**Deep Chess: A self learning agent with Deep Learning (DL)**

**Algorithms**

A thesis report submitted to the department of Computer Science and Engineering of the World University of Bangladesh in partial fulfillment of the requirement for award of the degree of Bachelor of Science in Computer Science & Engineering.

**Submitted by**

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November, 2018

**LETTER OF TRANSMITTAL**

10 November, 2018

To

Md. Ashiqur Rahman

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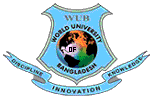
**Subject: Submission of thesis Report.**

Dear Sir,

We are pleased to submit the dissertation entitled **Deep Chess: A self learning agent with Deep Learning Algorithms**. It was a great pleasure to work on such an important topic. The dissertation is prepared according to the requirements and guidelines of the Department of Computer Science and Engineering, World University of Bangladesh (WUB).

We believe that the dissertation will help you in evaluating our research work. It would be a great pleasure for us to interpret any part or whole of the report whenever necessary.

|  |  |  |
| --- | --- | --- |
| Sincerely yours    Md.Nazmul Hasan  Registration no.: WUB 03/15/32/1289 |  | Sincerely yours    Farha Ahmed  Registration no.: WUB 03/15/32/1303 |



**World University of Bangladesh**

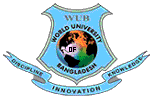
**DECLARATION**

We hereby solemnly declare that the research work entitled **Deep Chess: A self learning agent with Deep Learning Algorithms**, has been supervised by Md. Ashiqur Rahman, Senior Lecturer of the department of Computer Science & Engineering, World University of Bangladesh. We ensure that the thesis report has not been submitted either in whole or part for any degree or Diploma in any university previously.

We hereby warrant that the work we have presented does not breach any existing copyright rule.

We further undertake to indemnify the university against any loss or damage arising from breach of the forgoing obligation.

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Department of Computer Science and Engineering

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**CERTIFICATE**

I hereby certify that the research Report on **Deep Chess: A self learning agent with Deep Learning Algorithms**, is a confide record of research work done by Md. Nazmul Hasan and Farha Ahmed for partial fulfillment of the requirements for award of the degree of the Bachelor of Science in Computer Science and Engineering from World University of Bangladesh.

The thesis report has been carried out under my guidance and is a record of the bona-fide work carried out successfully by the students.

Supervisor

Md. Ashiqur Rahman

Senior Lecturer of the department of Computer Science and Engineering

World University of Bangladesh (WUB)

**ACKNOWLEDGEMENTS**

We are extremely and remain indebted to almighty God who has guided in all ventures to complete our research successfully.

The completion of this research involves and assistance from individuals. It is our pleasure to thank the honorable Vice Chancellor or World University of Bangladesh, professor Dr. Abdul Mannan Choudhury, to whom we owe a lot for giving us an opportunity to complete this research.

We really grateful and wish our profound our indebtedness to by **Md. Ashiqur Rahman, Senior Lecturer,** Department of CSE, World university of Bangladesh, Dhaka. Deep Knowledge & keep interest of our supervisor in the field of **Deep Chess: A self learning agent with Deep Learning Algorithms** to carry out this research. His endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior draft and correcting them at all stage have made it possible to complete this research. We are greatly indebted to all teachers and staffs of the department of Computer Science Engineering and other department of the World University of Bangladesh for their kind assistance in accomplishment of the research paper.

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**ABSTRACT**

The game of chess is the most widely-studied domain in the history of artificial intelligence. The programs are based on a combination of search techniques, domain-specific adaptations, and evaluation functions that have been refined by human experts over several decades. Using an evolutionary algorithm, a computer program has learned to play chess by playing games against itself. In contrast, the Deep Chess has achieved human level performance with the help of deep learning from game of self-play. In this paper, we generalize this approach that can achieve superhuman performance in many challenging domains.

The program learned to evaluate chessboard configurations by using the positions of pieces, material and positional values to assess specific sections of the chessboard. . Starting from random play, and given no domain knowledge except the game rules during evolution, the program improved its play by almost 800 rating points.

In discussion of result, the findings of proposed algorithms and testing results with different parameters has been discussed.

Finally conclusion, limitations and their future works are included.

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