Curriculum Vitae

Ivan T. Lima Jr., Ph.D., P.E.
Associate Professor
Department of Electrical and Computer Engineering
Biomedical Engineering Graduate Program
North Dakota State University
1411 Centennial Blvd., ECE 101E
P.O. Box 6050, NDSU Dept. 2480
Fargo, ND, 58108-6050   USA

Ivan.Lima@ndsu.edu
http://www.ndsu.edu/faculty/limajr/
http://www.ndsu.edu/labs/photonics

April 2, 2025

Education

12/2003: Ph.D. in Electrical Engineering (Photonics)
University of Maryland, Baltimore County (UMBC), Baltimore, Maryland, USA.
Dissertation: "Investigation of the performance degradation due to polarization effects in optical fiber communications systems."

03/1998: M.Sc. in Electrical Engineering (Electromagnetics)
University of Campinas (UNICAMP), Campinas, São Paulo, Brazil.
Thesis: "Analysis of the frequency selectivity of two-dimensional periodic dielectric gratings."

12/1995: B.Sc. in Electrical Engineering (Electronics)
Federal University of Bahia (UFBA), Salvador, Bahia, Brazil.

Professional Qualifications

05/30/2017 - Present: Registered Professional Engineer (P.E.), State of North Dakota, USA.
Electrical and Computer Engineering: Electronics, Controls, and Communications.
License # PE-10929

05/16/2019 - Present: Licensed Ham radio operator by the U.S. Federal Communications Commission (FCC) at the Extra class with the ability to conduct radio communications and experiments transmitting up to 1.5 kW peak envelope power in most of the radio bands allocated by the FCC for this service.
Radio call sign: ALØL

Employment

06/2010-Present: Associate Professor of Electrical and Computer Engineering (with tenure), Department of Electrical and Computer Engineering, and Biomedical Engineering Graduate Faculty, North Dakota State University, Fargo, ND, USA. Assignment: Research (10%): Biosensing, Biomedical engineering, photonics; Teaching (85%): Graduate and undergraduate courses (electric circuits, optics/photonics, and stochastic processes), advising, supervision of senior design projects, and laboratory and course development; Service (5%): Reviewer of journal papers and proposals for funding, service in university committees, and service in technical/scientific committees in technical conferences and journals.

08/2003 - 05/2010:   Assistant Professor of Electrical and Computer Engineering, Department of Electrical and Computer Engineering, North Dakota State University, Fargo, ND, USA. Assignment: Research (40%), Teaching (40%), and service (20%).

01/2011 - 12/2011:   Visiting Professor, School of Electrical and Computer Engineering, University of Campinas (UNICAMP), Campinas, SP, Brazil.

10/2008 - 08/2009:   Visiting Professor, Department of Electrical and Computer Engineering, University of Manitoba, Winnipeg, MB, Canada.

05/2007 - 10/2008:   Faculty Associate, Center for Nanoscale Science and Engineering, North Dakota State University, Fargo, ND, USA. Assignment: Research and development in distributed computer systems in the Electronic Systems Laboratory.

08/1998 - 08/2003:   Research Assistant, Computer Science and Electrical Engineering Department, University of Maryland, Baltimore County, Baltimore, MD, USA. Assignment: Research novel techniques for the mitigation of the effects that limit the capacity of single channel and wavelength-division-multiplexed optical fiber communications systems.

12/1994 - 2/1996:   Advisor (Information Technology), State Superintendence of Bahia, Bank of Brazil (Banco do Brasil), Salvador-BA, Brazil. Assignment: Analysis and development of database software. From 1993 to 1996 was serving the Presidency of the Bank.

06/1992 - 11/1994:   Assistant (Information Technology), State Superintendence of Bahia, Bank of Brazil, Salvador-BA, Brazil. Assignment: Analysis and development of database software.

06/1990 - 05/1992:   Computer Programmer, Data Processing Center, Bank of Brazil, Salvador-BA, Brazil. Assignment: Analysis and development of database software.

10/1989 - 05/1990:   Administrative Assistant, Main Branch, Bank of Brazil, Salvador-BA, Brazil. Assignment: Bank clerk.

10/1986 - 09/1989:   Office Assistant, Bank of Brazil, Araguaína-TO, Brazil.

Awards and honors

04/2024:   Nominated by the Chair of the Department of Electrical and Computer Engineering at North Dakota State University to the 2024 College of Engineering Excellence in Teaching Award.

07/2020:   Elevated to the grade of Senior Member of the SPIE: The International Society for Optics and Photonics, USA, "in recognition of significant achievements within the optics and photonics community".

09/2018:   Nominated by the Chair of the Department of Electrical and Computer Engineering at North Dakota State University to the 2018 College of Engineering Excellence in Teaching Award.

05/2017:   Elevated to the grade of Senior Member of Optica: Advancing Optics and Photonics Worldwide. USA, "for professional service accomplishments in the field of optics and photonics".

07/2009:   Elevated to the grade of Senior Member of the IEEE: Institute of Electrical and Electronics Engineers, USA, "in recognition of professional standing".

05/2006:   Faculty Fellowship in the 2006 Air Force Summer Faculty Fellowship Program to contribute to the Solid-State Laser Development Program of the Air Force Research Laboratory, Wright-Patterson Air Force Base, Ohio, USA. Period: 05/16/06 to 08/08/06.

10/27/2003:   IEEE LEOS Graduate Student Fellowship Award from the Photonics Society (formerly Lasers & Electro-Optics Society - LEOS) of the IEEE, USA, for outstanding research performance and academic achievement as a graduate student. The fellowship award was presented at the 2003 IEEE LEOS Annual Meeting (LEOS 2003) in Tucson, Arizona, USA.

09/24/2003:   Venice Summer School on Polarization Mode Dispersion Award (co-recipient) for outstanding paper published in the proceedings of the 29th European Conference on Optical Communication (ECOC 2003). The award was presented at ECOC 2003 in Rimini, Italy.

09/01/1998:   Ph.D. Graduate Scholarship from the National Research Council (CNPq) of the Brazilian Ministry of Science and Technology for graduate education at the University of Maryland, Baltimore County, Baltimore, Maryland, USA. Period: 09/1998 to 08/2000. Note: all the funds received from this scholarship were reimbursed to CNPq after immigrating to the USA.

03/01/1996:   M.Sc. Graduate Scholarship from CAPES of the Brazilian Ministry of Education for graduate education at the State University of Campinas, Campinas, São Paulo, Brazil. Period: 03/1996 to 03/1998.

Professional societies
➢ IEEE (formerly the Institute of Electrical and Electronics Engineers) - (Senior Member).
  • IEEE Photonics Society

- IEEE Engineering in Medicine and Biology Society
- ➢ Optica (formerly the OSA): Advancing Optics and Photonics Worldwide - (Senior Member).
- ➢ SPIE: The International Society for Optics and Photonics - (Senior Member).

Technical Societies
- ➢ Red River Radio Amateurs (RRRA), Fargo, North Dakota, USA - (Member)
- ➢ Amateur Radio Society (ARS), North Dakota State University, Fargo, North Dakota, USA - (Faculty Advisor)

Personal
— Citizen of the United States of America: State of Alaska and State of North Dakota.
— Citizen of Brazil: State of Bahia.

Language skills
— English: Read, write, listen, and speak fluently.
— Portuguese: Read, write, listen, and speak fluently (native).
— Spanish: Read, listen, and speak.

Hardware & software skills
— Microcontrollers: TI MSP430G2553 and AVR ATmega168.
— Languages: C++, C, Fortran 77, Matlab, dbase III, Clipper, Assembly Z-80, BASIC.
— Applications: Latex, Gnuplot, LibreOffice, Microsoft Office, LTspice, CircuitLab.
— Operating Systems: Linux (preferred) and other UNIX flavors (including Android), Windows, DOS.

Professional service
- ➢ Member of the Editorial Board of the journal Micromachines. Period: 02/2023 to Present.
- ➢ Member of the Technical Program Committee in Track HMB: "Human State Measurement and Biosensing" of the 2024 IEEE Research and Applications of Photonics in Defense (RAPID) Conference, Miramar Beach, Florida, USA, August 14-16, 2024.
- ➢ Member of the Scientific Committee of the 11th International Conference on Biomedical Engineering and Systems (ICBES'24), Barcelona, Spain, August 19-21, 2024.
- ➢ Member of the Technical Program Committee in Track HMB: "Human State Measurement and Biosensing" of the 2023 IEEE Research and Applications of Photonics in Defense (RAPID) Conference, Miramar Beach, Florida, USA, September 11-13, 2023.
- ➢ Member of the Scientific Committee of the 10th International Conference on Biomedical Engineering and Systems (ICBES'23), London, Great Britain, August 3-5, 2023.
- ➢ Member of the Technical Program Committee and co-Chair of Session 1: "Materials and Devices for Biosensing" in Track HMB: "Human State Measurement and Biosensing" of the 2022 IEEE Research and Applications of Photonics in Defense (RAPID) Conference, Miramar Beach, Florida, USA, September 12-14, 2022.
- ➢ Member of the Scientific Committee of the 9th International Conference on Biomedical Engineering and Systems (ICBES'22), Prague, Czech Republic, July 28-30, 2022.
- ➢ Member of the Technical Program Committee of the 9th International Conference on Bioimaging (BIOIMAGING 2022), Vienna, Austria, February 9-11, 2022.

