

**IMPLEMENTATION OF NURBS MODELING ON CREATING
CHARACTER ASSET OF THE GAME PRISM ODYSSEY**

THESIS

To fulfill one of the requirements to achieve a Bachelor's degree
Information Technology Study Program



Compiled by
SAHDA SYARIFA NURHASNA
20.60.0111

To

FACULTY OF COMPUTER SCIENCE
UNIVERSITY OF AMIKOM YOGYAKARTA
YOGYAKARTA

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yang disusun dan diajukan oleh

Sahda Syarifa Nurhasna

20.60.0111

telah disetujui oleh Dosen Pembimbing Skripsi
pada tanggal 13 Mei 2024

Dosen Pembimbing,



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Dosen Pembimbing : M. Fairul Filza, S.Kom, M.Kom

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Yogyakarta, 13 Mei 2024

Yang Menyatakan,


Sahda Syarifa Nurhasna



DEDICATION PAGE

Firstly, the author would like to thank The Almighty Allah SWT for with his will and guidance, the author has successfully completed this thesis according to the target.

It cannot be separated to the several parties that the author would like to express their gratitude of. This thesis is dedicated to:

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PREFACE

Praise to God Allah SWT for his blessings and will so that the author can complete the writing of this thesis with the title “Implementation of NURBS Modeling on Creating Character Asset of The Game Prism Odyssey. This thesis is carefully prepared and submitted to fulfill one of the requirements in completing Bachelor Degree of Information Technology Program at AMIKOM University of Yogyakarta.

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The author realizes that this thesis may still has many shortcomings. Therefore, constructive criticism and suggestion will be gladly accepted. Hopefully, the creation of this thesis can be useful and add insight to many.

