Quebec Energy Consumption Prediction

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Final Results

Models	Mean Absolute Error (MAE)	R^2
SVR	568.183	0.982
DNN	672.941	0.971
LSTM	135.138	0.998
RNN	224.093	0.995
GRU	175.595	0.997
SCNN	151.693	0.997
SCNN-GRU	156.006	0.997

Table 1: Testing Scores for all Implemented Models

Improvements to the models' performance were made by further training them. Note that the SCNN-GRU hybrid model was not yet implemented in previous project deliverables. It is composed of two convolution layers followed by a GRU of a depth of 3 layers with 64 hidden units. This is connected to 3 fully connected layer resulting in the prediction. It is implemented using *PyTorch* framework [2].

Preliminary Results

Models	Mean Absolute Error (MAE)	R^2
SVR	568.183	0.982
DNN	719.876	0.965
LSTM	302.864	0.953
RNN	254.381	0.964
GRU	194.613	0.981
SCNN	167.645	0.985

Table 2: Validation Scores for all Implemented Models

Project Demonstration

The final project demonstration will consist of a simple *React.js* web application that will present the user with an interactive interface to explore and compare model predictions to current (2024) power output data from *Hydro-Québec* [1] using the *MUI X* library. I have some experience in *React.js* so this should be feasible.

References

[1] Hydro-Québec. Electricity demand in québec, 2024. URL: https://www.hydroquebec.com/documents-data/open-data/electricity-demand-quebec/.

[2] Adam Paszke, Sam Gross, Francisco Massa, Adam Lerer, James Bradbury, Gregory Chanan, Trevor Killeen, Zeming Lin, Natalia Gimelshein, Luca Antiga, Alban Desmaison, Andreas Köpf, Edward Z. Yang, Zach DeVito, Martin Raison, Alykhan Tejani, Sasank Chilamkurthy, Benoit Steiner, Lu Fang, Junjie Bai, and Soumith Chintala. Pytorch: An imperative style, high-performance deep learning library. *CoRR*, abs/1912.01703, 2019. URL: http://arxiv.org/abs/1912.01703, arXiv:1912.01703.