- Member of a Proposal Review Panel of the National Science Foundation (NSF), Engineering Directorate (ENG), Chemical, Bioengineering, Environmental and Transport Systems (CBET) Division, Biosensing Program, October 2021.
- Member of the Technical Program Committee and Chair of Session 1: "Materials and Devices for Biosensing" in Track HMB: "Human State Measurement and Biosensing" of the 2021 IEEE Research and Applications of Photonics in Defense Conference (RAPID), Virtual Conference, Miramar Beach, Florida, USA, August 2-4, 2021.
- Member of the Editorial Board of the journal Chemosensors from 07/2019 to 09/2021.
- Member of the Scientific Committee of the 8th International Conference on Biomedical Engineering and Systems (ICBES'21), Prague, Czech Republic (Virtual Conference), July 29-31, 2021.
- Member of the Technical Program Committee of the 8th International Conference on Bioimaging (BIOIMAGING 2021), Vienna, Austria, February 11-13, 2021.
- Member of the Technical Program Committee and co-Chair of Session 1: "Materials and Devices for Biosensing" in Track HMB: "Human State Measurement and Biosensing" of the 2021 IEEE Research and Applications of Photonics in Defense Conference (RAPID), Virtual Conference, Miramar Beach, Florida, USA, August 10-12, 2020.
- Member of the Scientific Committee of the 7th International Conference on Biomedical Engineering and Systems (ICBES'20), Prague, Czech Republic (Virtual Conference), August 13-15, 2020.
- Member of the Technical Program Committee of the 7th International Conference on Bioimaging (BIOIMAGING 2020), Valetta, Malta, February 24-26, 2020.
- Member of the Technical Program Committee and co-Chair of Session 1: "Materials and Devices for Biosensing" in Track HMB: "Human State Measurement and Biosensing" of the 2019 IEEE Research and Applications of Photonics in Defense Conference (RAPID), Miramar Beach, FL, USA, August 19-21, 2019.
- Member of the Technical Program Committee of the 6th International Conference on Bioimaging (BIOIMAGING 2019), Prague, Czech Republic, February 22-24, 2019.
- Member of the Technical Program Committee and co-Chair of Session 2: "Nonlinear Materials and phenomena" in Track 2: "Materials for Advanced Photonics" of the 2018 IEEE Research and Applications of Photonics in Defense Conference (RAPID), Miramar Beach, FL, USA, August 22-24, 2018.
- Member of the Technical Program Committee of the 5th International Conference on Bioimaging (BIOIMAGING 2018), Funchal, Madeira -Portugal, January 19-21, 2018.
- Member of the Technical Program Committee of the 2017 SBMO/IEEE MTT-S International Microwave and Optoelectronics Conference (IMOC), Águas de Lindoia, SP, Brazil, August 27-30, 2017.
- Member of the Technical Program Committee of the 4th International Conference on Bioimaging (BIOIMAGING 2017), Porto, Portugal, February 21-27, 2017.
- PI and Project Director of the U.S.-Brazil Engineering Education Consortium on Renewable Energy. Objective: International exchange program of undergraduate engineering students funded by the Fund for the Improvement of Postsecondary Education (FIPSE) in the U.S. Department of Education. Period: From October 2007 to September 2012.
- Member of the Technical Program Committee of the SBMO/IEEE MTT-S International Microwave and Optoelectronics Conference, Belém, Brazil, November 3-6, 2009.

- ➢ Instructor of Short Course: "Polarization Effects in Optical Fiber Communication Systems," (invited) held in the SBMO/IEEE MTT-S International Microwave and Optoelectronics Conference, Belém-PA, Brazil, November 3-6, 2009.
- ➢ Co-instructor of short course SC210: "Hands-on polarization measurement workshop" (invited), Optical Fiber Communication Conference and Exposition (OFC) 2004, Los Angeles, California, USA, short courses SC210-A and SC210-B at OFC/NFOEC 2005, SC210 at OFC/NFOEC 2006 and OFC/NFOEC 2007, Anaheim, California, USA, SC210 at OFC/NFOEC 2008 and OFC/NFOEC 2009 and OFC/NFOEC 2010, San Diego, California, USA. Sponsored by OSA and IEEE Photonics Society.
- ➢ Member of Proposal Review Panel of the National Science Foundation (NSF) in June 2007: Electronics, Photonics, and Device Technologies (EPDT) Program, Electrical, Communications, and Cybernetic Systems (ENG/ECCS) Division.
- ➢ Chair of Session Optical Devices, Systems and Related Topics VIII session, 2009 SBMO/IEEE MTT-S International Microwave and Optoelectronics Conference, Belém, Pará, Brazil, November 3-6, 2009.
- ➢ Chair of Session Engineering Cluster, 2009 FIPSE-CAPES Annual Project Director's Meeting, Washington D.C., USA, October 18-20, 2009.
- ➢ Chair of Session Innovative Curriculum, 2007 ASEE North Midwest Section Conference, Houghton, Michigan, USA, September 20-22, 2007.

- ➢ Reviewer of technical journals:
  - MDPI Sensors
  - MDPI Brain Sciences
  - MDPI Bioengineering
  - MDPI Chemosensors
  - MDPI Micromachines
  - MDPI Applied Sciences
  - MDPI Diagnostics
  - IEEE Access
  - IEEE Journal of Lightwave Technology
  - SPIE Journal of Biomedical Optics
  - IEEE Photonics Journal
  - Optica Optics Express
  - Optica
  - Springer Optical and Quantum Electronics

Teaching experience
Dept. of Electrical and Computer Engineering, North Dakota State University, Fargo, ND, USA
Spring 2025:   ECE 311: Circuit Analysis II (4 credits)
                          Synchronous (in-person and online)
                          Online Asynchronous
                 ECE 320: Electronics I (3 credits)
                          Synchronous (in-person and online)
                          Online Asynchronous
                 ECE 321: Electronics II (2 credits)

Synchronous (in-person and online)
Online Asynchronous

Fall 2024: ECE 311: Circuit Analysis II (4 credits)
           Synchronous (in-person and online)
           Online Asynchronous
   ECE 320: Electronics I (3 credits)
           Synchronous (in-person and online)
           Online Asynchronous
   ECE 321: Electronics II (2 credits)
           Synchronous (in-person and online)
           Online Asynchronous
   ECE 341: Random Processes (3 credits)
           Synchronous (in-person and online)
           Online Asynchronous

Spring 2024: ECE 311: Circuit Analysis II (4 credits)
           Synchronous (in-person and online)
           Online Asynchronous
   ECE 320: Electronics I (3 credits)
           Synchronous (in-person and online)
           Online Asynchronous
   ECE 321: Electronics II (2 credits)
           Synchronous (in-person and online)
           Online Asynchronous

Fall 2023: ECE 311: Circuit Analysis II (4 credits)
           Synchronous (in-person and online)
           Online Asynchronous
   ECE 341: Random Processes (3 credits)
           Synchronous (in-person and online)
           Online Asynchronous

Spring 2023: ECE 311: Circuit Analysis II (4 credits)

Fall 2022: ECE 311: Circuit Analysis II (4 credits)
   ECE 421/621: Communication Circuits (3 credits)

Spring 2022: ECE 311: Circuit Analysis II (4 credits)

Fall 2021: ECE 311: Circuit Analysis II (4 credits)
   ECE 705: Stochastic Processes (3 credits)

Spring 2021: ECE 311: Circuit Analysis II (4 credits)

Fall 2020: ECE 311: Circuit Analysis II (4 credits)

ECE 705: Stochastic Processes (3 credits)

Spring 2020:   ECE 311: Circuit Analysis II (4 credits)

Fall 2019:   ECE 311: Circuit Analysis II (4 credits)
             ECE 341: Random Processes (3 credits)

Spring 2019:   ECE 311: Circuit Analysis II (4 credits)

Fall 2018:   ECE 311: Circuit Analysis II (4 credits)
             ECE 341: Random Processes (3 credits)

Spring 2018:   ECE 311: Circuit Analysis II (4 credits)

Fall 2017:   ECE 311: Circuit Analysis II (4 credits)
             ECE/PHYS 411/611/L Optics for Scientists & Engineers with Lab (3 + 1 credits)

Spring 2017:   ECE 311: Circuit Analysis II (4 credits)

Fall 2016:   ECE 311: Circuit Analysis II (4 credits)
             ECE 705: Stochastic Processes (3 credits)

Spring 2016:   ECE 311: Circuit Analysis II (4 credits)

Fall 2015:   ECE/PHYS 411/611/L Optics for Scientists & Engineers with Lab (4 credits)

Spring 2015:   ECE 311: Circuit Analysis II (4 credits)
             ECE 705: Stochastic Processes (3 credits)

Fall 2014:   ECE 311: Circuit Analysis II (4 credits)

Spring 2014:   ECE 311: Circuit Analysis II (4 credits)
             ECE 705: Stochastic Processes (3 credits)

Fall 2013:   ECE 311: Circuit Analysis II (4 credits)
             ECE/PHYS 411/611/L Optics for Scientists & Engineers with Lab (4 credits)

Spring 2013:   ECE 311: Circuit Analysis II (4 credits)
             ECE 705: Stochastic Processes (3 credits)

Fall 2012:   ECE 311: Circuit Analysis II (4 credits)
             ECE 341: Random Processes (3 credits)

Spring 2012:   ECE 705: Stochastic Processes (3 credits)

Fall 2010:   ECE 321: Electronics I (5 credits)

Spring 2010:   ECE 321: Electronics I (5 credits)
               ECE 417: Optical Signal Transmission (3 credits)

Fall 2009:   ECE 321: Electronics I (5 credits)
               ECE/PHYS 411/611/L Optics for Scientists & Engineers with Lab (4 credits)

Spring 2009:   ECE 321: Electronics I (5 credits)
               ECE 341: Random Processes (3 credits)

Fall 2008:   ECE 321: Electronics I (5 credits)

Summer 2008: ECE 341: Random Processes (3 credits)

Spring 2008:   ECE 321: Electronics I (5 credits)

Fall 2007:   ECE 321: Electronics I (5 credits)

Summer 2007: ECE 341: Random Processes (3 credits)

Spring 2007:   ECE 321: Electronics I (5 credits)

Fall 2006:   ECE 321: Electronics I (5 credits)

Spring 2006:   ECE 321: Electronics I (5 credits)

Fall 2005:   ECE 321: Electronics I (5 credits)
               ECE/PHYS 411/611/L Optics for Scientists & Engineers with Lab (4 credits)

Summer 2005: ECE 341: Random Processes (3 credits)

Spring 2005:   ECE 321: Electronics I (5 credits)

Fall 2004:   ECE 321: Electronics I (5 credits)
               ECE 796: Photonics (3 credits)

Spring 2004:   ECE 321: Electronics I (5 credits)

Fall 2003:   ECE 321: Electronics I (5 credits)

Grants
1) D. Wang, **I. T. Lima Jr.** (co-PI), Y. Wang, "Novel two-dimensional floating membrane devices for ocean carbon cycle study", $14,980 grant awarded by ND EPSCoR. Period: June 1, 2023 to February 29, 2024.
2) **I. T. Lima Jr.** (PI), "Software and Hardware integration for the Development of a Device

Prototypes for the Monitoring of Surgery Patients," $4,082 grant awarded by the NDSU Foundation and Alumni Association. Period: May 1, 2023 to October 31, 2024.

