ENERGY DISAGGREGATION

Uniqueness added:

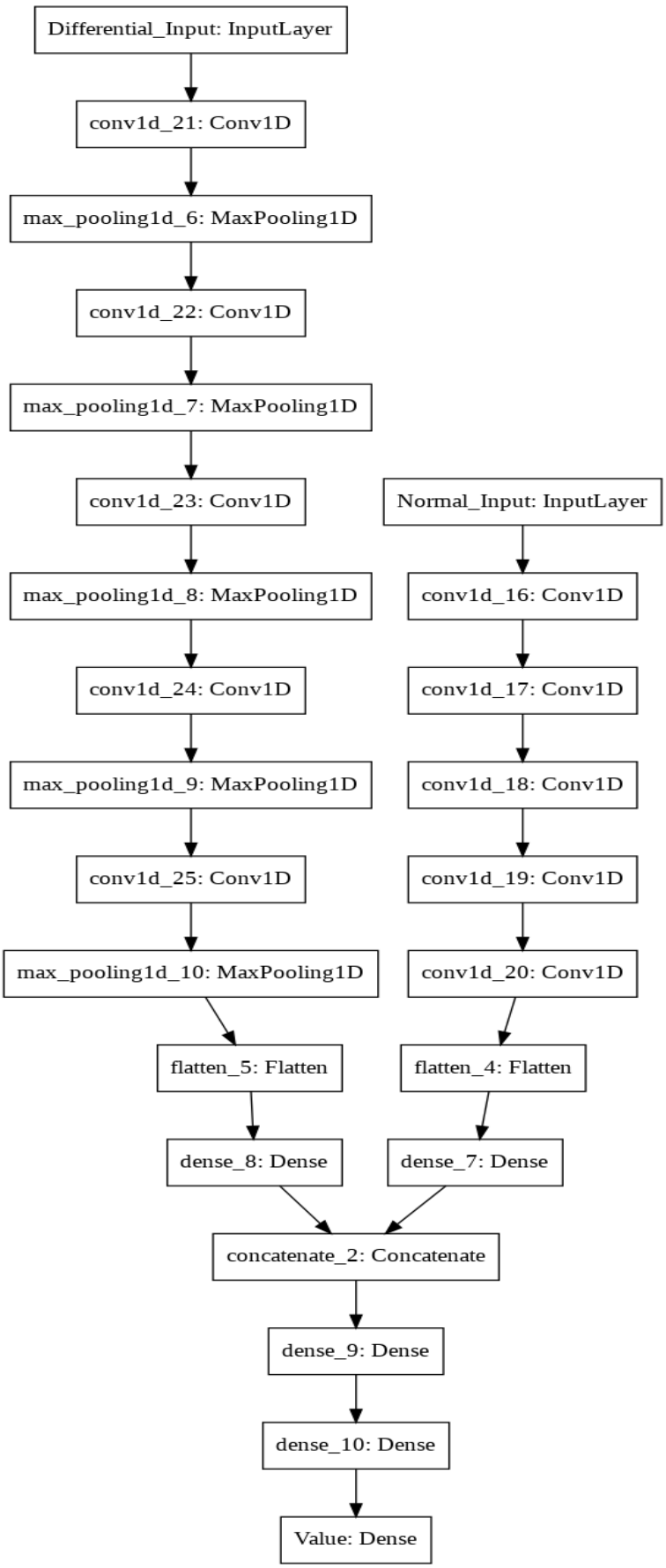
The research paper(https://www.sciencedirect.com/science/article/pii/S2212827119307243) used the difference in mains reading at every consecutive time as input and obtained the state-in-art performance. In the above paper mains reading were directly concatenated with extracted features of differential input just before the last step without extracting any features. And the other paper (https://www.aaai.org/ocs/index.php/AAAI/AAAI18/paper/viewPaper/16623) used mains reading as input(as a sequence) and outputs the mid-value of the output sequence as the final output value. This seq2point approach is second in performance. I combined for my work the best of both worlds. I built a CNN that takes both differential and raw mains reading as input following the seq2point approach.

Impact:-

The proposed solution provides prediction with comparitively less error rate. As a user point of view, users can use it to get knowledge on which appliance is using energy more than necessary and plan accordingly. According to buisseness point of view, the proposed solution requires a series of mains reading at frequency 1Hz to provide accurate results. User can’t input a sequence of meter ratings at frquency 1Hz. A portable device can be made which captures the meter readings and whenever the user demands thorough app or web service, can get the desired information of his/her house.

Architectural Flow:-

Below is the image of the architecture of the network



The whole solution was coded using Keras library. Dataset used was REDD

Scope of the work:-

REDD dataset contained two mains reading for a particular time. So two mains reading were used as input for the network. Input is a sequence of mains reading from time t to time t+N where N=499. Previous researches shows that taking N=499 provides best results. For differencial input a sequence of difference of inputs was used(Mains reading at t+1-Mains reading at t). This work is easily transeferable(train it on one house and it will work similarly for other houses in that area). As this network is basically transfer learning of two researches which when trained on one house, shows amazing result on another house. Due to the lack of computational resources, I was unable to test it on another house