# VINAY V. ALEXANDER

# **Education**

UNIVERSITY OF MICHIGAN, ANN ARBOR, MI	
• PH.D. ELECTRICAL ENGINEERING (OPTICS) Electrical Engineering Departmental Fellowship GPA: 3.91/4.0	AUG 2013
• M.S. ELECTRICAL ENGINEERING GPA: 3.9/4.0	Apr 2008
• <b>B.S. ELECTRICAL ENGINEERING</b> Summa Cum Laude Dean's list, all semesters GPA: 3.88/4.0	DEC 2005
CHARTERED FINANCIAL ANALYST (CFA) LEVEL 2 CANDIDATE Work Experience	JAN 2011
MCKINSEY & COMPANY - DETROIT, MI • First year Advanced Professional Degree (APD) Associate	Aug 2013 - Present
SOLID STATE ELECTRONICS LAB & MEDICAL SCHOOL - UNIVERSITY OF MICHIGAN, ANN ARBOR, MI Ph.D. Candidate	SEP 2006- Aug 2013
<ul> <li>Developed novel high power all-fiber infrared laser sources for defense, healthcare and metrology applications</li> <li>Built laser prototype and performed spectroscopy field trials at the Air Force Research Labs (Wright Patterson Air Force Base)</li> <li>Built laser catheter and performed live animal trials in sheep investigating treatments for hypertension</li> <li>Developed laser treatments for acne by thermally modifying sebaceous glands in human skin ex vivo</li> <li>Developed laser treatments for myopia by thermally modifying the corneal shape in porcine/bovine eyes in vitro for the necessary refractive corrections</li> <li>Authored and co-authored over 10 technical papers in top-tier peer reviewed archival journals and conferences</li> </ul>	
<ul> <li>OMNI SCIENCES, INC – DEXTER, MI Optical Engineer Intern</li> <li>Built mid infrared commercial laser prototype based on Ph.D. research</li> <li>Designed and built high power optical coupling component specifically for the prototype</li> <li>Live demonstration of prototype to various sponsors</li> </ul>	Jun-Aug 2011
<ul> <li>COHERIX, INC – ANN ARBOR, MI Engineering Research Investigator - Graduate Student Project</li> <li>Designed and built table-top prototype for a laser based surface roughness measurement system</li> <li>Collaborated with industry experts developing metrology tools for automotive parts</li> <li>Performed market study and value proposition for developed technique</li> <li>Archival journal publication and conference presentation on prototype design and results</li> </ul>	Jun-Oct 2009

### **Teaching Experience**

#### UNIVERSITY OF MICHIGAN, ANN ARBOR, MI

Graduate Student Instructor

- Taught labs on circuit fundamentals 2-3 times a week to classes of 20 students each
- Prepared homework and lab solutions for student reference
- Encouraged teamwork while stressing on importance of academic integrity

## **Technical Skills**

- Laser system solutions, design, assembly, development and characterization
- Histology processing, cryostat and paraffin fixing, sectioning, familiar with various staining protocols
- Optical system design using **Zemax**
- Writing complex simulations in C++, Matlab, Mathematica
- Automation and information processing using Labview
- Pulsed laser deposition and X-Ray diffraction analysis
- High speed electronic circuit board design using Cadence and ADS tools