3) **I. T. Lima Jr.** (Advisor), Graduate Research Assistantship (quarter-time) in the Biomedical Engineering Program for Dhanushka Wijesinghe, $6,500 grant awarded by the NDSU College of Engineering. Period: August 16, 2023 to May 15, 2024.

4) **I. T. Lima Jr.** (Advisor), Graduate Research Assistantship (quarter-time) in the Biomedical Engineering Program for Munyaradzi Mudzingwa, $6,500 grant awarded by the NDSU College of Engineering. Period: August 16, 2023 to May 15, 2024.

5) **I. T. Lima Jr.** (Advisor), Graduate Research Assistantship (quarter-time) in the Biomedical Engineering Program for Susmita Ghosh, $6,500 grant awarded by the NDSU College of Engineering. Period: August 16, 2022 to May 15, 2023.

6) **I. T. Lima Jr.** (PI), "Development of Device Prototypes for the Monitoring of Surgery Patients," $3,000 grant awarded by the NDSU Development Foundation. Period: May 6, 2021 to October 31, 2022.

7) **I. T. Lima Jr.** (Advisor), Graduate Research Assistantship (quarter-time) in the Biomedical Engineering Program for Srilakshmi Gundlakunta, $6,500 grant awarded by the NDSU College of Engineering. Period: August 16, 2021 to May 15, 2022.

8) **I. T. Lima Jr.** (PI), "Preliminary Study of a Biosensor for the Biomarker of Neuroendocrine Tumors," $10,000 grant awarded by the ND EPSCoR. Period: October 16, 2020 to May 31, 2021.

9) **I. T. Lima Jr.** (PI), "Preliminary Studies for the Development of Therapeutic Antibodies using Dielectrophoresis," $5,000 grant awarded by the NDSU Development Foundation. Period: May 11, 2020 to October 31, 2021.

10) **I. T. Lima Jr.** (Advisor), Graduate Research Assistantship (quarter-time) in the Biomedical Engineering Program for Srilakshmi Gundlakunta, $6,500 grant awarded by the NDSU College of Engineering. Period: August 16, 2020 to May 15, 2021.

11) **I. T. Lima Jr.** (PI), "Preliminary Study of Label-Free Biosensor for Single Nucleotide Polymorphism Genotyping," $10,000 grant awarded by the ND EPSCoR. Period: September 27, 2019 to December 15, 2020.

12) **I. T. Lima Jr.** (PI), "Preliminary studies for biosensor technology for the diagnosis and prognosis of pancreatic cancer," $9,630 grant awarded by the ND EPSCoR. Period: September 7, 2018 to May 31, 2019.

13) **I. T. Lima Jr.** (Advisor), Graduate Research Assistantship (quarter-time) in the Biomedical Engineering Program for Andrew Nawrot, $8,125 grant awarded by the NDSU College of Engineering. Period: August 16, 2018 to May 15, 2019.

14) **I. T. Lima Jr.** (PI), "Demonstration of biosensor technology with sufficient sensitivity for the detection of rare cancer biomarkers," $4,978 grant awarded by the NDSU Development Foundation. Period: May 1, 2017 to September 1, 2018.

15) **I. T. Lima Jr.** (Advisor), Graduate Research Assistantship (quarter-time) in the Biomedical Engineering Program for Nolan Schwarz, $8,125 grant awarded by the NDSU College of Engineering. Period: August 16, 2017 to May 15, 2018.

16) **I. T. Lima Jr.** (PI), "Mitigation of impairments in optical fiber communications," $42,183 grant awarded by Ciena Corporation. Period: June 1, 2015 to December 31, 2017.

17) **I. T. Lima Jr.** (PI), "Modeling optical time and frequency generation and transfer systems," $11,250 grant awarded by Ciena Corporation through the University of Maryland, Baltimore County. Period: May 15, 2014 to August 15, 2014.

18) **I. T. Lima Jr.** (PI), "Enhancing NDSU students' education with state-of-the-art Graphics Processor Unit (GPU) based computing systems," $46,000 grant awarded by the NDSU Development Foundation. Period: October 1, 2012 to September 30, 2015.
19) **I. T. Lima Jr.** (PI), "Flexible optical system for the investigation of the uncertainty principle in quantum mechanics using a two-slit interferometer", $15,538 grant awarded by IONS, USA. Period: July 15 to October 30, 2012.
20) **I. T. Lima Jr.** (PI), R. Pieri, R. Kavasseri, and K. Spiering, "US – Brazil engineering education consortium on renewable energy," $208,217 grant awarded by the Fund for the Improvement of Postsecondary Education (FIPSE) at the U.S. Department of Education. Period: October 1, 2007 to September 30, 2012.
21) **I. T. Lima Jr.** (PI), and O. Swenson, "Microchip laser seeded Yb-doped photonic crystal fiber amplifier MOPA laser for atmospheric LIDAR systems," $13,276 grant awarded by the NASA EPSCoR, Period: November 2007 to August 2008.
22) **I. T. Lima Jr.** (PI), and O. Swenson, "Quantum-dot saturable absorbers for optical fiber lasers," $10,000 grant awarded by the NDSU Research Foundation. Period: February 2006 to February 2007.
23) J. McEvoy, E. Khan, and **I. T. Lima Jr.** (co-PI), "Novel approaches for assessing quantity and viability of pathogens in water," $10,000 grant awarded by the Environmental and Conservation Sciences program at NDSU. Period: May 16, 2005 to August 15, 2005.
24) **I. T. Lima Jr.** (PI), "Laser sources for photonics research", $4,681 grant awarded by the College of Engineering and Architecture, NDSU. Period: May 16, 2005 to August 15, 2005.
25) **I. T. Lima Jr.** (PI), "Startup funds to establish a Photonics Research Laboratory at NDSU", $100,000 awarded by the Department of Electrical and Computer Engineering at NDSU. Period: August 2003 to May 2005.

Total number of citations from publications: **1702** (Source: Google Scholar, 04/02/2025).

Archival journal publications
1) N. G. Schwarz, D. Wijesinghe, **I. T. Lima Jr.**, "Treatment of venous thromboembolisms using a wireless-powered thrombolytic filter", *Exploration of BioMat-X*, 2:101333, April 1, 2025.
2) T. D. S. De Menezes, C. Tu, V. Besse, M. O'Sullivan, V. S. Grigoryan, C. R. Menyuk and **I. T. Lima Jr.**, "Nonlinear Spectrum Modulation in the Anomalous Dispersion Regime Using Second- and Third-Order Solitons", *Photonics*, Vol. 9, Iss. 10, Num. 748, pp. 1-25, October 2022.
3) A. Bauer, S. Elamurugan, S. T. Selim, Fatima, E. Nega. **I. T. Lima Jr.**, W. Xia, and Dali Sun, "A portable elliptical dichroism spectrometer targeting secondary structural features of tumorous protein for pancreatic cancer detection", *Biosensors and Bioelectronics*, Vol. 222, Article 114934, pp. 1-11, November 2022.
4) F. D. Gudagunti, S. Gundlakunta, and **I. T. Lima Jr.**, "Dielectrophoresis-Based Biosensor for the Cancer Biomarkers CEA and CA 242 in Serum", *Chemosensors*, Vol. 10, Iss. 3, pp. 1-8, March 2022.
5) F. D. Gudagunti, L. Velmanickam, D. Nawarathna, and **I. T. Lima Jr.**, "Nucleotide Identification in DNA Using Dielectrophoresis Spectroscopy", *Micromachines*, Vol. 11, Iss. 1, pp. 1-11, January 2020.

6) F. D. Gudagunti, V. Jayasooriya, D. Nawarathna, and **I. T. Lima Jr.**, "Biosensor for the Characterization of Gene Expression in Cells", *Chemosensors*, Vol. 7, Iss. 4, pp. 1-10, November 2019.

7) F. D. Gudagunti, L. Velmanickam, D. Nawarathna, and **I. T. Lima Jr.**, "Label-Free Biosensing Method for the Detection of a Pancreatic Cancer Biomarker Based on Dielectrophoresis Spectroscopy", Chemosensors, Vol. 6, Iss. 3, pp. 1-10, August 2018.

8) C. E. Rubio-Mercedes, V. F. Rodriguez-Esquerre, **I. T. Lima Jr**., and H. E. Hernández-Figueroa, "Analysis of the Propagation Properties of 90°-bend Periodic Segmented Waveguides Using the 2D Finite Element Method," *Journal of Microwaves, Optoelectronics and Electromagnetic Applications*, Vol. 17, No. 1, pp. 32-43, March 2018.

9) **I. T. Lima Jr.**, T. D. S. DeMenezes, V. S. Grigoryan, M. O'Sullivan, and C. R. Menyuk, "Nonlinear Compensation in Optical Communications Systems with Normal Dispersion Fibers Using the Nonlinear Fourier Transform," *IEEE/OSA Journal of Lightwave Technology*, Vo. 35, No. 23, pp. 5056-5068, December 2017.

10) L. Velmanickam, M. Fondakowski, **I. T. Lima Jr.**, and D. Nawarathna, "Integrated dielectrophoretic and surface plasmonic platform for million-fold improvement in the detection of fluorescent events," *AIP Biomicrofluidics*, Vol. 11, Iss. 4, pp. 044115 1-7, August 2017.

11) S. Malektaji, **I. T. Lima Jr.**, M. R. Escobar I., and S. S. Sherif, "Massively Parallel Simulator of Optical Coherence Tomography of Inhomogeneous Turbid Media," *Elsevier Computer Methods and Programs in Biomedicine*, Vol. 150, pp. 97-105, October 2017.

12) S. A. M. Kirmani, F. D. Gudagunti, L. Velmanickam, D. Nawarathna, and **I. T. Lima Jr.**, "Negative dielectrophoresis spectroscopy for rare analyte quantification in biological samples," *SPIE Journal of Biomedical Optics*, Vol. 22, No. 3, pp. 037006 1-7, March 2017.