Yogyakarta, May 13, 2024

Author

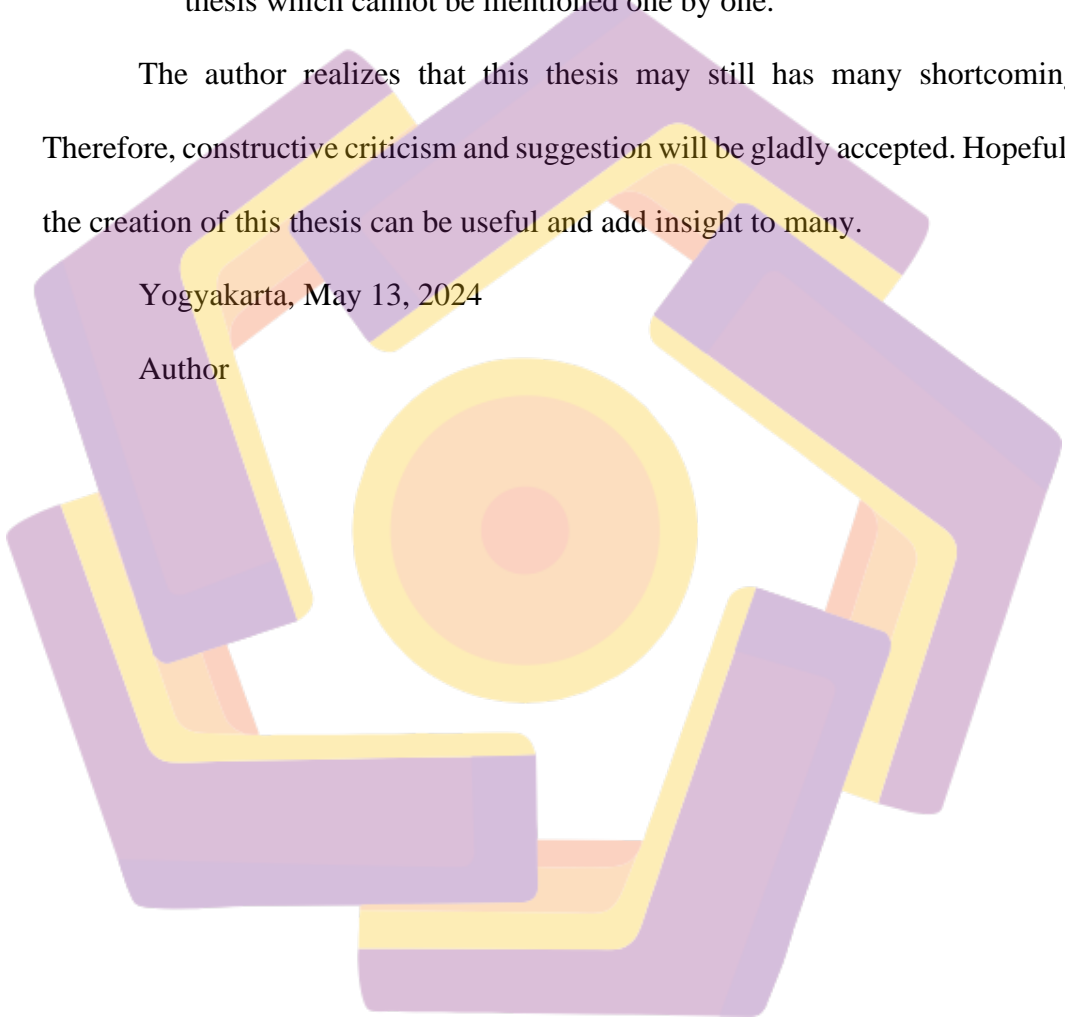


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