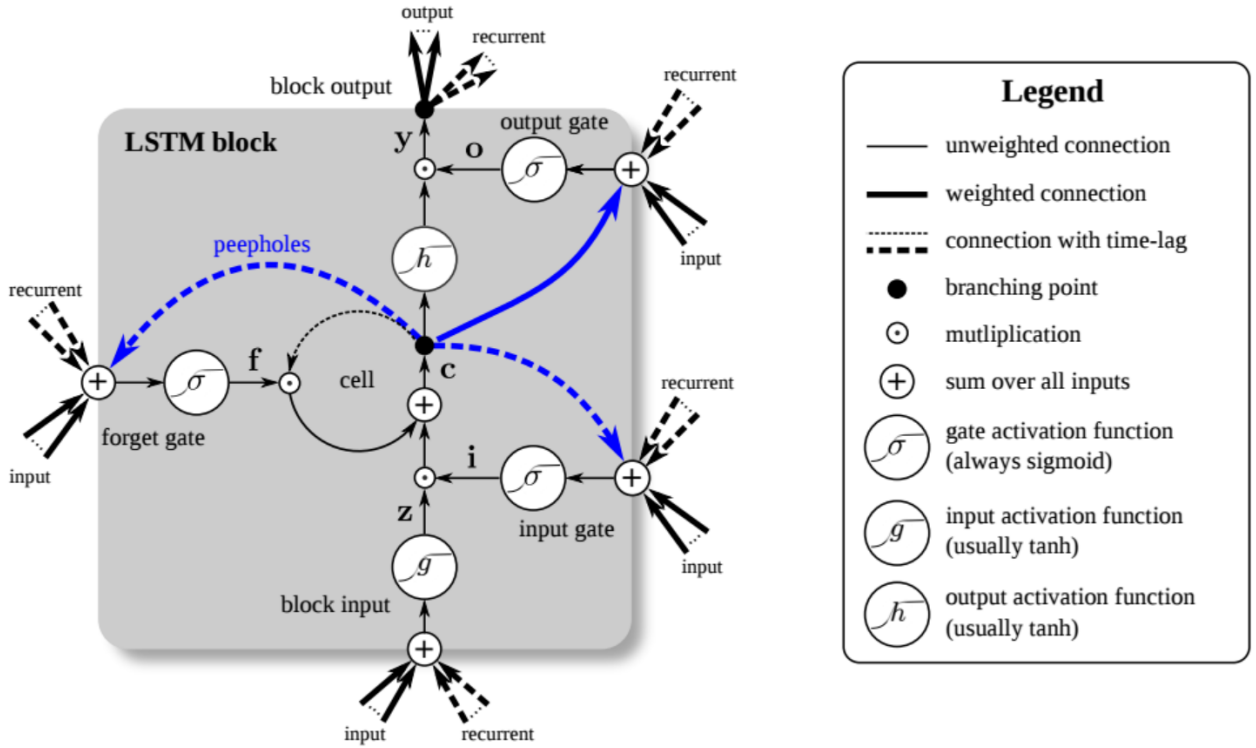


SBE-1 vs. Quarter Revenue

Model Architecture

- LSTM Layer-Best for remembering past patterns, handling sequential data, learning long-term dependencies(ex. Q1 affect on Q4)
- Benefit-Deals with vanishing gradient problem in RNN

Input → Forget
Gate → Cell State
Memory → Input
gate → Update →
Output Gate



Each gate-Fully connected layer with sigmoid activation

Output/Deployment

- All in one GUI/website deployment
- Sales Team can input their own projected quarter 5 years out, and their desired Business Unit, add new devices expected to win, price per new device and the model will output the past revenue trends as a histogram with the expected revenue for the selected quarter and Business Unit

Model Output-LTSM output+(new socket won revenue)

Upload CSV

Dropdown: Select SBE-1

Dropdown: Select Future year and Quarter within the next 5 years

Dropdown: Enter total price expected # new of sockets won per next device per this quarter

Dropdown: Enter expected volume of devices sold per this quarter

Shows how revenue is expected to grow based on past years

How is this better than what is currently being done?

- LTSM leans complex relationships, handles sequential patterns, more efficient with all in one GUI interface, Works with multiple inputs
- Excel can be tedious with lots of data, not as efficient

Future Work

- Train ML model based on different sectors of business like Industrial, Personal Electronics, etc.
- Experiment other RNN/time-series forecasting models- GRU, Stacked LSTM, Echo State networks
- We will continue to train model to project revenue from other classifications such as Product, so the sales team can ideally forecast revenue predictions based on certain categories per account simply by uploading CSV into the GUI