13) B. C. Coutinho, F. O. Lima, A. S. Garcia, **I. T. Lima Jr.**, Marcelo, E. V. Segatto, "Multilayer Approach for Optical Networks Planning," *SBMO/SBMag Journal of Microwaves, Optoelectronics and Electromagnetic Applications*, Vol. 15, No. 1, pp. 49-64, March 2016.

14) C. E. Rubio-Mercedes, V. F. Rodriguez-Esquerre, **I. T. Lima Jr**., and H. E. Hernández-Figueroa, "Analysis of Straight Periodic Segmented Waveguide Using the 2D Finite Element Method," *IEEE/OSA Journal of Lightwave Technology,* Vol. 32, No. 11, pp. 2163-2169, June 2014.

15) A. Y. Yamamoto, A. M. Oliveira, and **I. T. Lima Jr.**, "Performance Characterization of Multicanonical Monte Carlo Method Applied to Polarization Mode Dispersion," *SPIE Optical Engineering*, Vol. 5, No. 53, pp. 056104-1 to 6, May 2014.

16) S. Malektaji, **I. T. Lima Jr.**, and S. S. Sherif, "Monte Carlo simulation of optical coherence tomography for turbid media with arbitrary spatial distributions," *SPIE Journal of Biomedical Optics*, Vol. 19, No. 4, pp. 046001-1 to 8, April 2014.

17) C. E. Rubio-Mercedes, V. F. Rodriguez-Esquerre, **I. T. Lima Jr**., and H. E. Hernández-Figueroa, "Design and Chromatic Aberration Analysis of Plasmonic Lenses Using the Finite Element Method," *IEEE/OSA Journal of Lightwave Technology*, Vol. 31. No. 7, pp. 1114-1119, April 2013.

18) M. Grilo, F. J. Arnold, M. S. Gonçalves, L. L. Bravo-Roger, A. Moretti, and **I. T. Lima Jr**., "Novel Dual-Band RFID Antenna Configuration with Independent Tuning Adjustment," *Wiley Microwave and Optical Technology Letters*, Vol. 54, No. 9, pp. 2214-2217, September 2012.

19) S. Manjooran, H. Zhao, **I. T. Lima Jr**., and A. Major, "Phase-matching properties of PPKTP, MgO:PPSLT and MgO:PPcLN for ultrafast optical parametric oscillation in the visible and near-infrared ranges with green pump," *Laser Physics*, Vol. 22, Iss. 8, pp. 1325-1330, August 2012.

20) **I. T. Lima Jr.**, A. Kalra, H. E. Hernández-Figueroa, and S. S. Sherif, "Fast calculation of multipath diffusive reflectance in optical coherence tomography," *OSA Biomedical Optics Express*, Vol. 3, Iss. 4, pp. 692-700, March 2012.

21) H. Zhao, K. Sukhoy, and **I. T. Lima Jr.**, and A. Major, "Generation of green second harmonic with 60% conversion efficiency from a Q-switched microchip laser in MgO:PPLN crystal," *Laser Physics Letters*, Vol. 9, Iss. 5, pp. 355-358, May 2012.

22) **I. T. Lima Jr.**, A. Kalra, and S. S. Sherif, "Improved importance sampling for Monte Carlo simulation of time-domain optical coherence tomography," *OSA Biomedical Optics Express*, Vol. 2, Iss. 5, pp. 1069-1081, May 2011.

23) A. Major, K. Sukhoy, H. Zhao, and **I. T. Lima Jr.**, "Green sub-nanosecond microchip laser based on BBO crystals," *Laser Physics*, Vol. 21, No. 1, pp. 57-60, January 2011.

24) A. M. Oliveira and **I. T. Lima Jr.**, "A Step towards global engineering education: The U.S.−Brazil engineering exchange partnership," *Online Journal of Global Engineering*, Vol. 5, Iss. 1, Art. 2, pp. 1-19, January 2010.

25) **I. T. Lima Jr.** and V. R. Marinov, "Volumetric display based on two-photon absorption in quantum dot dispersions," *IEEE/OSA Journal of Display Technology*, Vol. 6, No. 6, pp. 221–2228, June 2010.

26) H. Zhao, **I. T. Lima Jr.**, and A. Major, "Near-infrared properties of periodically poled KTiOPO4 and stoichiometric MgO-doped LiTaO3 crystals for high power optical parametric oscillation with femtosecond pulses", *Laser Physics*, Vol. 20, No. 6, pp. 1404-1409, June 2010.

27) **I. T. Lima Jr**., V. Kultavewuti, and A. Major, "Phasematching properties of congruent MgO-doped and undoped periodically poled LiNbO3 for optical parametric oscillation with ultrafast excitation at 1 μm", *Laser Physics*, Vol. 20, No. 1, pp. 270-275, January 2010.

28) **I. T. Lima Jr.** and A. M. Oliveira, "Optimum receiver filters for optical fiber systems with polarization mode dispersion," *IEEE/OSA Journal of Lightwave Technology*, Vol. 27, No. 14, pp. 2886–2891, July 2009.

29) A. M. Oliveira, **I. T. Lima Jr.**, and C. R. Menyuk, "Error estimation in multicanonical Monte Carlo simulations with applications to polarization mode dispersion emulators," *IEEE/OSA Journal of Lightwave Technology*, Vol. 23, No. 11, pp. 3781–3789, November, 2005.

30) A. M. Oliveira, C. R. Menyuk, and **I. T. Lima Jr.**, "Comparison of two biasing Monte Carlo methods for calculating outage probabilities in systems with multi-section PMD compensators," *IEEE Photonics Technology Letters*, Vol. 17, No. 12, pp. 2580–2582, December 2005.

31) **I. T. Lima Jr.**, A. M. Oliveira, Y. Sun, H. Jiao, J. Zweck, C. R. Menyuk, and G. M. Carter, "A receiver model for optical fiber communication systems with arbitrarily polarized noise," *IEEE/OSA Journal of Lightwave Technology*, Vol. 23, No. 3, pp. 1478–1490, March 2005.

32) T. M. Fortier, S. T. Cundiff, **I. T. Lima Jr.**, B. S. Marks, C. R. Menyuk, and R. S. Windeler, "Nonlinear polarization evolution of ultrashort pulses in microstructure fiber," *OSA Optics Letters*, Vol. 29, No. 21, pp. 2548–2550, November 2004.

33) **I. T. Lima Jr.**, A. M. Oliveira, G. Biondini, C. R. Menyuk, and W. L. Kath, "A comparative study of single section polarization-mode dispersion compensators," *IEEE/OSA Journal of Lightwave Technolog*y, Vol. 22, No. 4, pp. 1023–1032, April 2004.

34) Y. Sun, **I. T. Lima Jr.**, A. M. Oliveira, H. Jiao, J. Zweck, L. Yan, C. R. Menyuk, and G. M. Carter, "System performance variations due to partially polarized noise in a receiver," *IEEE Photonics Technology Letters*, Vol. 15, No. 11, pp. 1648–1650, November 2003.

35) J. Zweck, **I. T. Lima Jr.**, Yu Sun, A. M. Oliveira, C. R. Menyuk, and G. M. Carter, "Modeling receivers in optical communication systems with polarization effects," *OSA Optics & Photonics News*, Vol. 14, No. 11, pp. 30–35, November 2003.

36) **I. T. Lima Jr.**, A. M. Oliveira, J. Zweck, and C. R. Menyuk, "Performance characterization of chirped return-to-zero modulation format using an accurate receiver model," *IEEE Photonics Technology Letter*s, Vol. 15, No. 4, pp. 608–610, April 2003.

37) A. M. Oliveira, **I. T. Lima Jr.**, C. R. Menyuk, G. Biondini, and W. L. Kath, "Statistical analysis of the performance of PMD compensators using multiple importance sampling," *IEEE Photonics Technology Letters*, Vol. 15, No. 12, pp. 1716–1718, December 2003.

38) Y. Sun, A. M. Oliveira, **I. T. Lima Jr.**, J. Zweck, L. Yan, C. R. Menyuk, and G. M. Carter, "Statistics of the system performance in scrambled recirculating loop with PDL and PDG," *IEEE Photonics Technology Letters*, Vol. 15, No. 8, pp. 1067–1069, August 2003.

39) **I. T. Lima Jr.**, A. M. Oliveira, J. Zweck, and C. R. Menyuk, "Efficient computation of outage probabilities due to polarization effects in a WDM system using a reduced Stokes model and importance sampling," *IEEE Photonics Technology Letters*, Vol. 15, No. 1, pp. 45–47, January 2003.

40) A. M. Oliveira, **I. T. Lima Jr.**, C. R. Menyuk, and T. Adali, "Comparison of penalties resulting from first-order and all-order polarization mode dispersion in optical fiber transmission systems," *OSA Optics Letters*, Vol. 28, No. 5, pp. 310–311, March 2003.

41) B. S. Marks, **I. T. Lima Jr.**, and C. R. Menyuk, "Autocorrelation function for PMD emulators with rotators," *OSA Optics Letters*, Vol. 27, No. 13, pp. 1150−1152, July 2002.

42) **I. T. Lima Jr.**, G. Biondini, B. S. Marks, W. L. Kath, and C. R. Menyuk, "Analysis of PMD compensators with fixed DGD using importance sampling," *IEEE Photonics Technology Letters*, Vol. 14, No. 5, pp. 627–629, May 2002.

43) A. M. Oliveira, **I. T. Lima Jr.**, T. Adali and C. R. Menyuk, "A novel polarization diversity receiver for PMD mitigation," *IEEE Photonics Technology Letters*, Vol. 14, No. 4, pp. 465–467, April 2002.

44) **I. T. Lima Jr.**, R. Khosravani, P. Ebrahimi, E. Ibragimov, A. E. Willner, and C. R. Menyuk, "Comparison of polarization-mode dispersion emulators," *IEEE/OSA Journal of Lightwave Technology*, Vol. 19, No. 12, pp. 1872–1881, December 2001.

45) C. R. Menyuk, R. Holzlöhner, and **I. T. Lima Jr.**, "Advances in modeling of optical fiber transmission systems," *IEEE LEOS Newsletter*, Vol. 15, pp. 21–23, October 2001.

46) Y. Sun, **I. T. Lima Jr.**, H. Jiao, J. Wen, H. Xu, H. Ereifej, C. R. Menyuk, and G. Carter, "Study of system performance in a 107 km dispersion managed recirculating loop due to polarization effects," *IEEE Photonics Technology Letters*, Vol. 13, No. 9, pp. 966–968, September 2001.

