Letter of Intent and Previous Work

D.Gueorguiev, 10/13/2023

My interests include mathematical modeling via
convex and combinatorial optimization, graph theory and dynamic programming algorithms. Interested
in using probabilistic methods for creating suitable estimators and root cause analysis. Currently working on
Fulfillment Optimization core algorithms redesign at Nike.

Here are few repos representing my interests in those topics. All these repos are work in progress and will be updated periodically.
https://github.com/dimitarpg13/root_cause_analysis_and_model_checking

https://github.com/dimitarpg13/reinforcement_learning_and_game_theory

https://github.com/dimitarpg13/graphs_and_dynamic_programming

https://github.com/dimitarpg13/probabilistic_machine_learning

https://github.com/dimitarpg13/optimization_classification_regression

https://github.com/dimitarpg13/learning_bayesian_networks

https://github.com/dimitarpg13/transformers_intro

Additionally, in my free time I am looking into an implementation of *semantic simulation* for semantic search and semantic inference using reinforcement learning. Short description on Semantic Simulation can be found here:

https://github.com/dimitarpg13/aiconcepts/blob/master/docs/SemanticSimulation.pdf

Some preliminary notes on the semantic simulation process can be found here:

https://github.com/dimitarpg13/aiconcepts/blob/master/docs/OnTheNeedofDynamicSimulationWhenModelingInteractionsOfSemanticStructures.pdf
https://github.com/dimitarpg13/aiconcepts/blob/master/docs/ModelingAttractiveRepulsiveForcesInSemanticProperties.pdf
https://github.com/dimitarpg13/aiconcepts/blob/master/docs/ReinforcementMechanismInSemanticStructureModels.pdf
https://github.com/dimitarpg13/aiconcepts/blob/master/docs/SemanticTemplates.pdf
https://github.com/dimitarpg13/aiconcepts/blob/master/docs/PracticalExamplesUsingSemanticSimulationWithRL.pdf

My coding experience involve python, C++, C, Java.
Here are samples of my C++ code from past endeavors:
https://github.com/google/or-tools/compare/stable...dimitarpg13:ortools:dpg/PWL_solver_stable_py2.7_gtest_scipV6
https://github.com/dimitarpg13/testcode/blob/master/fraction.cpp
https://github.com/dimitarpg13/testcode/blob/master/fraction_mt.cpp
https://github.com/dimitarpg13/testcode/blob/master/fraction_bigint.cpp
https://github.com/dimitarpg13/cpp_testcode/tree/master/SudokuQlik/src

And here are relevant documents to software design, architecture, coding techniques and design

patterns:
https://github.com/dimitarpg13/BigIndex/blob/main/PresentationDGueorguiev2018.pdf
https://github.com/dimitarpg13/InsideTensorflow2Source/blob/master/Understanding%20Tensorflow%202%20source%20code.pdf
https://github.com/dimitarpg13/UnderstandingPythonEcosystem
https://github.com/dimitarpg13/inside_cpp_object_model

And here are few repos about C++ language details and features:
https://github.com/dimitarpg13/cpp_effective_modern
https://github.com/dimitarpg13/cpp_move_semantics
https://github.com/dimitarpg13/cpp_templates_complete_guide
https://github.com/dimitarpg13/cpp_random_pieces