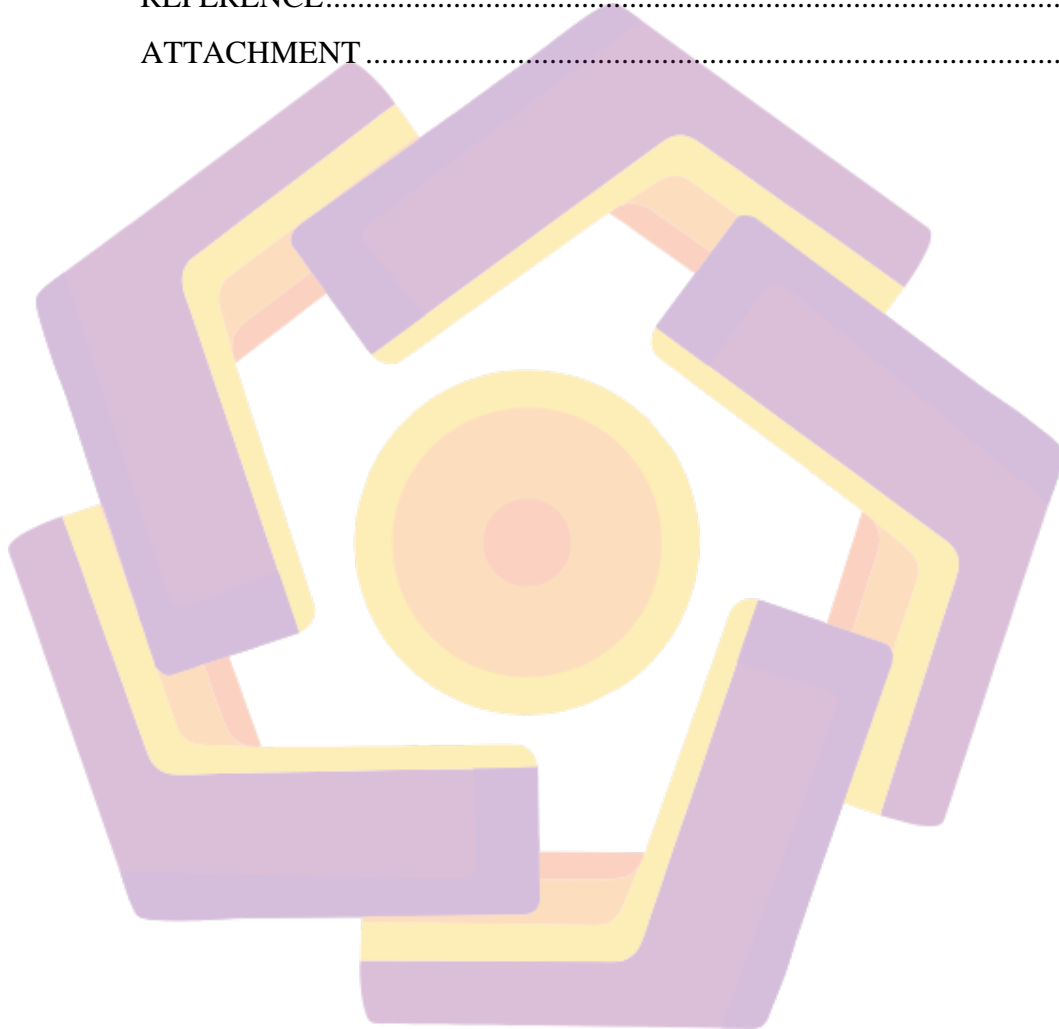
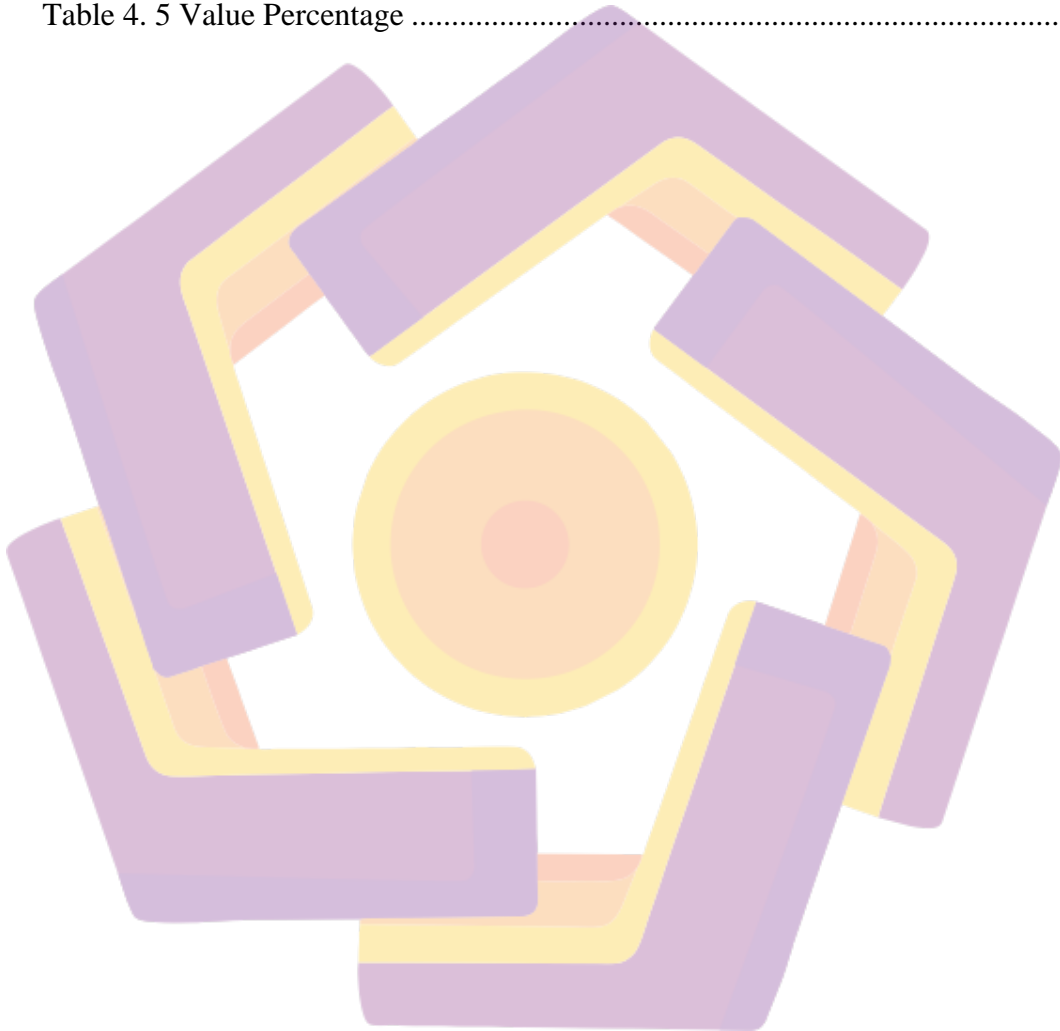