47) R. Khosravani, **I. T. Lima Jr.**, P. Ebrahimi, E. Ibragimov, A. E. Willner, and C. R. Menyuk, "Time and frequency domain characteristics of polarization-mode dispersion emulators," *IEEE Photonics Technology Letters*, Vol. 13, No. 2, pp. 127–129, February 2001.

48) **I. T. Lima Jr.** and A. J. Giarola, "Frequency selective properties of two-dimensional dielectric gratings: TE and TM polarizations," *International Journal of Infrared and Millimeter Waves*, Vol. 21, No. 3, pp. 447–459, March 2000.

49) G. V. Grigoryan, **I. T. Lima Jr.**, T. Yu, V. S. Grigoryan, and C. R. Menyuk, "Using color to understand light transmission," *OSA Optics & Photonics News*, Vol. 11, No. 8, pp. 44–50, August 2000.

50) **I. T. Lima Jr.** and A. J. Giarola, "An integral equation analysis of two-dimensional dielectric gratings," *Wiley Microwave and Optical Technology Letters*, Vol. 20, No. 5, pp. 329–333, March 1999.

Book chapters

1) **I. T. Lima Jr**., and S. S. Sherif, "Monte Carlo Methods for Simulation of Optical Coherence Tomography of Turbid Media," in Theory, Application, and Implementation of Monte Carlo Method in Science and Technology, DOI: 10.5772/intechopen.89555, pp. 1–115, edited by Dr. Pooneh Saidi Bidokhti, InTech, 2019.

2) A. M. Oliveira, and **I. T. Lima Jr**., "Multicanonical Monte Carlo Method Applied to the Investigation of Polarization Effects in Optical Fiber Communication Systems," in Current Developments in Optical Fiber Technology, ISBN 978-953-51-1148-1, pp. 123–157, edited by S. W. Harun and H. Arof, InTech, 2013.

3) C. R. Menyuk, B. S. Marks, **I. T. Lima Jr.**, J. Zweck, Y. Sun, G. M. Carter, and D. Wang, "Polarization effects in long-haul undersea systems," in Undersea Fibre Communication Systems, ISBN 978-0-12-171408-6, pp. 269–305, edited by J. Chesnoy, Academic Press: San Diego, CA, 2002.

Papers and presentations at conferences

1) T. D. S. DeMenezes and **I. T. Lima Jr.**, "Performance Limits of an Optical Fiber Communication System with Third-Order Solitons", in Proceedings of the 2022 IEEE Research and Applications of Photonics in Defense Conference (RAPID), paper WE4.4, Miramar Beach, Florida, USA, September 12-14, 2022.

2) F. D. Gudagunti, S. G. Gundlakunta, D. Nawarathna, and **I. T. Lima Jr.**, "Characterization of the Binding Affinity of a Cancer Biomarker and Its Antibody Using Dielectrophoresis", in Proceedings of the 2020 IEEE Research and Applications of Photonics in Defense Conference (RAPID), Virtual Conference, USA, August 2-4, 2021.

3) F. D. Gudagunti, S. Afrose, D. Nawarathna, and **I. T. Lima Jr.**, "Label-free Detection of Cancer Antigen CEA in Serum," in Proceedings of the 2020 Biomedical Engineering Society Annual Meeting (BMES 2020), paper 333, Virtual Meeting, USA, October 14-17, 2020.

4) A. Nawrot, Q. Dang, S. G. Gundlakunta, F. D. Gundagunti, and **I. T. Lima Jr.**, "Wearable Device for EOG Signal Extraction and Wireless Smartphone Processing," in Proceedings of the 2020 Biomedical Engineering Society Annual Meeting (BMES 2020), paper 1545, Virtual Meeting, USA, October 14-17, 2020.

5) F. D. Gudagunti, P. Mulinti, D. Nawarathna, A. Brooks, and **I. T. Lima Jr.**, "Dielectrophoresis Based Sensor for Heparin Detection", in Proceedings of the 2020 IEEE Research and Applications of Photonics in Defense Conference (RAPID), Virtual Conference, USA, August 10-12, 2020.

6) D. Nawarathna, L. Velmanickam, and **I. T. Lima Jr.**, "Achieving over million-fold fluorescence enhancement for biosensing applications", in Proceedings of the 20120 IEEE

Research and Applications of Photonics in Defense Conference (RAPID), Virtual Conference, USA, August 10-12, 2020.

7) F. D. Gudagunti, L. Velmanickam, D. Nawarathna, and **I. T. Lima Jr.**, "Detection of Nucleotide Polymorphisms Using Dielectrophoresis", in Proceedings of the 2019 IEEE Research and Applications of Photonics in Defense Conference (RAPID), paper WF2.3, Miramar Beach, Florida, USA, August 19-21, 2019.

8) F. D. Gudagunti, V. Jayasooriya, D. Nawarathna, and **I. T. Lima Jr.**, "Image Processing Method for Rapid Messenger RNA Profiling from Living Cells", in Proceedings of the 2019 IEEE Research and Applications of Photonics in Defense Conference (RAPID), paper WF2.5, Miramar Beach, Florida, USA, August 19-21, 2019.

9) L. Velmanickam, R. Pokharel, **I. T. Lima Jr.**, and D. Nawarathna, "Label free microRNA biomarker detection in serum samples for diagnosis applications at point-of care", in Proceedings of the 2019 IEEE Research and Applications of Photonics in Defense Conference (RAPID), paper WF2.4, Miramar Beach, Florida, USA, August 19-21, 2019.

10) F. Gudagunti, S. Afrose, J. Thrash, D. Nawarathna, and **I. T. Lima Jr.**, "Spectroscopy Quantification of Pancreatic Cancer Antigen CA 242 Using Dielectrophoresis," in Proceedings of the 2019 Biomedical Engineering Society Annual Meeting (BMES 2019), paper 762, Philadelphia, Pennsylvania, USA, October 16-19, 2019.

11) J. Thrash, F. Gudagunti, B. Hoffmann, S. A. M. Kirmani, A. Brooks, and **I. T. Lima Jr.**, "Real-Time Image Processing Method for Characterizing Silk Fiber Material," in Proceedings of the 2019 Biomedical Engineering Society Annual Meeting (BMES 2019), paper 855, Philadelphia, Pennsylvania, USA, October 16-19, 2019.

12) L. Velmanickam, **I. T. Lima Jr.**, and D. Nawarathna, "External AC electric fields optimize the fluorescence enhancement produced by the light-metal-fluorophore interactions", in Proceedings of SPIE Photonics West 2019, paper 10881-28, San Francisco, California, USA, February 2-7, 2019.

13) **I. T. Lima Jr.**, "Comparison of Digital Back-Propagation with Nonlinear Fourier Transform and Split-Step Fourier for Nonlinear Mitigation in Optical Fiber Systems", in Proceedings of the 2018 IEEE Photonics Research and Applications of Photonics in Defense Conference (RAPID), paper ThB3.4, Miramar Beach, Florida, USA, August 22-24, 2018.

14) F. D. Gudagunti, L. Velmanickam, D. Nawarathna, and **I. T. Lima Jr.**, "Biosensor for Pancreatic Cancer Biomarker Based on Dielectrophoresis and Image Processing", in Proceedings of the 2018 IEEE Research and Applications of Photonics in Defense Conference (RAPID), paper FA3.4, Miramar Beach, Florida, USA, August 22-24, 2018.

15) L. Velmanickam, **I. T. Lima Jr.**, and D. Nawarathna, "High Throughput and Low-Cost Detection of Short Nucleic Acid Biomarkers in Serum Using Dielectrophoretic Biosensor", in Proceedings of the 2018 IEEE Research and Applications of Photonics in Defense Conference (RAPID), paper FA4.4, Miramar Beach, Florida, USA, August 22-24, 2018.

16) F. D. Gudagunti, L. Velmanickam, D. Nawarathna, and **I. T. Lima Jr.**, "Spectroscopy Method for the Quantification of Pancreatic Cancer Antigen in Serum Using Dielectrophoresis," in Proceedings of the 2018 Biomedical Engineering Society Annual Meeting (BMES 2018), Atlanta, Georgia, USA, October 17-20, 2018.

17) L. Velmanickam, M. Fondakowski, **I. T. Lima Jr.**, and D. Nawarathna, "High sensitive integrated dielectrophoretic and LSPR sensor for biomarker detection," in Proceedings of the 2018 Biomedical Engineering Society Annual Meeting (BMES 2018), Atlanta, Georgia, USA, October 17-20, 2018.

18) N. G. Schwarz and **I. T. Lima Jr**., "Effectiveness of Wireless Powered Filters in the Thrombolysis of Blood Clots", in Proceedings of 55th Annual Rocky Mountain Bioengineering Symposium, An International Society of Automation Symposium, Fargo, North Dakota, USA, April 13-14, 2018.

19) F. D. Gudagunti, L. Velmanickam, J. E. Thrash III, D. Nawarathna, and **I. T. Lima Jr**., "Accurate method to measure concentration of CA 19-9 using dielectrophoresis", 55th Annual Rocky Mountain Biengineering Symposium, An International Society of Automation Symposium, Fargo, North Dakota, USA, April 13-14, 2018.

20) F. D. Gudagunti, L. Velmanickam, D. Nawarathna, and **I. T. Lima Jr**., "Label-Free DNA Identification Using Light Scattering from Microbeads and Dielectrophoresis Spectroscopy", in Proceedings of the 2017 IEEE Photonics Conference, Orlando, Florida, USA, October 1-5, 2017.

21) T. D. S. DeMenezes, V. S. Grigoryan, M. O'Sullivan, C. R. Menyuk, and **I. T. Lima Jr.,** "Performance Limits of a Nonlinear Frequency Division Multiplexed System due to the Raman effect," in Proceedings of the 2017 IEEE Photonics Conference, Orlando, Florida, USA, October 1-5, 2017.

22) F. D. Gudagunti, L. Velmanickam, D. Nawarathna, and **I. T. Lima Jr**., "Dependence of Negative Dielectrophoresis Spectrum on the Length of Single-Stranded DNA", in Proceedings of the 2017 Biomedical Engineering Society Annual Meeting (BMES 2017), Phoenix, Arizona, USA, October 11-14, 2017.

