ASKE TA2 KApEESH Documentation

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CONTENTS:

DARPA's Automating Scientific Knowledge Extraction (ASKE) topic area 2 focusing on machine assisted inference. Here we describe in detail the execution module based on GE's Dynamic Bayesian Network (DBN) framework.

CHAPTER

ONE

MODULE: DBN

Wrapper module that integrates GE's DBN framework as the execution engine for KaPEESH as part of DARPA ASKE Topic Area 2. We utilize Python's flask framework to design REST services that can be used through an API.

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RunDBNExecute(*aske_input*, *log_instance*)

Primary DBN execution function. This function sets up the data structures to be used for the DBN execution and performs some level of postprocessing.

Parameters

- **aske_input** – Python dict object containing the DBN execution set up information
- **log_instance** – A logging instance to keep track of the current status

Returns model_details: Python dict object containing the details and outputs from the DBN execution pfdbn: DBN object contains the whole network, prior, posterior samples etc

class StreamToLogger(*logger*, *log_level=20*)

Fake file-like stream object that redirects writes to a logger instance.

as_float(*obj*)

Checks each dict passed to this function if it contains the key "value" Args:

obj (dict): The object to decode

Returns: dict: The new dictionary with changes if necessary

postProcessHypothesis(*model_details*, *aske_input*)

This function takes the data after the DBN execution to analyze the hypothesis that the model can predict data

Arguments: :param model_details: Python dict object containing current update of details :param aske_input: original ubl input dict object :return: model_details: updated model details and input json with outputs from the hypothesis testing including error in prediction of the output nodes and aggregated error measures for model comparison

process()

This function runs the DBN execution as a flask REST service that will called by the KApEESH execution manager. It sets up logging service, takes the POST request's json as the input to the DBN execution.

Returns model_details as the response json

runDBN (*aske_input*, *log_instance*)

Initializes logging and runs the DBN execution. In case of hypothesis generation usecase, sets up the hypothesis and postprocessing.

Parameters

- **aske_input** – Python dict object containing the DBN execution set up information
- **log_instance** – A logging instance to keep track of the current status

Returns model_details: Python dict object containing the details and outputs from the DBN execution pfdbn: DBN object contains the whole network, prior, posterior samples etc

CHAPTER

TWO

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