Министерство образования и науки Российской Федерации
Санкт-Петербургский политехнический университет Петра Великого
Институт компьютерных наук и технологий
Высшая школа киберфизических систем и управления

УТВЕРЖДАЮ

Директор ВШ КФСУ

_____В.П. Шкодырев

«__»_____ 2018 г.

ЗАДАНИЕ
по выполнению выпускной квалификационной работы
студенту Кристофер Виллиам Влэйк

1. The Topic of the Master's thesis:
   Knowledge Extraction and Automatic Control
2. Date of Master's submission: 17.09.2018
3. The initial data for the Master's thesis:
   a. Systems and products are developed on a daily basis, all of which require a control process. The development of such a control process often requires extensive analysis and requires domain-specific knowledge. The task is to develop an automatic or semi-automatic process for developing control systems to enable faster-to-market, more capable, and better understood products. Such a system should use as little prior information about the black box system as possible.
4. The content of Master's thesis (list of analyzed questions):
   a. What are the unique data experienced by the black box?
   b. What are the repeating structures within the data?
   c. What are the primitive control functions or mechanisms of the black box?
5. The list of graphical materials (with the exact names of illustrations):
   3.1 Black Box Model
   3.2 Split range

3.3 Merge two ranges
4.1 Learning Process Flowchart
4.2 Discretize stream
4.3 Find range
4.4 Discretization and Low-Level Information
4.5 Discretized Space, 6 ranges
4.6 Sequentiality in Knowledge Layers
4.7 Simultaneity in Knowledge Layers
4.8 Triangle Signal
4.9 Recursive interpretation of stream
4.10 States vs Time, Regular Updates
4.11 States vs Time, Parallel Report Updates
4.12 Created States vs Processed Data
5.1 Decision Tree, 'Exclusive Or' Operation
5.2 Classify an instance by MDP policy
5.3 Get best query, by comparing to label
5.4 Summarize the MDP policy to a decision tree
6.1 Binary Data Streams
6.2 Categorical Data Streams
6.3 Black box simulator
6.4 Black Box for Logic Operations
6.5 Black box simulation update process, logic operators
6.6 Black Box for Trigonometric Functions
6.7 Black box simulation update process, trigonometric functions
6.8 Black Box for a Robotic Arm
6.9 Robotic Arm
6.10 Black box simulation update process, robotic arm
7.1 Range Nomenclature
7.2 Example Ranges as Charts
7.3 Two Ranges with Increasing Noise
7.4 Four Ranges with Increasing Noise
7.5 Generated Ranges vs Resolution
7.6 Varying Resolution
7.7 Logic Operations, Percentage Error vs Passes
7.8 Trigonometric Functions, MSE vs Passes
7.9 Trigonometric Functions, Actual vs Predicted

6. Master's thesis advisor: Вячеслав Петрович Шкодырев
7. Date of task issue: 05.02.2018

Master's thesis supervisor Вячеслав Петрович Шкодырев

The task is accepted «___» _____20___г.

Student Кристофер Виллиам Блэйк

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