**ПРАВИТЕЛЬСТВО РОССИЙСКОЙ ФЕДЕРАЦИИ**
**НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ**
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# ОТЧЕТ
# О НАУЧНО-ИССЛЕДОВАТЕЛЬСКОЙ РАБОТЕ

SYNCHRONIZATION OF NEUROMORPHIC NETWORKS OF THE CLOSE WORLD FROM THE POINT OF VIEW OF COMPLEXES
(заключительный)

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# 3 Basic terms, definitions and abbreviations

**Graph** — a set of items connected by edges. A graph G can be defined as a pair (V,E), where V is a set of vertices, and E is a set of edges between the vertices $E \subseteq \{(u, v)|u, v \in V\}$[1].
**Complex**
**Dynamical systems on graphs and complexes**
**Synchronization** — the fact of happening at the same time, or the act of making things happen at the same time[2].
**Simplicial synchronization** — a fundamental dynamical state observed in a wide variety of complex systems and capturing among other phenomena important aspects of brain dynamics and circadian rhythms[3].
**Synchronized neurons**
**Kuramoto model**

# 4 Introduction

**Task description**

**Relevance**

**Subject of research**

**Research methods**

**Purposes and objectives of the work**

**Originality and reliability of the obtained results**

**Theoretical significance**

**Practical value**

# 5 The main part of the research report

**Review and analysis of sources**

**Selection of methods, algorithms, models for solving tasks**

**Description of selected or proposed methods, algorithms, models, techniques**

**Description of the experiment**

**Review and analysis of sources**

**Description of the experiment**

# 6 Conclusion

# List of used sources

[1] *Paul E. Black and Paul J. Tanenbaum* "graph in Dictionary of Algorithms and Data Structures [online], Paul E. Black, ed. 21 June 2021. (accessed 04.07.2022) Available from: https://www.nist.gov/dads/HTML/graph.html

[2] *Cambridge University Press* Meaning of synchronization in English. // Website dictionary.cambridge.org (https://dictionary.cambridge.org/dictionary/english/synchronization). Viewed: 04.07.2022

[3] *Ana Paula Millán, Juan G. Restrepo, Joaquín J. Torres and Ginestra Bianconi* Geometry, Topology and Simplicial Synchronization. P. 32

# 7 Applications

**Application 1**

Link to the project repository with the source code and all used materials.
https://github.com/NikPeg/synchronization-of-neuromorphic-networks-of-the-close-world-from-the-point-of-view-of-complexes