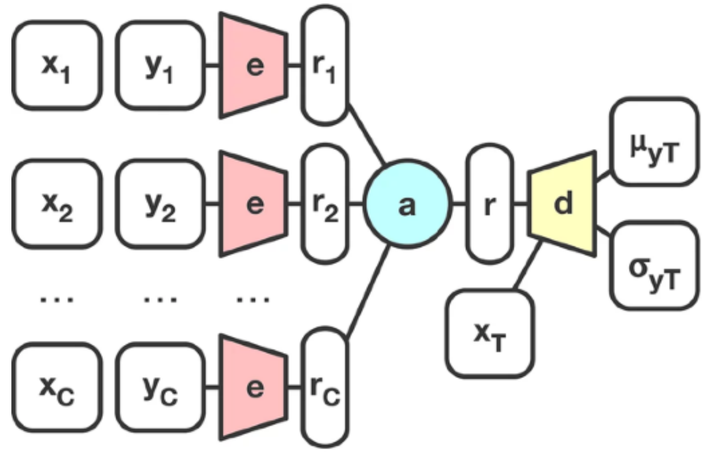
# Preliminary Work

## Conditional Neural Process (CNP)




https://colab.research.google.com/github/deepmind/neural-processes/blob/master/conditional_neural_process.ipynb

- DeepMind proposed at ICML'18
- The basic idea of CNP is to make predictions with help of support set as context.
- Includes four components:
  - The neural network encoder embeds each observation in support set into feature vector.
  - The aggregator maps these feature vectors into an embeddings of fixed dimension.
  - The query data is fed into feature extractor to get the feature vector.
  - Then the decoder takes the concatenation of aggregated embedding and given target data as input and output the corresponding predictions.

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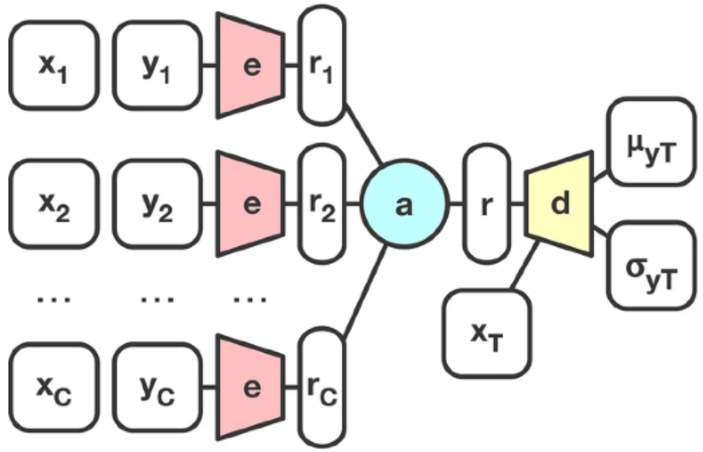
## Limitations of CNP

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- Under-fitting
- For different context data points, their importance is usually different in the prediction.
- However, the aggregator of CNP treat all the support data equally and can't achieve query-dependent context information.
- Moreover, the CNP simply concatenates the input features and numerical label values of post together as input, ignoring the categorical characteristic of labels.