Finite Element Modeling Of Lens Deposition Using Sysweld

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Cyprien Rusu - The Finite Element Method 101 | Podcast #5 Finite Element Modeling Of Lens

How the Finite Element Method (FEM) Enhances Optical Lens Design and Analysis Optical lenses are vital components to the manufacturing and labeling of goods. For example, optical lenses are found in electronic devices like smartphones and laptops. They ’ re also used to make logos and graphics on hardware as well as other kinds of markings ...

How the Finite Element Method (FEM) Enhances Optical Lens ...

finite element model for the LENS (Laser Engineered Net Shaping) process using SYSWELD. Once amodel has been developed and improved, it will be studied to determine the effects ofvarious parameters on residual stresses, distortion, and ultimately part quality. In addition, a series offinite element models were developed to illustrate the

Finite element modeling of LENS deposition using SYSWELD

“ FINITE ELEMENT MODELLING ” When fitting soft contact lenses, it is impossible to visualise the tear layer below the lens in white light. In addition, be-ing permeable, soft lenses absorbs normal fluorescein and use of high molecular fluorescein is not sensitive enough to identify subtle changes in fit.

FINITE ELEMENT MODELLING ” - UltraVision

complexities we have created a 3D finite element computer model of the lens. Methods: Initially, we created an anatomically-correct representative mesh of the lens. We then implemented the Stokes and advective Nernst-Plank equations, in order to model the water and ion fluxes respectively. Next we complemented the

Development of a 3D finite element model of lens ...

"Finite element modeling of soft contact lens flexure... Development of a 3D finite element model of lens ... “ FINITE ELEMENT MODELLING ” When fitting soft contact lenses, it is impossible to visualise the tear layer below the lens in white light. In addition, be-ing permeable, soft lenses absorbs normal fluorescein and use of high molecular ...

Finite Element Modeling Of Lens Deposition Using Sysweld

To encapsulate these complexities we have created a 3D finite element computer model of the lens. Methods Initially, we created an anatomically-correct representative mesh of the lens. We then...

(PDF) Development of a 3D finite element model of lens ...

Through the use of Finite Element Modelling, it is now possible to pre- dict the t of a particular soft contact lens design on a speci c, indi vidual eye shape and examine the effects of changes...

(PDF) Finite Element Modelling of Soft Contact Lenses on Eye

Abstract. When fitting soft contact lenses, it is impossible to visualise the tear layer below the lens in white light. In addition, being permeable, soft lenses absorbs normal fluorescein and use of high molecular fluorescein is not sensitive enough to identify subtle changes in fit. This study provides a software tool based on a Finite Element Model of the human eye, developed over a period of more than 15 years at both Dundee University and Liverpool University, that can demonstrate the ...

Finite Element Modelling of Soft Contact Lenses on Eye ...

FINITE ELEMENT MODELING OF BINARY ACOUSTIC FRESNEL LENSES Shiu C. Chan, Mani Mina, S.S. Udpa, W. Lord, L. Udpa and T. Xue Department of Electrical Engineering and Computer Engineering Iowa State University Ames, IA 50011 INTRODUCTION Binary acoustic Fresnel lenses (BAFLs) have recently emerged as possible

Finite Element Modeling of Binary Acoustic Fresnel Lenses
The finite element method is the most widely used method for solving problems of engineering and mathematical models. Typical problem areas of interest include the traditional fields of structural analysis, heat transfer, fluid flow, mass transport, and electromagnetic potential. The FEM is a particular numerical method for solving partial differential equations in two or three space variables. To solve a problem, the FEM subdivides a large system into smaller, simpler parts that are called fini

Finite element method - Wikipedia
We used finite element analysis (ANSYS) to investigate the shape change of SCL placed on eye. We transferred the output as sixteenth order even polynomials into a ray-tracing program (Zemax) to evaluate the optical performance of the pre-flexed and post-LFE SCL. ... Arthur Ho and Simon Evans "Finite element modeling of soft contact lens flexure ...

Finite element modelling of soft contact lens flexure and ...
by internal pressure on the lens capsule In the finite element model, the edges along the coordinate planes were given rolling boundary conditions, ie constrained to move along the plane 3 Results and discussion The pressure exerted by the lens on the lens ⋯ 3D Finite Element Model for Writing Long-Period Fiber ...

[DOC] Finite Element Modeling Of Lens Deposition Using Sysweld
Abstract. Binary acoustic Fresnel lenses (BAFLs) have recently emerged as possible replacements for spherical lenses for applications in acoustic microscopy. BAFLs are surface relief structures that are relatively easy to manufacture compared to conventional spherical lenses. While the latter requires careful grinding and polishing, the former can be easily fabricated to sub-micron dimension accuracy using existing VLSI etching technology.

Finite Element Modeling of Binary Acoustic Fresnel Lenses ...
In an effort to understand the thermal behavior of the LENS process, in-situ high-speed thermal imaging has been coupled with microstructural analysis and finite-element modeling. Cooling of the melt is accomplished primarily by conduction of heat through the part and substrate, and depending on the substrate temperature and laser-input energy, cooling rates can be varied from 10 2 K s − 1 to ...

