List of Completed Master's Topics

Optical Engineering Thesis

Study of Surface Plasmon Resonance in Metal and Alloy nanofilms using Maxwell Description and Metamaterial Simulation in COMSOL
by Heesoo Park
M.S. (OE) Thesis Dual Degree with Seoul Tech Univ.: supervisor: Dr. Azad Siahmakoun

Increasing the Sensitivity of the Michelson Interferometer through Multiple Reflection
by Woonghee Young
M.S. (OE) Thesis Dual Degree with Seoul Tech Univ: supervisor: Dr. Charles Joenathan

The Preparation and Experimental Verification of a Photonics Switch with Series Connected SOAs Integrated onto a Single Device
by Michael E. Plascak
M.S. (OE) Thesis: supervisor: Dr. Azad Siahmakoun

Study of Laser Speckle Scattering in Vitreous Humor Models
by Wanseok Oh
M.S. (OE) Thesis Dual Degree with Seoul Tech Univ: supervisor: Dr. Charles Joenathan

A Study on Development and Evaluation of Accuracy for the Spherical Coordinate 3D Scanning System
by Sangwook Park
M.S. (OE) Thesis Dual Degree with Seoul Tech Univ: supervisor: Dr. Sergio Granieri

Quantitative Data Extraction using Spatial Fourier Transform in Inversion Shear Interferometer
by Yanzeng Li
M.S. (OE) Thesis: supervisor: Dr. Scott Kirkpatrick

A Study of Scattering Characteristics for Micro-scale Rough Surface
by Yonghee Won
M.S. (OE) Thesis Dual Degree with Seoul Tech Univ: supervisor: Dr. Robert Bunch

Fabrication and Characterization of Edge-Emitting Semiconductor Lasers
by Junyeob Song
M.S. (OE) Thesis Dual Degree with Seoul Tech Univ: supervisors: Drs. Paul Leisher/ Wongjon Joo

Calculation and Experimental Verification of Longitudinal Spatial Hole Burning in High-Power
by Ting Hao
M.S. (OE) Thesis: supervisor: Dr. Paul Leisher

Improvement of Performance and Design Parameters Analysis for Enhancing Resolution in an Atmospheric Scanning Electron Microscope (ASEM)
by Yeohun Yoon
M.S. (OE) Thesis: supervisor: Dr. Wonjong Joo, Seoultech, South Korea
All-Optical Sigma-Delta Modulator for Analog-to-Digital Conversion
by Bin Zhang
M.S. (OE) Thesis: supervisor: Dr. Sergio Granieri

Product Development of the Optical Subsystem of a Biomedical Device
by Andrew Boneff
M.S. (OE) Thesis: supervisor: Dr. Robert Bunch

RF Vector Modulator using 8-tap Optical Hilbert Transformer
by Ryand Tucker
M.S. (OE) Thesis: supervisor: Dr. Azad Siahmakoun

Evolution of Surface Structures via Ultrashort Pulse Processing
by Jessica Wittig
M.S. (OE) Thesis: supervisor: Dr. Galen Duree, Jr.

Photonic Asynchronous Delta-Sigma Modulation
by Erin Reeves
M.S. (OE) Thesis: supervisor: Dr. Azad Siahmakoun

A Photonic Analog-to-Digital Convertor Based on Delta-Sigma Modulation
by Yiye Jin
M.S. (OE) Thesis: supervisor: Dr. Azad Siahmakoun

Measurements of Optical Nonlinearities Using a Nanosecond White Light Continuum
by Tyler Masterson
M.S. (OE) Thesis: supervisor: Dr. Robert Bunch

High Speed Optical Accumulator for a High Speed Delta Sigma Optical Analog to Digital Converter
by Aaron Cole
M.S. (OE) Thesis: supervisor: Dr. Azad Siahmakoun

Wideband Photonic RF Phase Shifter
by Alex Mulvihill
M.S. (OE) Thesis: supervisor: Dr. Azad Siahmakoun