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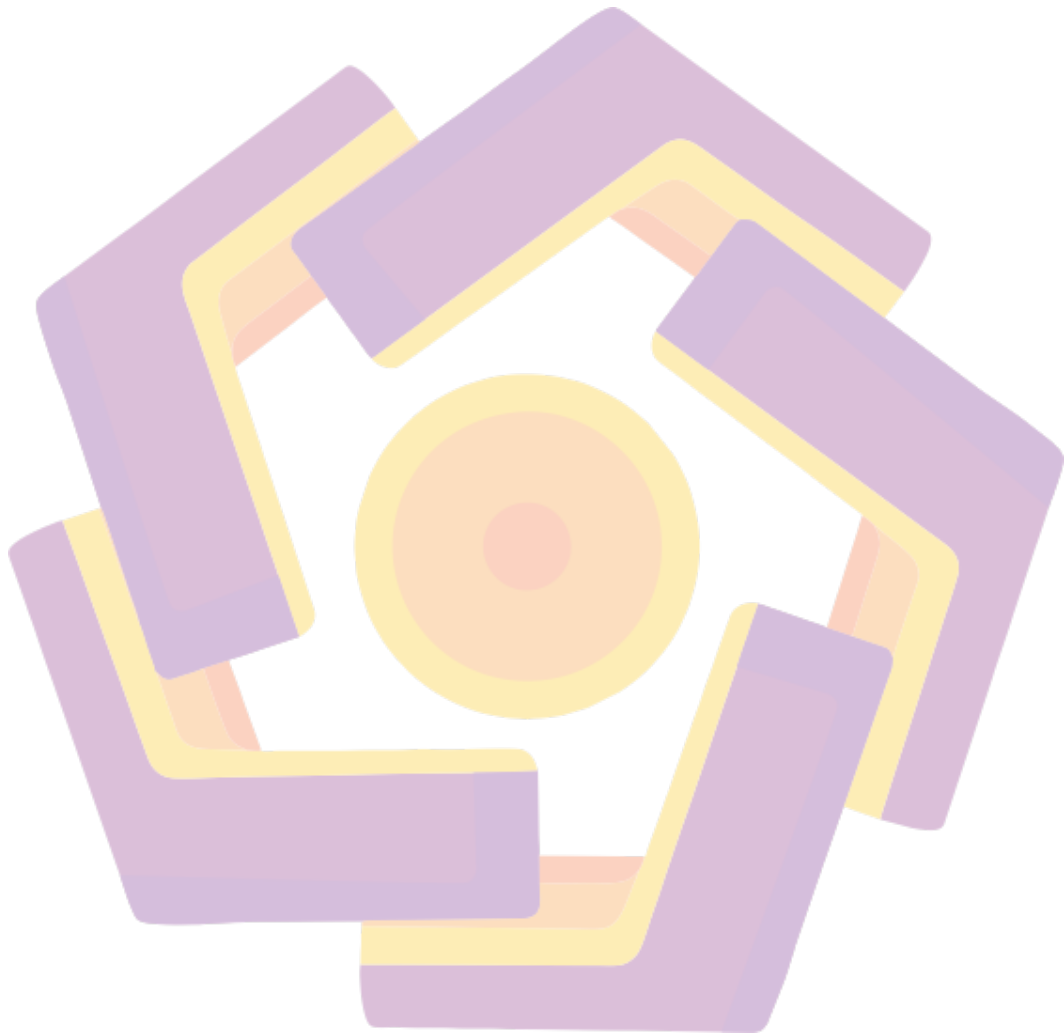