Investigating Solidification with the Laser-Engineered Net ...
Our first generation 3D finite element model of lens structure and function describes ion and fluid dynamics in the mouse lens. We chose to model the mouse lens as ion and fluid dynamics have been extensively studied in this species [3,4,15,16]. We also believe the model is an essential first step towards creating a comprehensive model of the human lens.

Development of a 3D finite element model of lens ...
An axisymmetric finite element implementation of a previously described structural constitutive model for the human lens capsule (Burd in Biomech Model Mechanobiol 8(3):217 – 231, 2009) is presented. This constitutive model is based on a hyperelastic approach in which the network of collagen IV within the capsule is represented by an irregular hexagonal planar network of hyperelastic bars, embedded in a hyperelastic matrix.

Finite element implementation of a multiscale model of the ...
Using new geometric information on the shape of the lens that has recently become available, a finite element model has been developed in order to estimate the forces that act on the lens during accommodation for a typical 29-year-old human eye. To investigate the influence of the anterior, posterior and central zonular fibres insertion regions, three models with different configurations were built.

Estimating the external force acting on the human eye lens ...
This study adopted finite element modeling to analyze the contact stress between RGP contact lens and an elderly person ’ s cornea. The RGP-lens-produced stress concentration at the corneal edge and maximum pressure on the cornea of elderly subjects aged >64 years was 104.140 kPa, but only 86.889 kPa for the 15 – 64 group.

The Most Complete, Up-to-Date Coverage of the Finite Element Analysis and Modeling of Antennas and Arrays Aimed at researchers as well as practical engineers—and packed with over 200 illustrations including twenty-two color plates—Finite Element Analysis of Antennas and Arrays presents: Time- and frequency-domain formulations and mesh truncation techniques Antenna source modeling and parameter calculation Modeling of complex materials and fine geometrical details Analysis and modeling of narrowband and broadband antennas Analysis and modeling of infinite and finite phased-array antennas Analysis and modeling of antenna and platform interactions Recognizing the strengths of other numerical methods, this book goes beyond the finite element method and covers hybrid techniques that combine the finite element method with the finite difference time-domain method, the method of moments, and the high-frequency asymptotic methods to efficiently deal with a variety of complex antenna problems. Complemented with numerous examples, this cutting-edge resource fully demonstrates the power and capabilities of the finite element analysis and its many practical applications.

It is with great pleasure that we present to you a collection of over 200 high quality technical papers from more than 10 countries that were presented at the Biomed 2008. The papers cover almost every aspect of Biomedical Engineering, from artificial intelligence to biomechanics, from medical informatics to tissue engineering. They also come from almost all parts of the globe, from America to Europe, from the Middle East to the Asia-Pacific. This set of papers presents to you the current research work being carried out in various disciplines of Biomedical En- neering, including new and innovative researches in emerging areas. As the organizers of Biomed 2008, we are very proud to be able to come-up with this publication. We owe the success to many individuals who worked very hard to achieve this: members of the Technical Committee, the Editors, and the Inter- tional Advisory Committee. We would like to take this opportunity to record our thanks and appreciation to each and every one of them. We are pretty sure that you will find many of the papers illuminating and useful for your own research and study. We hope that you will enjoy yourselves going through them as much as we had enjoyed compiling them into the proceedings. Assoc. Prof. Dr. Noor Azuan Abu Osman Chairperson, Organising Committee, Biomed 2008

Laser Engineered Net Shaping (LENS) is a rapid-manufacturing procedure that involves complex thermal, mechanical, and metallurgical interactions. The finite element method (FEM) may be used to accurately model this process, allowing for optimized selection of input parameters, and, hence, the fabrication of components with improved thermo-mechanical properties. In this study the commercial FEM code SYSWELD ® is used to predict the thermal histories and residual stresses generated in LENS-produced thin plates of AISI 410 stainless steel built by varying the process parameters laser power and stage translation speed. The computational results are compared with experimental measurements for validation, and a parametric study is performed to determine how the thermo-mechanical properties vary with these parameters. Thermal calculations are also performed with the code ABAQUS ® to evaluate its potential use as a modeling tool for the LENS process.

These Proceedings, consisting of Parts A and B, contain the edited versions of most of the papers presented at the annual Review of Progress in Quantitative Nondestructive Evaluation held at Snowmass Village, Colorado on July 31 to August 4, 1994.

The crystalline human lens is modeled by using the finite element software, ABAQUS/CAE Version 6.5-1 as an axisymmetric shell to study the optical power and displacement of anterior and posterior poles induced due to zonule traction. Several different element types were tested to obtain the optimum mesh. These elements were three and six-noded triangular hybrid and four-noded quadrilateral hybrid for modeling of the cortex and nucleus. Constant strain triangular and regular quadrilateral elements were examined for modeling the capsule. One dimensional two degree of freedom spring elements were used to model the anterior, posterior, and equatorial zonules. Six different lens profiles were selected to mathematically model the lens geometry, which included Lizak; Krueger A; Krueger B; Strenk A; Strenk B; and Trial lens. A displacement-based incremental loading history was applied to the equatorial zonule to conduct geometric nonlinear analysis. The converged solution was obtained by coupling Hilbert L-2 norm and equating external work done to internal system strain energy. The converged and optimum solution was compared with analytical solution reported in literature and was selected to conduct a comprehensive parametric study. (Abstract shortened by UMI.).