23) S. A. M. Kirmani, F. D. Gudagunti, L. Velmanickam, D. Nawarathna, and **I. T. Lima Jr**., "Dielectrophoretic Spectroscopy Using a Microscopic Electrode Array," in Proceedings of SPIE Photonics West 2017, paper 100680Z-1, pp. 1-13, San Francisco, California, USA, January 28 - February 2, 2017.

24) A.-M. I. M. Aldaoudeyeh, R. Kavasseri, and **I. T. Lima Jr.,** "Characterization of Forward Electricity Market Price Variations and Price-Responsive Demands," in Proceedings of 9th Annual IEEE Green Technologies Conference (GreenTech), paper 03-01, Denver, Colorado, USA, March 29-31, 2017.

25) **I. T. Lima Jr**., L. Velmanickam, M. Fondakowski, and D. Nawarathna, "Quantification of Fluorescence Enhancement Due to Dielectrophoresis and the Plasmonic Effect Using Time-Resolved Fluorescence," in Proceedings of Frontiers in Optics 2016 (FiO 2016), Rochester, New York, USA, October 17-21, 2016.

26) L. Velmanickam, M. Fondakowski, **I. T. Lima Jr.,** and D. Nawarathna, "Rare Biomarker Quantification Through Integrated Dielectrophoretic and Plasmonic based Fluorescence Enhancement," in Proceedings of the 2016 Biomedical Engineering Society Annual Meeting (BMES 2016), Minneapolis, Minnesota, USA, October 5-8, 2016.

27) S. A. M. Kirmani, L. Velmanickam1, D. Nawarathna1, S. S. Sherif, and **I. T. Lima Jr.,** "Simulation of Diffuse Optical Tomography using COMSOL Multiphysics," in Proceedings of the COMSOL Conference, pp. 1-5, Boston, Massachusetts, USA, October 5-7, 2016.

28) V. Besse, C. Tu, T. De Menezes, C. R. Menyuk, **I. T. Lima Jr**., V. S. Grigoryan, "Impact of the Raman effect on the multi-eigenvalue communication," Nonlinear Nanophotonics meets Nanomagnetism 2016, Le Mans, France, September 20-23, 2016.

29) **I. T. Lima Jr.,** V. S. Grigoryan, M. O'Sullivan, and C. R. Menyuk, "Computational Complexity of Nonlinear Transforms Applied to Optical Communications Systems with Normal Dispersion Fibers," in Proceedings of the 2015 IEEE Photonics Conference, pp. 277-278, Reston, Virginia, USA, October 4-8, 2015.

30) Y. Iano, **I. T. Lima Jr.**, H. J. Loschi, T. C. Lustosa, O. S. Mesquita, A. Moretti, "Internet Broadband Network of Things Applied to Intelligent Education," in Proceedings of the 4th International Conference on Smart Cities and Green ICT Systems (SMARTGREENS 2015), paper 36, Lisbon, Portugal, May 20-22, 2015.

31) M. R. Escobar I., S. Malektaji, **I. T. Lima Jr.**, and S. S. Sherif, "Accelerated simulation of optical coherence tomography of objects with arbitrary spatial distribution," in Proceedings SPIE 9288, 16th Photonics North Conference, paper 928818, Montreal, Quebec, Canada, May 28-30, 2014.

32) S. Malektaji, **I. T. Lima Jr.**, and S. S. Sherif, "Simulation of optical coherence tomography imaging of an arbitrary shaped turbid object," in Proceedings of Biomedical Optics (BIOMED) Topical Meeting, paper BT34.69, Miami, Florida, USA, April 26-30, 2014.

33) A. Kalra, **I. T. Lima Jr.**, and S. S. Sherif, "Almost Instantaneous Monte Carlo calculation of Optical Coherence Tomography Signal Using Graphic Processing Unit," in Proceedings of IEEE Photonics Conference 2013, paper MA2.3, Bellevue (Seattle Metro Area), Washington, USA, September 8-12, 2013.

34) **I. T. Lima Jr.**, A. Kalra, H. E. Hernández-Figueroa, and S. S. Sherif, "Fast computation of optical coherence tomography signal using an importance sampling-based Monte Carlo method," in SPIE Proceedings of Photonics West 2012, paper 8221-34, San Francisco, California, USA, January 21-26, 2012.

35) H. Zhao, K. Sukhoy, **I. T. Lima Jr.**, A. Major, "Highly efficient Q-switched green microchip laser based on second harmonic generation in MgO-doped PPLN," in SPIE Proceedings of Photonics West 2012, paper 8240-3, San Francisco, California, USA, January 21-26, 2012.

36) C. E. Rubio-Mercedes, H. E. Hernández-Figueroa, **I. T. Lima Jr.**, and V. F. Rodriguez-Esquerre, "Simulation of Segmented Waveguide Crossing Usingthe 2D Finite Element Method," in Proceedings of 2011 IEEE Photonics Conference, paper ThR 5, Arlington, Virginia, USA, October 9-13, 2011.

37) C. E. Rubio-Mercedes, H. E. Hernández-Figueroa, **I. T. Lima Jr.**, and V. F. Rodriguez-Esquerre, "Periodic Segmented Waveguide Analysis by Using the 2D Finite Element Method," in Proceedings of 2011 SBMO/IEEE MTT-S International Microwave and Optoelectronics Conference, paper 89035, Natal, Rio Grande do Norte, Brazil, October 29-November 1, 2011.

38) A. M. Oliveira and **I. T. Lima Jr.**, "U.S.−Brazil Engineering Exchange Program: Lessons Learned," in Proceedings of the 2011 ASEE Annual Conference & Exposition, paper AC2011-112, Vancouver, British Columbia, Canada, June 26-29, 2011.

39) H. Zhao, **I. T. Lima Jr.**, and A. Major, "Peculiarities of temperature-dependent Sellmeier equations for periodically poled KTiOPO4 crystal in the near-infrared and visible ranges," SPIE Proceedings, Photonics North 2010, Vol. 7750, p. 77501D, Niagara Falls, Ontario, Canada, June 1-3, 2010.

40) V. R. Marinov, **I. T. Lima Jr.**, and Ross Miller, "Quantum dot dispersions: A new material for true volumetric displays." in SPIE Proceedings of the Three-Dimensional Imaging, Visualization, and Display 2010, Symposium: DSS10, SPIE Defense, Sensing, and Security Conference, Vol. 7690, Orlando, Florida, USA, April 5-9, 2010.

41) D. Peterson, Jr., T. Dennis, **I. T. Lima Jr.**, and P. Williams, Short Course: "Hands-on polarization measurement workshop" (invited), Optical Fiber Communication Conference & Exposition and National Fiber Optic Engineers Conference (OFC/NFOEC) 2010, SC210, Short Course Notes pp. 1–54, San Diego, California, USA, March 21-25, 2010.

42) **I. T. Lima Jr.**, "Advanced Monte Carlo methods applied to Optical Coherence Tomography," (invited) 2009 SBMO/IEEE MTT-S International Microwave and Optoelectronics Conference, Belém, Pará, Brazil, November 3-6, 2009.

43) **I. T. Lima Jr.**, Short Course: "Polarization Effect in Optical Fiber Communication Systems," (invited) 2009 SBMO/IEEE MTT-S International Microwave and Optoelectronics Conference, Belém, Pará, Brazil, November 3-6, 2009.

44) **I. T. Lima Jr**. and A. M. Oliveira "Receiver Optimization for 40 Gbit/s Optical Fiber Systems with Polarization Mode Dispersion," in Proceedings of the SBMO/IEEE MTT-S International Microwave and Optoelectronics Conference, Belém, Pará, Brazil, November 3-6, 2009.

45) A. M. Oliveira and **I. T. Lima Jr**., "Electrical Mitigation Techniques for Polarization Mode Dispersion in Optical Fiber Systems," in Proceedings of the SBMO/IEEE MTT-S International Microwave and Optoelectronics Conference, Belém, Pará, Brazil, November 3-6, 2009.

46) O. F. Swenson, D. A. Rogers, and **I. T. Lima Jr**., "Laboratory Emphasis in Interdisciplinary Photonics Related Courses," in Topical Conference on Advanced Laboratories, Ann Arbor, Michigan, USA, July 23-25, 2009.

47) O. F. Swenson, D. A. Rogers, and **I. T. Lima Jr**., "Optics for Scientists and Engineers Laboratory Syllabus," in Topical Conference on Advanced Laboratories, Ann Arbor, Michigan, USA, July 23-25, 2009.

48) V. Kultaveewuti, **I. T. Lima Jr**., and A. Major, "Development of a widely tunable pulsed excitation source for laser microscopy," in 36th Annual Meeting 2009 of the Microscopical Society of Canada, Winnipeg, Manitoba, Canada, June 16-29, 2009.

49) A. M. Oliveira, and **I. T. Lima Jr.**, "Implementation of an international multidisciplinary engineering education consortium," in Proceedings of the 2009 ASEE Annual Conference & Exposition, paper AC 2009-57, Session 1360, no. 1, Austin, Texas, USA, June 14–17, 2009.

50) D. Peterson, Jr., T. Dennis, **I. T. Lima Jr.**, and P. Williams, Short Course: "Hands-on polarization measurement workshop" (invited), Optical Fiber Communication Conference & Exposition and National Fiber Optic Engineers Conference (OFC/NFOEC) 2009, SC210, Short Course Notes pp. 1–54, San Diego, California, USA, March 22-26, 2009.

51) D. Peterson, Jr., K. Rochford, **I. T. Lima Jr.**, and P. Williams, Short Course: "Hands-on polarization measurement workshop" (invited), Optical Fiber Communication Conference & Exposition and National Fiber Optic Engineers Conference (OFC/NFOEC) 2008, SC210, Short Course Notes pp. 1–54, San Diego, California, USA, February 24–28, 2008.

52) M. D. Cocuzzi, K. L. Schepler, P. E. Powers, and **I. T. Lima Jr.**, "Sub-nanosecond infrared optical parametric pulse generation in PPLN pumped with a seeded fiber amplifier," in Proceedings of the 2008 Advanced Solid-State Photonics (ASSP) Topical Meeting, paper WB30, Nara, Japan, January 27–30, 2008.

