* Preparing an environment for downloading the traffic dataset (in order to run the command ‘from gluonts.dataset.repository.datasets import get\_dataset’):
  + pip install -q transformers datasets evaluate accelerate "gluonts[torch]" ujson tqdm
  + py -m pip install cast\_control==0.10.11
* Repo with model’s code: <https://github.com/thuml/Autoformer/tree/main>
* Huggingface functions which I can use to build the Autoformer: <https://huggingface.co/docs/transformers/model_doc/autoformer>
* websites with model explanation:
  + <https://huggingface.co/blog/autoformer>
  + <https://arxiv.org/pdf/2106.13008.pdf>
* Inputs for the model are:
  + time features - for example year, month, day of month. They have shape (no\_samples, seq\_length, no\_time\_features) (or maybe (seq\_length, no\_time\_features))
  + values - for example number of sold products. They have shape (no\_samples, seq\_length, values\_dim) (or maybe (seq\_length, values\_dim))
  + static features for those values - for example what product has been sold, by which store. Those features are static that means that they are the same for all values. They have shape (no\_samples, values\_dim) (or maybe (values\_dim))
* Time features which are an input for a model will be embedded. I think that those arguments:
  + ‘x’ argument for the ‘TemporalEmbedding’ function
  + ‘x\_mark’ argument for the ‘DataEmbedding\_wo\_pos’ function
  + ‘x\_mark\_enc’ and ‘x\_mark\_dec’ arguments for the Model.forward() function

from the files ‘classes/Embed.py’ and ‘classes/Autoformer’ (from the github repo github.com/thuml/Autoformer) are vectors of shape (no\_samples, seq\_length, no\_time\_features) (or maybe they have shape (seq\_length, no\_time\_features)) where each time feature is a number. x[i, i, 0] represents a month, x[i, i, 1] represents a day, x[i, i, 2] represents a weekday, x[i, i, 3] represents a hour and x[i, i, 4] represents a minute like it is written here:

A computer screen shot of a program

Description automatically generated

Those time features x[i, j, 0], x[i, j, 1], x[i, j, 2], x[i, j, 3] and x[i, j, 4] will be converted into vectors using the Embedding layer just like words are being converted into word embeddings.

This time feature vector x is also the ‘past\_time\_features’ argument for the AutoformerModel.forward() function from huggingface (https://huggingface.co/docs/transformers/model\_doc/autoformer):

A screenshot of a computer

Description automatically generated

So for example if x is our time series data of shape (no\_samples, seq\_length, measurement\_dim) and x\_time\_features are our time features of shape (samples, seq\_length, no\_features) and x[i, j, k] is a measurement made on 11th August at 10:15 then x\_time\_features[i, j] = [8, 11, 10, 15].

* I think that static features for a model will be also embedded like time features