High Speed All-Optical Digital-to-Analog Conversion
by Christopher Dapkus
M.S. (OE) Thesis: supervisor: Dr. Azad Siahmakoun

The Design and Characterization of MEMS Interferometric Sensing
by Ryan Snyder
M.S. (OE) Thesis: supervisor: Dr. Azad Siahmakoun

Dispersion Measurements Using Refractive and Interferometric Techniques
by Mary Ann Matthew
M.S. (OE) Thesis: supervisor: Dr. Robert Bunch

Hysteretic Bistable Device for All-Optical Analog-to-Digital Conversion
Detection and Measurement of Ultra-Short Pulsed Laser-Induced Filaments in Air
by Ken Meyer
M.S. (OE) Thesis: supervisor: Dr. Galen Duree, Jr.

Sensing Liquid Levels and Measuring the Contact Angles Using Optical Techniques
by Huiyong Liu
M.S. (OE) Thesis: supervisor: Dr. Robert Bunch

Fluorescence Correlation Spectroscopy of Asphaltenes
by Marc Schneider
M.S. (OE) Thesis: supervisor: Dr. Sudipa Mitra-Kirtley

Optical Bistability of Semiconductor Optical Amplifier in a Fiber Ring
by Seifu Teferra
M.S. (OE) Thesis: supervisor: Dr. Azad Siahmakoun

Optimization of Chirped Photorefractive Gratings in LiNb03Fe
by Vivek Jeevan
M.S. (OE) Thesis: supervisor: Dr. Galen Duree

Polymer Waveguide-based Short Distance Optical Interconnects
by Kamal Yadav
M.S. (OE) Thesis: supervisor: Dr. Azad Siahmakoun

A Novel Approach to Undersampling for Analog-to-Digital Conversion Using Optical Differential with a Photorefractive BaTi03 Crystal
by Noah Bock
M.S. (OE) Thesis: supervisor: Dr. Azad Siahmakoun

Characterization and Construction of an Optical Tweezers System
by Christina Bauer
M.S. (OE) Thesis: supervisor: Dr. Robert Bunch

Fabrication of Multiple Fiber Braggs Gratings on Single-Mode Fiber Using One Phase-Mask
by Nigel Sayers
M.S. (OE) Thesis: supervisor: Dr. Azad Siahmakoun

Fabrication and Characterization of Holographic Optical Elements Recorded on Silver Halide Materials for the Design of and Achromatic Fourier Processor
by John G. Smith
M.S. (OE) Thesis: supervisor: Dr. Robert Bunch

Design and Implementation of a Laser Rangefinder/Designator Beam Metrology System for Beam Characteristic Analysis Through Environmental and Atmospheric Conditions
by Chris Middlebrook
M.S. (OE) Thesis: supervisor: Dr. Robert Bunch
Applied Optics Thesis

Spectroscopic Instrument Controls and Calibration
by Zhan Chen
M.S. (AO) Thesis: supervisor: Dr. Robert Bunch

Two Simultaneous Independent RF Beams Optical Beamformer
by Mark Jaeger
M.S. (AO) Thesis: supervisor: Dr. Azad Siahmakoun

Chirped Photorefractive Grating in LiNbO₃: Fe Crystal
by Nadin Roesler
M.S. (AO) Thesis: supervisor: Dr. Azad Siahmakoun

Fiber Optic Beamformer with Programmable Binary True Time Delay Matrix at 1310nm
by Sean Durrant
M.S. (AO) Thesis: supervisor: Dr. Azad Siahmakoun

Fiber Bragg Grating: Theory and Fabrication
by Yongbin Lin
M.S. (AO) Thesis: supervisor: Dr. Robert M. Bunch

Polarization-independent Two-channel MUX/DEMUX using a Photorefractive Lithium Niobate Crystal
by Martin Nagel
M.S. (AO) Thesis: supervisor: Dr. Azad Siahmakoun

An Investigation of Electrical Fixing and Coercive Field Measurement in a Photorefractive SBN:60 Crystal
by Safoora Sedigh Sarvestani
M.S.(AO) Thesis: supervisor : Dr. Azad Siahmakoun