53) X. Liu, **I. T. Lima Jr.**, and O. F. Swenson, "Modeling sub-nanosecond pulsed laser dynamics using the exponential time differencing method," in Proceedings of the Conference on Lasers and Electro-Optics (CLEO/QELS) 2007, paper JWA74, Baltimore, Maryland, USA, May 6–11, 2007.

54) D. Peterson, Jr., K. Rochford, **I. T. Lima Jr.**, and R. Fortenberry, Short Course: "Hands-on polarization measurement workshop" (invited), Optical Fiber Communication Conference & Exposition and National Fiber Optic Engineers Conference (OFC/NFOEC) 2007, SC210, Short Course Notes pp. 1–54, Anaheim, California, USA, March 25–29, 2007.

55) P. Hernday, D. Peterson, Jr., R. Fortenberry, and **I. T. Lima Jr.**, Short Course: "Hands-on polarization measurement workshop" (invited), Optical Fiber Communication Conference & Exposition and National Fiber Optic Engineers Conference (OFC/NFOEC) 2006, SC210, Short Course Notes pp. 1–27, Anaheim, California, USA, March 5–10, 2006.

56) A. M. Oliveira, **I. T. Lima Jr.**, C. R. Menyuk, and J. Zweck, "Performance evaluation of single-section and three-section PMD compensators using extended Monte Carlo methods," in Proceedings of the Optical Fiber Communication Conference and Exposition & National Fiber Optic Engineers Conference (OFC/NFOEC) 2005, paper OME27, Anaheim, California, USA, March 6–11, 2005.

57) P. Hernday, D. Peterson, Jr., R. Fortenberry, and **I. T. Lima Jr.**, Short Course: "Hands-on polarization measurement workshop" (invited), Optical Fiber Communication Conference & Exposition and National Fiber Optic Engineers Conference (OFC/NFOEC) 2005, SC210-A and SC210-B, Short Course Notes pp. 1–27, Anaheim, California, USA, March 6–11, 2005.

58) P. Hernday, D. Peterson, Jr., R. Fortenberry, and **I. T. Lima Jr.**, Short Course: "Hands-on polarization measurement workshop" (invited), Optical Fiber Communication Conference and Exposition (OFC) 2004, SC210, Short Course Notes pp. 1–27, Los Angeles, California, USA, February 22–27, 2004.

59) **I. T. Lima Jr.** and A. M. Oliveira, "Computation of the probability of power penalty and Q-penalty outages due to PMD," in Proceedings of the LEOS Annual meeting 2003, paper TuQ1, Tucson, Arizona, USA, October 26–30, 2003.

60) A. M. Oliveira, **I. T. Lima Jr.**, J. Zweck, and C. R. Menyuk, "Efficient computation of PMD-induced penalties using Multicanonical Monte Carlo simulations," in Proceedings of the 29th European Conference on Optical Communication (ECOC) 2003, paper We364, Rimini, Italy, September 21–25, 2003.

61) **I. T. Lima Jr.**, L.-S. Yan, B. S. Marks, C. R. Menyuk, and A. E. Willner, "Experimental verification of the penalty produced by the polarization effects in fiber recirculating loops," in Proceedings of the Conference on Lasers and Electro-Optics (CLEO/QELS) 2003, paper CThD2, Baltimore, Maryland, USA, June 1–6, 2003.

62) **I. T. Lima Jr.**, A. M. Oliveira, J. Zweck, and C. R. Menyuk, "An accurate formula for the Q-factor of a fiber transmission system with partially polarized noise," in Proceedings of the Conference on Lasers and Electro-Optics (CLEO/QELS) 2003, paper CThJ2, Baltimore, Maryland, USA, June 1–6, 2003.

63) H. Jiao, **I. T. Lima Jr.**, A. M. Oliveira, Y. Sun, J. Zweck, L. Yan, C. R. Menyuk, and G. M. Carter, "Experimental validation of an accurate receiver model for systems with unpolarized noise," in Proceedings of the Conference on Lasers and Electro-Optics (CLEO) 2003, paper CThJ1, Baltimore, Maryland, USA, June 1–6, 2003.

64) S. E. Minkoff, J. Zweck, A. M. Oliveira, **I. T. Lima Jr.**, and C. R. Menyuk, "Numerical simulation and analysis of fiber optic compensators," Society for Industrial and Applied Mathematics (SIAM) Annual Meeting, Montreal, Quebec, Canada, June 16–20, 2003.

65) **I. T. Lima Jr.**, A. M. Oliveira, J. Zweck, and C. R. Menyuk, "Computation of the Q-factor in optical fiber systems using an accurate receiver model," in Proceedings of the Optical Fiber Communication Conference and Exposition (OFC) 2003, paper MF81, Atlanta, Georgia, USA, March 23–28, 2003.

66) A. M. Oliveira, **I. T. Lima Jr.**, B. S. Marks, C. R. Menyuk, and W. L. Kath, "Performance analysis of single-section PMD compensators using multiple importance sampling," in

Proceedings of the Optical Fiber Communication Conference and Exposition (OFC) 2003, paper ThA3, Atlanta, Georgia, USA, March 23–28, 2003.

67) Y. Sun, **I. T. Lima Jr.**, A. M. Oliveira, H. Jiao, J. Zweck, L. Yan, C. R. Menyuk, and G. M. Carter, "Effects of partially polarized noise in a receiver," in Proceedings of the Optical Fiber Communication Conference and Exposition (OFC) 2003, paper MF82, Atlanta, Georgia, USA, March 23–28, 2003.

68) Y. Sun, A. M. Oliveira, **I. T. Lima Jr.**, L. Yan, J. Zweck, C. R. Menyuk, and G. M. Carter, "Accurate Q-factor distributions in optical transmission systems with polarization effects," in Proceedings of the Optical Fiber Communication Conference and Exposition (OFC) 2003, paper ThJ4, Atlanta, Georgia, USA, March 23–28, 2003.

69) J. Zweck, S. E. Minkoff, A. M. Oliveira, **I. T. Lima Jr.**, and C. R. Menyuk, "A comparative study of feedback controller sensitivity to all orders of PMD for a fixed DGD compensator," in Proceedings of the Optical Fiber Communication Conference and Exposition (OFC) 2003, paper ThY2, Atlanta, Georgia, USA, March 23–28, 2003.

70) C. R. Menyuk, R. Holzlöhner, **I. T. Lima Jr.**, B. S. Marks, and J. Zweck, "Advances in modeling high data rate optical fiber communication systems," (invited) SIAM Conference on Computational Science and Engineering (CSE03), San Diego, California, USA, February 10–13, 2003.

71) J. Zweck, **I. T. Lima Jr.**, R. Holzlöhner, C. R. Menyuk, "New advances in modeling optical fiber communication systems" (invited), in Proceedings of the Integrated Photonics Research OSA Topical Meeting and Exhibit, paper IThB1, Vancouver, British Columbia, Canada, July 17–19, 2002.

72) **I. T. Lima Jr.**, A. M. Oliveira, J. Zweck, and C. R. Menyuk, "Computation of the penalty due to the polarization effects in a wavelength-division multiplexed system using a reduced Stokes model with a realistic receiver," Venice Summer School on Polarization Mode Dispersion (VSS) 2002, Venice, Italy, June 24–26, 2002.

73) A. M. Oliveira, **I. T. Lima Jr.**, T. Adali, and C. R. Menyuk, "Compensation of polarization mode dispersion in optical fiber transmission systems using a polarization diversity receiver," Venice Summer School on Polarization Mode Dispersion (VSS) 2002, Venice, Italy, June 24–26, 2002.

74) A. M. Oliveira, **I. T. Lima Jr.**, T. Adali, and C. R. Menyuk, "Comparison of power penalties due to first and all-order PMD distortions," in Proceedings of the 28th European Conference on Optical Communication (ECOC) 2002, paper 7.1.2, Copenhagen, Denmark, September 8–12, 2002.

75) **I. T. Lima Jr.**, A. M. Oliveira, Y. Sun, J. Zweck, B. S. Marks, G. M. Carter, and C. R. Menyuk, "Computation of the outage probability due to the polarization effects using importance sampling," in Proceedings of the Optical Fiber Communication Conference and Exhibit (OFC) 2002, paper TuI7, Anaheim, California, USA, March 17–22, 2002.

76) B. S. Marks, **I. T. Lima Jr.**, and C. R. Menyuk, "Autocorrelation function for PMD emulators with rotators," in Proceedings of the Conference on Laser and Electro-Optics (CLEO) 2002, paper CWH5, Long Beach, California, USA, May 20–23, 2002.

77) A. M. Oliveira, T. Adali, **I. T. Lima Jr.**, and C. R. Menyuk, "Polarization diversity and equalization for PMD mitigation," in Proceedings of the IEEE International Conference on Acoustics Speech and Signal Processing (ICASSP) 2002, Orlando, Florida, USA, May 13–17, 2002.

78) A. M. Oliveira, T. Adali, **I. T. Lima Jr.**, and C. R. Menyuk, "Polarization diversity receiver for PMD mitigation," in Proceedings of the Optical Fiber Communication Conference and Exhibit (OFC) 2002, paper WI7, Anaheim, California, USA, March 17–22, 2002.

79) Y. Sun, B. S. Marks, **I. T. Lima Jr.**, K. Allen, G. M. Carter, and C. R. Menyuk, "Polarization state evolution in recirculating loops," in Proceedings of the Optical Fiber Communication Conference and Exhibit (OFC) 2002, paper ThI4, Anaheim, California, USA, March 17–22, 2002.

80) W. L. Kath, G. Biondini, **I. T. Lima Jr.**, B. S. Marks and C. R. Menyuk, "Calculations of outage probabilities due to PMD using importance sampling," (invited) in Proceedings of the LEOS Annual Meeting 2001, paper WAA2, San Diego, California, USA, November 14–15, 2001.

81) G. Biondini, W. L. Kath, **I. T. Lima Jr.**, and C. R. Menyuk, "A simulation technique for rare polarization mode dispersion events," OSA Annual Meeting 2001, paper ThNN1, Long Beach, California, USA, October 14–18, 2001.