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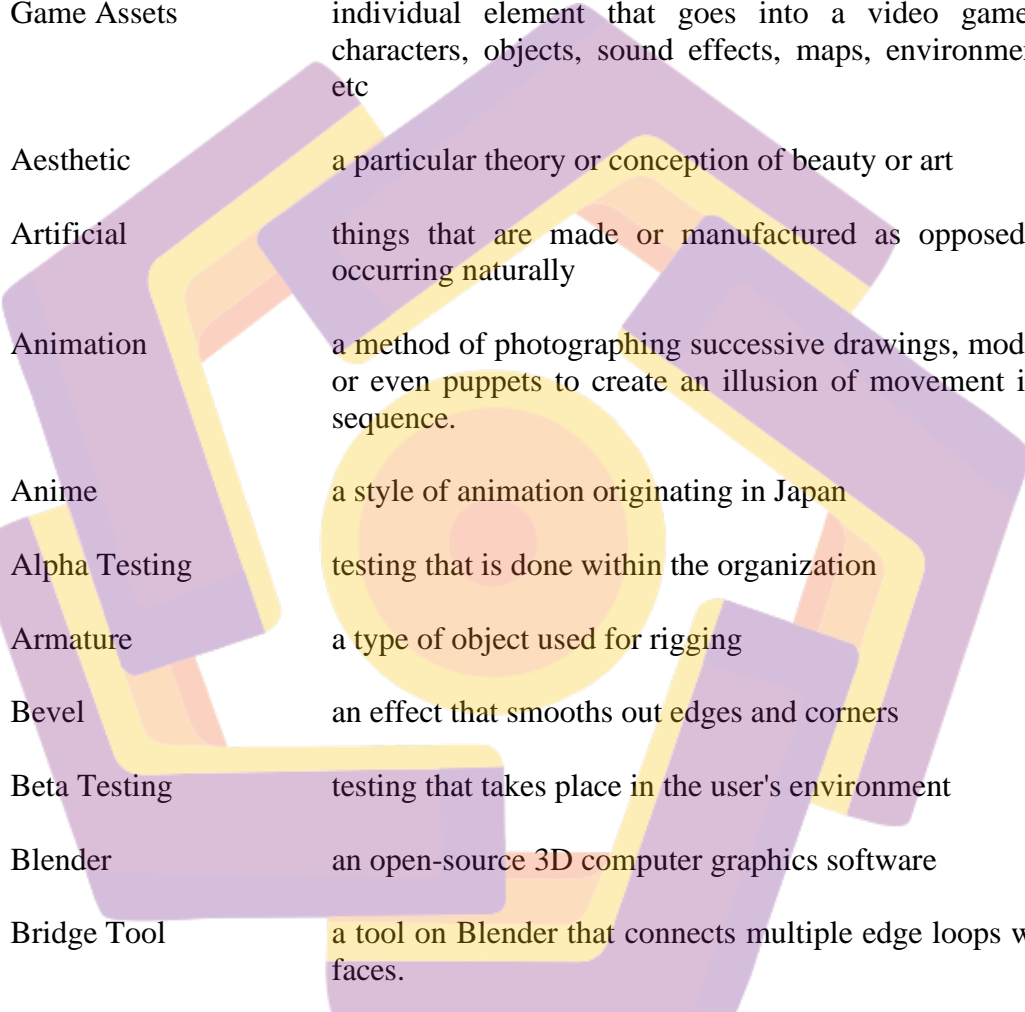


LIST OF SYMBOLS AND ABBREVIATIONS



2D	2 Dimension
3D	3 Dimensional
BSDF	Bidirectional Scattering Distribution Function
FBX	Filmbox
IK	Inverse Kinematics
FW	Forward Kinematics
NURBS	Non-Uniform Rational B-Splines
RPG	Role-playing Game
HMD VR	Head-Mounted Display
MDLC	Multimedia Development Life Cycle
OWG	Open World Games