A Digital Method for Real-Time Autofocusing of a Microscope
by Chad Gerard Macy
M.S.(AO) Thesis: supervisor : Dr. Charles Joenathan

Design and Assembly of Pulsed Ruby Laser ESPI with Contrast Fringe Enhancement Using Digital Image Processing
by Paul Michael Jeatran
M.S.(AO) Thesis: supervisor : Dr. Arthur B. Western

Resonant Fluorescence Quenching by CS2 and Asphaltene Molecular Size and Structure Analysis by Fluorescence Anisotrophy
by Henning Gronzin
M.S.(AO) Thesis: supervisor : Dr. Sudipa M. Kirtley

Temperature Controlled Two-Beam Coupling and Phase Conjugation at 1.32 um in Photorefractive InP:Fe
by Dirk Jurgens
M.S.(AO) Thesis: supervisor : Dr. Azad Siahmakoun

A Fiber Optic Sensor for Measuring the Vibration Frequency of Reflective Surface
by Jingbo Cai
M.S.(AO) Thesis: supervisor : Dr. Robert M. Bunch

**Tracking Photorefractive Microscope**
By Torsten Blaetter
M.S.(AO) Thesis: supervisor : Dr. Azad Siahmakoun

**Ultraviolet, Visible, and Near-Infrared Laser-Induced Fluorescence of Limestone**
by Joseph R. Bezouska
M.S.(AO) Thesis: supervisor : Dr. Sudipa M. Kirtley

**The effects of Optical Aberrations on Photolithographic Processes**
by Jianhua Li
M.S.(AO) Thesis: supervisor : Dr. Jerome Wagner

**Phase Unwrapping by Neural Network**
by Rongguang Liang
M.S.(AO) Thesis: supervisor : Dr. Michael F. McInerney

**Fabrication and Testing of a Photorefractive Polymer Composite**
by Andres Heidebrecht
M.S.(AO) Thesis: supervisor : Dr. Azad Siahmakoun

**Detection of Defects in Plastic Film and on Wood Board by Machine Vision Inspection**
by Xiaoye Xi
M.S.(AO) Thesis: supervisor : Dr Brij Khorana

**Application of Magneto-optic Kerr Techniques for Domain Observation in Transformer Steel (SiFe)**
by Bryan E. Hall
M.S.(AO) Thesis: supervisor : Dr. Jerome Wagner

**Characterizations and Applications of Boulder Nonlinear System Spatial Light Modulator**
by Wei Li
M.S.(AO) Thesis: supervisor : Dr. Robert M. Bunch

**Measurement of In-Plane Displacement by Speckle Photography with Fourier Filtering**
by James David Walls
M.S.(AO) Thesis: supervisor : Dr. Arthur B. Western

**Design and Construction of a Stellar Photometer**
by Jorg Wiedmann
M.S.(AO) Thesis: supervisor : Dr. Richard Ditteon

**Optical Tomography of Human Tooth**
by Igor R. Vinogradov
M.S.(AO) Thesis: supervisor : Dr. Brij Khorana

**Design of a Frequency-Selective Fiber Optic Vibration Sensor**
by Chandra Sekhar Kakani
M.S.(AO) Thesis: supervisor : Dr. Robert M. Bunch
Development of a Fiber Optic Absorption-Based Chemical Sensor  
by Laura Leanne Tougaw  
M.S.(AO) Thesis: supervisor : Dr. Robert M. Bunch

Application of Dynamic Speckle in Tooth Diagnostics  
by Vladimir G. Krylov  
M.S.(AO) Thesis: supervisor : Dr. Brij Khorana

An Investigation of Self-focusing and Self-defocusing in a Photorefractive SBN Crystal  
by Detlef Breitling  
M.S.(AO) Thesis: supervisor : Dr. Azad Siahmakoun

The Optical Component Design for a Biomedical Endoscope  
by Aaron Barr  
M.S.(BE) Thesis: supervisor : Dr. Brij Khorana

