

THESIS TITLE

BY

SCHOLAR NAME

(Admission No. XXXXXXXXX)



**THESIS
SUBMITTED TO
INDIAN INSTITUTE OF TECHNOLOGY
(INDIAN SCHOOL OF MINES), DHANBAD**

For the award of the degree of
DOCTOR OF PHILOSOPHY
MONTH, 2025

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Abstract

Intravitreal (IVT) therapy is the gold standard for treating posterior segment eye diseases such as Diabetic Retinopathy, Age-related Macular Degeneration, and Endophthalmitis.

Acknowledgments

This thesis stands as a quiet testament to the inner battles fought, the small victories won, and the commitment that carried me forward.

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List of Tables

1.1 Example Table 1

Symbols and Abbreviations

Greek Letters

μ	Coefficient of Friction
ν	Poisson Ratio
τ_i	Traction force at contact interface

Mathematical Notations

$[C]$	Global Damping Matrix
$[M]$	Global Mass Matrix
$[K]$	Global Stiffness Matrix
$\{F\}$	Global Force vector
$\{F_e\}$	Global force vector applied externally
$\{F_c\}$	Resistance force at contact interface against tissue deformation
$\{X\}$	Global Nodal DoF Vector
$\mathbf{x}_i$	Local Nodal Displacement Vector
$\dot{\mathbf{x}}_i$	Local Nodal Velocity Vector
$\ddot{\mathbf{x}}_i$	Local Nodal Acceleration Vector

List of Symbols

A	Area of element in contact
B	Bulk Modulus
E	Elastic Modulus
h	Time step duration
P	Normal contact pressure
s_f	Penalty scaling factor
s_d	Shell diagonal length
u_n	Contact gap
Δu_i	Sliding distances in i^{th} direction

Abbreviations

AMD	Age related Macular Degeneration
API	Application Programming Interface
BLDC	Brushless Direct Current
CFL	Courant–Friedrichs–Lewy
CNVM	Choroidal Neovascular Membrane
CT	Computed Tomography
DoF	Degree of Freedom
DoFs	Degrees of Freedom
DNN	Deep Neural Network

Dedication Message ...

CHAPTER 1

Introduction

Vision is one of the most critical senses for humans that allows us to perceive and interact with our surroundings.

1.1 Reference Example

Add reference in bibliography section. Citation example within paragraph[1], or [2]. Citation example where reference must be present at the beginning of paragraphTripathy et al. [3]

1.2 Table Example

Table 1.1: Example Table

Needle Gauges	$18 - G$	$30 - G$
Experimental Results	1.18 N	0.19 N
Computational Results	1.06 N	0.156 N
% error	10.1	17.89

1.3 Equation Example

$$[M]\{\ddot{X}\} + [C]\{\dot{X}\} + [K]\{X\} = \{F\} \quad (1.1)$$

Where,

$$\{F\} = \{F_e\} + \{F_c\}$$

1.4 Figure Example

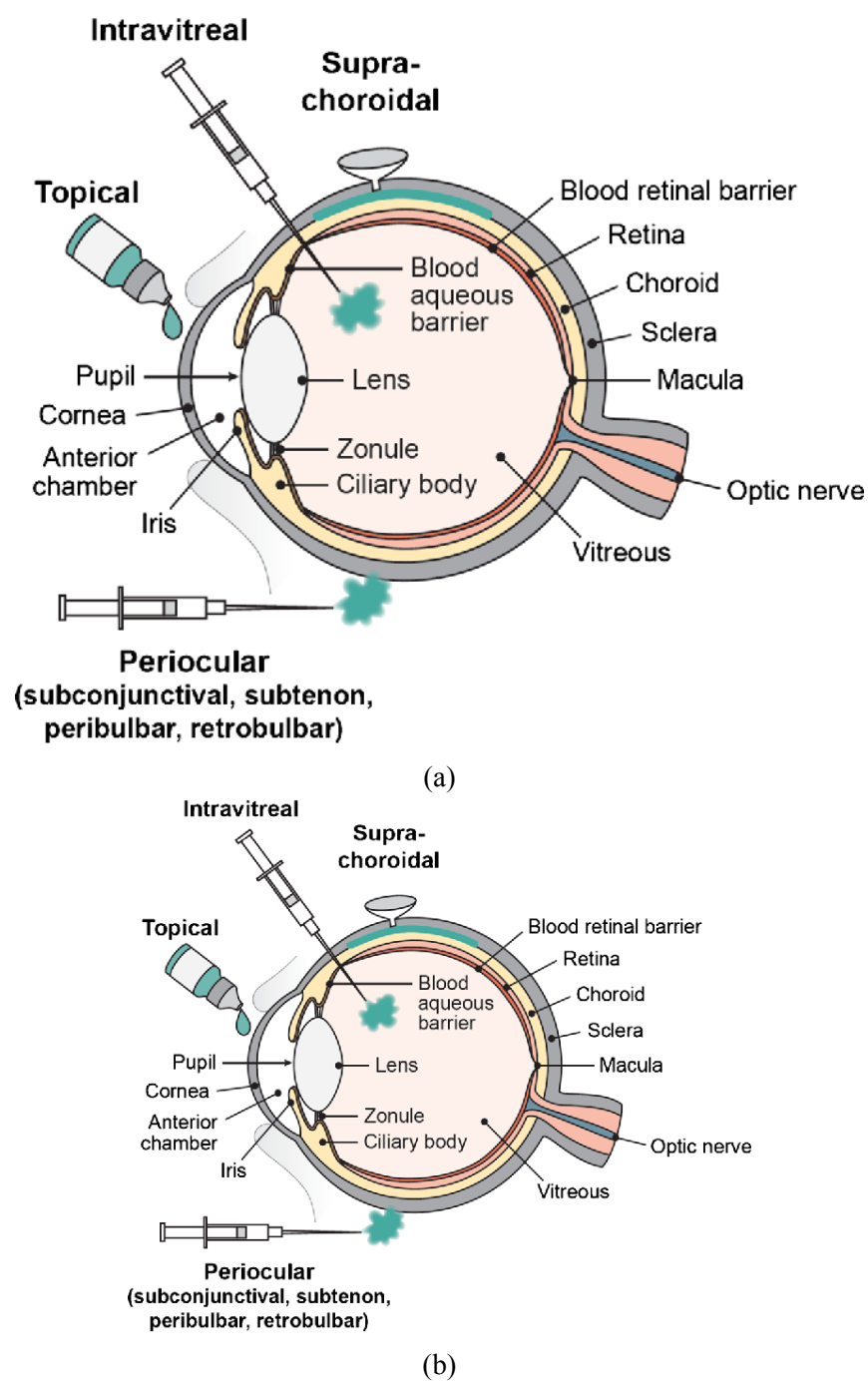


Figure 1.1: Example to load figure [1.1\(b\)](#)

CHAPTER 2

Chapter2 Title

CHAPTER 3

Chapter3 Title

CHAPTER 4

Chapter4 Title

CHAPTER 5

Conclusions

Bibliography

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APPENDIX **A**

A.1 Eye Anatomy

The human eye is a highly complex and delicate organ divided into two main segments: the anterior and posterior segments.

About Author

XXXXXX is a Senior Research Scholar in the Department of Mechanical Engineering at the Indian Institute of Technology (Indian School of Mines), Dhanbad.

Research Achievements

Journal Articles

1. Journal 1
2. Journal 2

Conference Proceedings

1. Conference 1
2. Conference 2

Book Chapters

1. Book 1
2. Book 2

Awards

1. Awards

Patents Filed

1. Indian Patent Application No: xxxxx
XXXXX Title
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