GLOSSARY OF TERMS

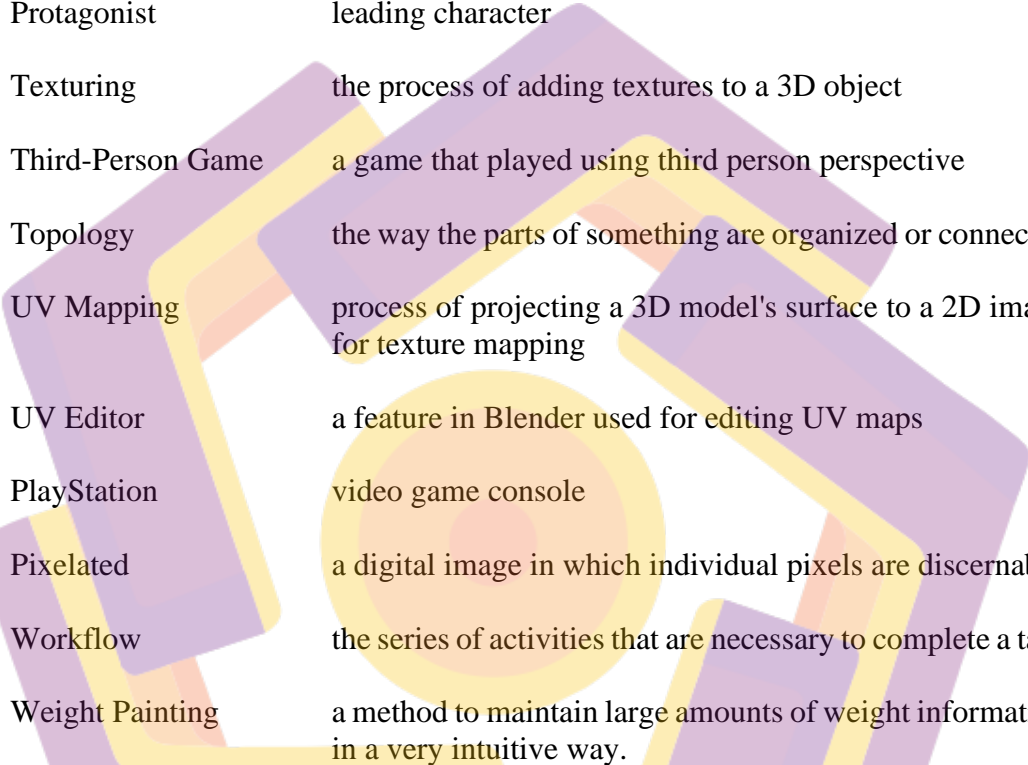


3D Cursor	a point in space that has both a location and a rotation
3D Model	three-dimensional representations of an object or a surface
3D modeling	the process of creating a 3D model with 3D software
Game Assets	individual element that goes into a video game – characters, objects, sound effects, maps, environments, etc
Aesthetic	a particular theory or conception of beauty or art
Artificial	things that are made or manufactured as opposed to occurring naturally
Animation	a method of photographing successive drawings, models, or even puppets to create an illusion of movement in a sequence.
Anime	a style of animation originating in Japan
Alpha Testing	testing that is done within the organization
Armature	a type of object used for rigging
Bevel	an effect that smooths out edges and corners
Beta Testing	testing that takes place in the user's environment
Blender	an open-source 3D computer graphics software
Bridge Tool	a tool on Blender that connects multiple edge loops with faces.
Cell Shading	a type of non-photorealistic rendering designed to make 3-D computer graphics appear to be flat
Concept Art	form of visual art used to convey an idea for a media before it is put into the final product
Choppy	having a disjointed or jerky quality
Cinematic	the visual qualities or aesthetics of a film or video

Color Palette	a chosen set of colors to be used on a graphic
Constraints	a way to automatically control an object's position, scale, or orientation
Control Points	vertex handles
ColorRamp	nodes that is used for mapping values to colors with the use of a gradient
Developer	a person or thing that develops something
Digitalization	adaptation of a system, process, etc. to be operated with the use of computers and the internet
Diffuse BSDF	a shader that is the foundation that many custom materials are based upon
Edge	one-dimensional line that connects two points in a polygon
Edge Modeling	developing the model polygon by polygon which is the smallest part of the object, instead of refining a shape
Edit Mode	a mode in blender for editing an object's shape
Eevee	Blender render engine
Extruding	duplicating vertices, while keeping the new geometry connected with the original vertices
Export	to download and save a file into an alternate format for use in a different program
Face	any of the individual flat surfaces of a solid object
FK	the calculation of the position and orientation of an end effector using the variables of the joints and linkages connecting to the end effector
Gacha	a feature of a computer game in which users can pay to get a new character, ability, object, etc. at random
Game	a structured type of play, usually undertaken for entertainment or fun, and sometimes used as an educational tool

Game Asset	all models, textures, sound effects, levels, animations, cinematics, scripts, and anything else other than code that has been created for the game
Game Engine	software framework primarily designed for the development of video games
Geometry	the mathematics of shapes in three-dimensional space and consists of 3 coordinates
Hardware	tools, machinery, and other durable equipmen
Humanoid	humanlike
IK	the calculation of the variables of the set of joints and linkages connected to an end effector
Joints	points of articulation to control a model
Lay-out	the way something is designed, arranged, or constructed
Level	map, stage, or course,
Loop Cut	a tool in Blender that splits a loop of faces
Manga	a style of Japanese comic books and graphic novels
Mesh	the structural build of a three-dimensional model consisting of polygons
Modelling	the process of creating 3D objects using specialised software
Modifier	automatic operations that affect an object's geometry in a non-destructive way
Motion Graphics	pieces of animation or digital footage that create the illusion of motion or rotation.
NURBS Modeling	modelling technique using B-Spline
Open World Game	a virtual world in which the player can approach objectives freely.
Vertex	a point where two or more-line segments meet.