Study of the Photorefractive Phase Shift in a BaTiO3 Crystal using an Interferometric Technique  
by Jürgen Rainer Spielvogel  
M.S.(AO) Thesis: supervisor : Dr. Azad Siahmakoun

Genetic Algorithm for Optical System Optimization  
by Jeffrey Kwok  
M.S.(AO) Thesis: supervisor: Dr. Richard Ditteon

Simple Geometric Shape Recognition by Genetic Algorithms  
by Allen Jin Yuan  
M.S(AO) Thesis: supervisor: Dr. Michael F. McInerney

Investigation of the Temporal Behavior of a Semi-Linear Photorefractive Resonator  
by Gerd Klose  
M.S.(AO) Thesis: supervisor: Dr. Azad Siahmakoun

Digital Image Processing Algorithm Development for Segmentation and Classification of Nuclear Particle Tracks in Lexan Slides  
by Douglas E. Childers  
M.S.(AO) Thesis: supervisor: Dr. Robert M. Bunch

Novel Techniques for Wavefront Shearing in ESPSI Using Diffraction Gratings  
by Lutz Burkle  
M.S.(AO) Thesis: supervisor: Dr. Charles Joenathan

Increased Sensitivity to In-Plane Displacements in Electronic Speckle Pattern Interferometry  
by Alexander Matthias Sohmer  
M.S.(AO) Thesis: supervisor: Dr. Charles Joenathan

Microlensed Fiber Optic Confocal Microscope Probe  
by Randy Lee Gove  
M.S.(AO) Thesis: supervisor: Dr. Robert M. Bunch

Study of Induced Photothermal Phase Variations in ZrSiO2 Anti-reflection Coating Using a
Photorefractive Schlieren System
by Paul Wayne Southard
M.S.(AO) Thesis: supervisor: Dr. Azad Siahmakoun

Dispersion Measurement Systems for Optical Fibers
by Fei Shen
M.S.(AO) Thesis: supervisor: Dr. Robert M. Bunch

Dynamic Laser Speckle Studies of Botanical Specimens
by Zijie Xu
M.S.(AO) Thesis: supervisor: Dr. Brij M. Khorana

Incorporating a 1550 NM Laser Diode in a Fiber Optic ESPI System
by Christopher Orcutt
M.S.(AO) Thesis: supervisor: Dr. Charles Joenathan

Optical Phase-conjugate Shear Interferometer with Multiple Wavelengths in Photorefractive Medium
by Konstantine Yurievich Kos
M.S.(AO) Thesis: supervisor: Dr. Azad Siahmakoun

Automated Detection of Surface Defects
by Pyotr Shmelev
M.S.(AO) Thesis: supervisor: Dr. Brij M. Khorana

A Study of Dichromated Gelatin and the Construction of Holographic Optical Elements
by Jay E. Sharping
M.S.(AO) Thesis: supervisor: Dr. Charles Joenathan

Projection Moire Contouring System for Testing F/0.1 Plastic Parabolic Reflectors
by Andrew Harrison Fagg
M.S.(AO) Thesis: supervisor: Dr. H. Philip Stahl

Design and Calibration of a Two-Channel Ronchi System to Contour a Dynamic Fluid Surface
by William Stephen Meyers
M.S.(AO) Thesis: supervisor: Dr. H. Philip Stahl

Direct Fabrication and Testing of Fiber Optic Microlenses
by Eric A. Roth
M.S.(AO) Thesis: supervisor: Dr. R. M. Bunch

A Hybrid-Photorefractive Character-Recognition System
by Thomas Harrer
M.S.(AO) thesis; supervisor: Dr. A. Siahmakoun

A Fiber Optic ESPI System Using Diode Laser
by Song Peng
M.S.(AO) thesis; supervisor: Dr. B.M. Khorana

Surface Characterization of Aluminized Parabolic Reflectors Using Light Scattering Techniques
by Randall Lee Ecklar  
M.S.(AO) thesis; supervisor: Dr. R. M. Bunch

