Letter of Intent and Previous Work

D.Gueorguiev, 6/16/2023

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.

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/reinforcement_learning_and_game_theory>

<https://github.com/dimitarpg13/graphs_and_dynamic_programming>

[https://github.com/dimitarpg13/probabilistic\_machine\_learning](https://github.com/dimitarpg13/graphs_and_dynamic_programming)

<https://github.com/dimitarpg13/learning_bayesian_networks>

<https://github.com/dimitarpg13/root_cause_analysis_and_model_checking>

<https://github.com/dimitarpg13/transformers_intro>

Additionally, I am looking into an implementation of [semantic simulation mechanism](https://github.com/dimitarpg13/aiconcepts/blob/master/docs/SemanticSimulation.pdf)

using reinforcement learning. Here are my preliminary notes on the semantic simulation process:

[https://github.com/dimitarpg13/aiconcepts/blob/master/docs/OnTheNeedofDynamicSimulationWhen](https://github.com/dimitarpg13/aiconcepts/blob/master/docs/OnTheNeedofDynamicSimulationWhen%20%20ModelingInteractionsOfSemanticStructures.pdf)

[ModelingInteractionsOfSemanticStructures.pdf](https://github.com/dimitarpg13/aiconcepts/blob/master/docs/OnTheNeedofDynamicSimulationWhen%20%20ModelingInteractionsOfSemanticStructures.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](https://github.com/dimitarpg13/InsideTensorflow2Source/blob/master/Understanding%20Tensorflow%20%20%202%20source%20code.pdf)

[%202%20source%20code.pdf](https://github.com/dimitarpg13/InsideTensorflow2Source/blob/master/Understanding%20Tensorflow%20%20%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>