Video Games	electronic game that can be interacted with using an input device, such as a controller, keyboard, or joystick
RPG	game a game where players take on the role of a character in a fictional story
Polygon	geometric shapes made up of three or more vertices, or corners, and the lines that connect with them
Polygonal Modeling	modeling objects by representing or approximating their surfaces using polygon meshes
Players	a person or thing that plays
Proportional Editing	a way of transforming selected elements while having that transformation affect other nearby elements
Seam	a line along which two pieces of fabric or images are sewntogether
Sound Effects	a sound other than speech or music made artificially for use in a play, movie, or other broadcast production
Script	the written text of a play, movie, or broadcast.
Subdivision Surface	a technique in 3D modeling where a polygonal mesh is refined to create a smoother and more detailed surface.
Storyboard	a roadmap consists of illustrations or images displayed in sequence for the purpose of pre-visualizing any kind of motion picture.
Shader	a computer program that calculates the appropriate levels of light, darkness, and color during the rendering of a 3D scene
Symmetrical	showing symmetry
Software	the programs and other operating information used by a computer.
Render	the process of generating a photorealistic or non-photorealistic image from a 2D or 3D model by means of a computer program



Rigging	process of adding controls to objects, typically for the purpose of animation
Parenting	grouping objects consisting of parent and child
Primitive Object	three-dimensional geometric shapes that are the building blocks for creating complex geometric objects
Protagonist	leading character
Texturing	the process of adding textures to a 3D object
Third-Person Game	a game that played using third person perspective
Topology	the way the parts of something are organized or connected
UV Mapping	process of projecting a 3D model's surface to a 2D image for texture mapping
UV Editor	a feature in Blender used for editing UV maps
PlayStation	video game console
Pixelated	a digital image in which individual pixels are discernable
Workflow	the series of activities that are necessary to complete a task
Weight Painting	a method to maintain large amounts of weight information in a very intuitive way.

INTISARI

Salah satu industri terbesar di dunia yang berkembang luas adalah sektor game. Semua orang senang memainkan berbagai jenis game, termasuk game RPG. Prism Odyssey adalah game RPG dengan sudut pandang orang ketiga, di mana pemain melihat permainan game dari balik avatar, biasanya langsung dari belakang atau di atas bahu mereka. Hal ini memungkinkan pemain untuk melihat lingkungan yang lebih luas di sekitar pahlawan. Karakter adalah aset penting dari sebuah video game, terutama untuk sudut pandang orang ketiga karena kita melihat karakter saat bermain game. Industri game telah banyak memanfaatkan teknologi pemodelan tiga dimensi karena teknologi ini memadukan desain artistik dan teknologi komputer dengan sempurna dengan kesan mendalam. Teknik pemodelan NURBS terutama digunakan untuk menciptakan karakter dalam Prism Odyssey untuk menghasilkan kontur yang lebih halus dan realistis, yang mirip dengan desain awal karakter.

Kata Kunci: NURBS Modeling, Modeling 3D, Modeling Karakter

ABSTRACT

One of the biggest industries in the vast developing world is the game sector. Everyone enjoys playing many different kinds of games, including RPG games. Prism Odyssey is a RPG third-person perspective person game, in which players view game play from behind the avatar, typically directly from behind or over their shoulder. It allows the player to see a wider range of the environment around the hero. Character is an important asset of a video game, especially for third person-view because we see the character while playing the game. The game industry has made considerable use of three-dimensional modeling technology because it perfectly blends artistic design and computer technology with a sense of depth. The NURBS modeling technique is primarily used to create the characters in Prism Odyssey in order to produce smoother, realistic contours that are similar to the character's initial design.

Keyword: *NURBS Modeling, 3D Modeling, Character Modeling*