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**YAŞAR UNIVERSITY**

**FACULTY OF ENGINEERING**

**DEPARTMENT OF COMPUTER ENGINEERING**

**COMP4910 Senior Design Project 1, Fall 2018**

**Supervisor: Dr.Öğr.Üyesi Gizem Kayar**

POF: Performance Optimized Fluid System

**Final Report**

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# PLAGIARISM STATEMENT

This report was written by the group members and in our own words, except for quotations from published and unpublished sources which are clearly indicated and acknowledged as such. We are conscious that the incorporation of material from other works or a paraphrase of such material without acknowledgement will be treated as plagiarism according to the University Regulations. The source of any picture, graph, map or other illustration is also indicated, as is the source, published or unpublished, of any material not resulting from our own experimentation, observation or specimen collecting.

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# KEYWORDS

cihanda

# ABSTRACT

Our POF system briefly, receives position data for particles generated by the NVIDIA flex particle-based liquid simulation system. The system determines the required boundaries that the particles occupy in three-dimensional space. Grids are created after the bounding box. The system will detect surface particles and use the hash to access surface particles more effectively.We receive the particle data from NVIDIA flex, where the particles are produced. Particles take up space in the three-dimensional coordinate system. The particles's have minimum and maximum limits to determine the volume occupied by the particles. Boundaries means the Axis Aligned Bounding Box, which is an efficient way to represent a unit in memory. The axis-aligned bounding box must be divided into small cubes to analyze the particles and apply the algorithm. According to our research, it was decided to use one-eighth of the particle radius in the at the first stage. With Surface Recognition algorithm detects surface particles and cells so that we can discard inactive cells. Thus , we have more efficient and better performance by discarding unnecessary cells. Marching cubes algorithm is used to extract a polygonal mesh of an isosurface from a separate three-dimensional scalar field. In our project, marching cubes algorithm is used with Zhu-Bridson algorithm. The Zhu-Bridson algorithm is used in the Marching cubes algorithms to achieve better visual output.

# ÖZET

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