**Design of Lenses Dominated by Third-Order Aberrations**  
by Zhong Xie  
M.S.(AO) thesis; supervisor: Dr. J. F. Wagner

**Holographic Interferometric Study of the Human Cardiac System**  
by Glen Brown  
M.S.(AO) thesis; supervisor: Dr. A. B. Western

**Time-Integrating Self-Pumped Phase Conjugator**  
by Erik Oldekop  
M.S.(AO) thesis; supervisor: Dr. A. Siahmakoun

**Studies of Wavelength Dependent Loss Effects in Optical Fiber Components and Sensors**  
by Sami D. Al-Aruri  
M.S.(AO) thesis; supervisor: Dr. R. M. Bunch

**Lens for Microlithography**  
by Hung-yu Hsieh  
M.S.(AO) thesis; supervisor: Dr. J. F. Wagner

**Phase-Conjugate Shear-Interferometer**  
by Guanglu Yang  
M.S.(AO) thesis; supervisor: Dr. A. Siahmakoun

**Part 1: "Y-Y Diagram for the Axial Gradient"**  
**Part 2: "Design of the Nonlens"**  
by Michael R.L. Coon  
M.S.(AO) thesis; supervisor: Dr. R. Ditteon

**Energy Losses in a Dielectric-Metal Slab Waveguide System**  
by Danjin Wu  
M.S.(AO) thesis; supervisor: Dr. J. F. Wagner

**Veiling Glare in the F4111 Image Intensifier**  
by Mukund Acharya  
M.S.(AO) thesis; supervisor: Dr. R. M. Bunch

**Enhancement of Fringe Visibility with Photorefractive Processor**  
by Markus R. Weiss  
M.S.(AO) thesis; supervisor: Dr. A. Siahmakoun

**Forward Light Scattering From Optical Fibers**  
by Seungug Koh  
M.S.(AO) thesis; supervisor: Dr. R. M. Bunch

**Noninvasive Study of Human Cardiac Cycle Using Holographic Interferometry**  
by Daniel T. English  
M.S.(AO) thesis; supervisor: Dr. A. B. Western
Optical Nondestructive Testing of Metallic Honeycomb Bonding
by Brian W. Eliason
M.S.(AO) thesis; supervisor: Dr. A. B. Western

Prototype Right Angle Fiber Optic Connector and Bend Loss of Optical Fibers
by Roger S. Cannon
M.S.(AO) thesis; supervisor: Dr. R. M. Bunch

Measurement of Static Displacements Using Digital Speckle Pattern Interferometry and Image Processing
by Christopher L. Eichelberger
M.S.(AO) thesis; supervisor: Dr. B. M. Khorana

Characterization of heat-treated Photorefractive Crystal BaTiO3
by Yuh-Kuan Ding
M.S.(AO) thesis; supervisor: Dr. A. Siahmakoun

Integration of a Laser Diode into a Digital Speckle Pattern Interferometer
by Erhard Krumpholz
M.S.(AO) thesis, Part II; supervisor: Dr. B. M. Khorana

Characterization of and Coupling into Thin Dielectric Films
by Erhard Krumpholz
M.S.(AO) thesis, Part I; supervisor: Dr. J. F. Wagner

Angularly Polished Optical Fibers and their Application to Right-Angle Connectors
by Joseph P. Caughey
M.S.(AO) thesis; supervisor: Dr. R. M. Bunch

Characterization of Radiation Loss from Formed 90° Bends in Optical Fibers
by Dirk A. Hall
M.S.(AO) thesis; supervisor: Dr. R. M. Bunch

Displacement Measurement by Holographic Interferometry and Comparison with Speckle Methods
by Sean C. Lee
M.S.(AO) thesis; supervisor: Dr. R. D. Bahuguna

The Development of an Improved ESPI System
by Jon S. Edmondson
M.S.(AO) thesis; supervisor: Dr. B. M. Khorana

Modeling Interference and Diffraction Effects in Photolithography
by Stephen D. Horchem
M.S.(AO) thesis; supervisor: Dr. J. F. Wagner