

## Letter of Intent and Previous Work

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I am looking into an implementation of [semantic simulation mechanism](#) described in the earlier paragraph using reinforcement learning:

Here are my preliminary notes on the semantic simulation process:

<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>

Additionally to NLP, LLMs, and related algorithms 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.

Here are few repos which I created related to these topics and representing my studies on these topics:

[https://github.com/dimitarpg13/reinforcement\\_learning\\_and\\_game\\_theory](https://github.com/dimitarpg13/reinforcement_learning_and_game_theory)

[https://github.com/dimitarpg13/graphs\\_and\\_dynamic\\_programming](https://github.com/dimitarpg13/graphs_and_dynamic_programming)

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

[https://github.com/dimitarpg13/learning\\_bayesian\\_networks/blob/main/docs/LearningBayesianNetworks\\_part1.pdf](https://github.com/dimitarpg13/learning_bayesian_networks/blob/main/docs/LearningBayesianNetworks_part1.pdf)

[https://github.com/dimitarpg13/transformers\\_intro/blob/main/docs/TransformersIntro.pdf](https://github.com/dimitarpg13/transformers_intro/blob/main/docs/TransformersIntro.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:or-tools:dpg/PWL\\_solver\\_stable\\_py2.7\\_gtest\\_scipV6](https://github.com/google/or-tools/compare/stable...dimitarpg13:or-tools: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_mt.cpp)

[https://github.com/dimitarpg13/testcode/blob/master/fraction\\_bigint.cpp](https://github.com/dimitarpg13/testcode/blob/master/fraction_bigint.cpp)

[https://github.com/dimitarpg13/cpp\\_testcode/tree/master/SudokuQlik/src](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](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_effective_modern)  
[https://github.com/dimitarpg13/cpp\\_move\\_semantics](https://github.com/dimitarpg13/cpp_move_semantics)  
[https://github.com/dimitarpg13/cpp\\_templates\\_complete\\_guide](https://github.com/dimitarpg13/cpp_templates_complete_guide)  
[https://github.com/dimitarpg13/cpp\\_random\\_pieces](https://github.com/dimitarpg13/cpp_random_pieces)