

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/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%20%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