## Business Coursework

• Accounting

- Financial Statement Analysis
- Financing Entrepreneurial Commercialization

## **Publications**

#### **Archival Refereed Journals**

- [1] <u>V.V. Alexander</u> et al," Field Trial of Active Remote Sensing Using A High Power Short Wave Infrared Supercontinuum Laser," *Appl. Opt*, 52, 6813-6823, 2013.
- [2] <u>V. V. Alexander</u> et al, "Power scalable >25W supercontinuum laser from 2-2.5 μm with near diffraction limited beam and low output variability," *Opt. Lett.*, 38, 2292-2294, 2013. *Selected for Spotlight on Optics issue by the Optical Society of America (OSA)*.
- [3] <u>V.V. Alexander</u> et al, "Modulation Instability Initiated High Power All-Fiber Supercontinuum Lasers and Their Applications," *Opt. Fiber Technol*, 18, 5, 349-374, 2012. *Invited Paper*.
- [4] <u>V.V. Alexander</u> et al, "Photothermolysis of Sebaceous Glands in Human Skin Ex Vivo with a 1,708 nm Raman Fiber Laser and Contact Cooling," *Lasers Surg. Med*, 43, 470-480, 2011. *Article and image featured on cover* of journal issue.
- [5] <u>V.V. Alexander</u> et al, "Surface roughness measurement of flat and curved machined metal parts using a near infrared super-continuum laser," *Opt. Eng*, 50, 113602, 2011.
- [6] O.P. Kulkarni, <u>V.V. Alexander</u> et al, "Supercontinuum generation from ~1.9 to 4:5 μm in ZBLAN fiber with high average power generation beyond 3:8 μm using a thulium-doped fiber amplifier. *J. Opt. Soc. Am. B*, 28, 2486-2498, 2011.
- [7] M. Kumar, C. Xia, X. Ma, <u>V.V. Alexander</u> et al, "Power Adjustable Visible Supercontinuum Generation using Amplified Nanosecond Gain Switched Laser Diode," *Opt. Exp*, 16, 6194-6201, 2008.

#### **Conference Presentations**

- J. Meola, A. Absi, J.D. Leonard, A. Ifarraguerri, M.N. Islam, <u>V.V. Alexander</u>, Jerome Zadnik, "Modeling, development, and testing of a shortwave infrared supercontinuum laser source for use in active hyperspectral imaging, SPIE Proceedings Vol. 8743, 2013.
- [2] O.P. Kulkarni, <u>V.V. Alexander</u> et al, "Mid-IR Supercontinuum (SC) Generation in ZBLAN fiber pumped by Tm-doped Amplifier with Fused Silica SC Input," *Conference on Lasers & Electro-Optics 2011*, Baltimore, Maryland.
- [3] <u>V.V. Alexander</u> et al, "Non-Contact Surface Roughness Measurement of Crankshaft Journals Using a Supercontinuum Laser," *Conference on Lasers & Electro-Optics 2010*, San Jose, California.
- [4] M. Kumar, C. Xia, X. Ma, <u>V.V. Alexander</u> et al, "Power Scalable Visible Supercontinuum Generation Using Amplifier Nanosecond Gain-switched Laser Diode," *Conference on Lasers & Electro-Optics 2010*, San Jose,

JAN-APR 2011 & SEP-DEC 2009 California.

- [5] C. Xia, M. Kumar, M.Y. Cheng, O.P. Kulkarni, <u>V.V. Alexander</u> et al, "0.8-4.5 Microns Supercontinuum Generation in ZBLAN Fibers Scaled up to 1.25 W Power," *Conference on Lasers & Electro-Optics 2006*, Long Beach, California.
- [6] E. Cagin, J. Siddiqui, D. Chen, S. Chua, <u>V. Alexander</u>, and J. Phillips. "Electrical properties of ferroelectric/ZnO heterojunctions". *Materials Research Society Fall Meeting* 2005, Boston, Massachusetts.

### Activities

- Tau Beta Pi Engineering Honor Society
- Eta Kappa Nu Electrical Engineering Honor Society
- IEEE & OSA student member
- MPowered Student Entrepreneurial Organization **Project manager** advertised and promoted entrepreneurial events on campus (2008)
- High Tech Club at Ross School of Business **Liaison to college of engineering** advertised and coordinated the futuretech conference (2008)
- Electrical engineering program curriculum committee **Student representative** worked with the faculty to provide feedback and improve the undergraduate curriculum (2005)

#### Languages

- Fluent in **English, Hindi and Malayalam**
- Basic in French and Arabic

**References**: Available on request