82) C. R. Menyuk, R. Holzlöhner, and **I. T. Lima Jr.**, "New approaches for modeling high data rate optical fiber communication systems," (invited) OSA Annual Meeting 2001, paper ThFF1, Long Beach, California, USA, October 14–18, 2001.

83) **I. T. Lima Jr.**, G. Biondini, B. S. Marks, W. L. Kath, and C. R. Menyuk, "Analysis of polarization mode dispersion compensators using importance sampling," in Proceedings of the Optical Fiber Communication Conference and Exhibit (OFC) 2001, paper MO4, Anaheim, California, USA, March 17–22, 2001.

84) A. M. Oliveira, **I. T. Lima Jr.**, T. Adali, and C. R. Menyuk, "PMD mitigation using diversity detection," in Proceedings of the IEEE LEOS Summer Topical Meeting 2001, paper MD3.3, Copper Mountain, Colorado, USA, July 30–1 August 2001.

85) C. R. Menyuk, R. Holzlöhner, and **I. T. Lima Jr.**, "Advances in Modeling of Optical Fiber Transmission Systems," (invited) in Proceedings of the IEEE LEOS Summer Topical Meeting 2001, paper MD1.2, Copper Mountain, Colorado, USA, July 30 – August 1, 2001.

86) **I. T. Lima Jr.**, G. Biondini, B. S. Marks, W. L. Kath, and C. R. Menyuk, "Optimization of a PMD Compensator with Constant Differential Group Delay Using Importance Sampling," (upgraded to invited), in Proceedings of the Conference on Laser and Electro-Optics (CLEO) 2001, paper CFE3, Baltimore, Maryland, USA, May 6–11, 2001.

87) Y. Sun, **I. T. Lima Jr.**, H. Jiao, J. Wen, H. Xu, H. Ereifej, C. R. Menyuk, and G. Carter, "Variation of system performance in a 107 km dispersion managed recirculating loop due to polarization effects," in Proceedings of the Conference on Lasers and Electro-Optics (CLEO) 2001, paper CFE4, Baltimore, Maryland, USA, May 6–11, 2001.

88) **I. T. Lima Jr.**, R. Khosravani, P. Ebrahimi, E. Ibragimov, A. E. Willner, and C. R. Menyuk, "Polarization mode dispersion emulator," in Proceedings of the Optical Fiber Communication Conference and Exhibit (OFC) 2000, paper ThB4, Baltimore, Maryland, USA, March 5–10, 2000.

89) C. R. Menyuk, D. Wang, R. Holzlöhner, **I. T. Lima Jr.**, E. Ibragimov, and V. S. Grigoryan, "Polarization mode dispersion in optical transmission systems," (tutorial), in Proceedings of the Optical Fiber Communication Conference and Exhibit (OFC) 2000, Baltimore, Maryland, USA, March 5–10, 2000.

90) **I. T. Lima Jr.** and A. J. Giarola, "Frequency selective properties of arrays of rectangular dielectric waveguides," in Proceedings of the VIII Brazilian Symposium of Microwave and Optoelectronics, pp. 330–334, Joinville, Santa Catarina, Brazil, July 13–15, 1998.

91) **I. T. Lima Jr.** and A. J. Giarola, "Electromagnetic wave propagation in a periodic array of rectangular dielectric waveguides," in Proceedings of the 1997 SBMO/IEEE MTT-S International Microwave and Optoelectronics Conference, pp. 413–418, Natal, Rio Grande do Norte, Brazil, August 11–14, 1997.
92) **I. T. Lima Jr.** and A. J. Giarola, "Analysis of two-dimensional dielectric gratings for the design of dichroic structures," in Proceedings of the 22nd International Conference on Infrared and Millimeter Wave, p. 342, Wintergreen, Virginia, USA, July 20–25, 1997.
93) **I. T. Lima Jr.** and A. J. Giarola, "Electromagnetic wave propagation in two dimensional anisotropic dielectric gratings," in Proceedings of the 1997 IEEE-AP-S International Symposium, pp. 2400–2403, Montreal, Quebec, Canada, July 13–18, 1997.

Patents and other intellectual properties

1) **I. T. Lima Jr**., "Method and Device for Lucid Dream Experience," Provisional US Patent Serial No: 63194320, filed on May 28, 2021.
2) **I. T. Lima Jr.**, D. Nawarathna, F. D. Gudagunti, and L. Velmanickam, "Method for Detecting and Quantifying Biological Molecules using Dielectrophoresis," Patent Application No. US 2019/0234,902, August 1, 2019.
3) V. R. Marinov and **I. T. Lima Jr**., "Volumetric display based on two-photon absorption in quantum dot dispersions," Provisional US Patent Serial No: 61/230,081, filed on July 30, 2009.
4) R. Khosravani, P. Ebrahimi, **I. T. Lima Jr.**, E. Ibragimov, A. E. Willner, and C. R. Menyuk, "Polarization mode dispersion emulator," Patent US 6,542,650 B2, issued on April 1, 2003. Licensed to Phaeton Communications, Fremont, California, USA.
5) **I. T. Lima Jr.**, and C. R. Menyuk, "Optical communication systems simulator," Software licensed in 2003 to Science Applications International Corporation (SAIC), McLean, Virginia, USA.

Thesis and Dissertations

1) **I. T. Lima Jr.**, "Investigation of the performance degradation due to polarization effects in optical fiber communications systems," Ph.D. Dissertation, University of Maryland, Baltimore County, Baltimore, Maryland, USA, December 2003.
2) **I. T. Lima Jr.**, "Analysis of the frequency selectivity of two-dimensional periodic dielectric gratings," M.Sc. Thesis, University of Campinas (UNICAMP), Campinas, São Paulo, Brazil, March 1998.

Invited Research Seminars

1) **I. T. Lima Jr.**, "Monte Carlo method applied to optical coherence tomography design," Dept. Physics and Astrophysics, University of North Dakota, Grand Forks, ND, September 19, 2014.
2) **I. T. Lima Jr**., "Monte Carlo method applied to optical coherence tomography," Department of Electrical Engineering, Federal University of Espírito Santo (UFES), Vitoria-ES, Brazil, July 25, 2014.
3) **I. T. Lima Jr**., "Polarization effects and other impairments in optical fiber communications systems," Department of Electrical Engineering, Federal University of Espírito Santo (UFES), Vitoria, ES, Brazil, July 24, 2014.

4) **I. T. Lima Jr**., "Photonics research in the Photonics & Bioengineering Laboratory at North Dakota State University," Applied Physics Laboratory (APL), Johns Hopkins University, Laurel, MD, USA, June 6, 2014.
5) **I. T. Lima Jr**., "Advanced statistical methods applied to photonics," Department of Electrical Engineering, Federal University of São Francisco Valley (UNIVASF), Juazeiro, BA, Brazil, February 29, 2013.
6) **I. T. Lima Jr.**, "Advanced statistical methods applied to photonics," Department of Physics at Minnesota State University Moorhead, Moorhead, MN, October 5, 2012.
7) **I. T. Lima Jr**., "Novel importance sampling for Monte Carlo method applied to optical coherence tomography," Department of Electrical and Computer Engineering, University of Manitoba, Winnipeg, MB, Canada, February 3, 2012.
8) **I. T. Lima Jr**., "Advanced Statistical Methods Applied to Photonics", School of Electrical and Computer Engineering, University of Campinas, Campinas, SP, Brazil, December 11, 2011.
9) **I. T. Lima Jr**., "Photonics research in the Department of Electrical and Computer Engineering at North Dakota State University", School of Technology, University of Campinas, Limeira, SP, Brazil, September 20, 2011.
10) **I. T. Lima Jr**., "Research in the Photonics & Bioengineering Laboratory at North Dakota State University", University of São Paulo, São Carlos, SP, Brazil, July 27, 2011.

Ph.D. dissertations, M.S. thesis, and M.S. papers supervised/under supervision
1) Munyaradzi Mudzingwa, "Biomedical Engineering," Ph.D. Dissertation for the Ph.D. degree in Biomedical Engineering, North Dakota State University, Fargo, North Dakota, USA, May 2027 (expected).
2) Dhanushka Wijesinghe, "Biomedical Engineering," Ph.D. Dissertation for the Ph.D. degree in Biomedical Engineering, North Dakota State University, Fargo, North Dakota, USA, May 2027 (expected).
3) Fleming Dackson Gudagunti, "Rare molecule biomarker detection using dielectrophoresis spectroscopy," Ph.D. Dissertation for the Ph.D. degree in Electrical and Computer Engineering, North Dakota State University, Fargo, North Dakota, USA, April 12, 2021.
4) Thiago D. S. DeMenezes, "Nonlinear effects in coherent optical fiber communication systems," Ph.D. Dissertation for the Ph.D. degree in Electrical and Computer Engineering, North Dakota State University, Fargo, North Dakota, USA, July 3, 2017.
5) Syed A. M. Kirmani, "Detection and quantification of rare analytes in biological samples using dielectrophoretic spectroscopy," Ph.D. Dissertation for the Ph.D. degree in Electrical and Computer Engineering, North Dakota State University, Fargo, North Dakota, USA, December 12, 2016.
6) Andrew Nawrot, "Wireless Wearable Device for the Acquisition of Boelectric Signals," M.S. Thesis for the M.S. degree in Biomedical Engineering, North Dakota State University, USA, July 6, 2021.
7) Sharmin Afrose, "A Negative Dielectrophoresis Based Method of Detecting Pancreatic Cancer Antigen CA242 in Serum," M.S. Thesis for the M.S. degree in Electrical and Computer Engineering, North Dakota State University, USA, July 6, 2020.
8) Nolan G. Schwarz, "Thrombolysis of blood clots using wirelessly powered inferior vena cava filters," M.S. Thesis for the M.S. degree in Biomedical Engineering, North Dakota State University, USA, April 6, 2018.

9) Alexandre Y. Yamamoto, M.Sc. Thesis for the <u>M.S. degree in Electrical and Computer Engineering</u>, North Dakota State University, Fargo, North Dakota, USA, May 14, 2014.
10) Ross Miller, "Thermo-Mechanical Selective Laser Assisted Die Transfer," M.S. Thesis for the <u>M.S. degree in Electrical and Computer Engineering</u>, North Dakota State University, Fargo, North Dakota, USA, May 5, 2011.
11) Xin Liu, "Modeling the dynamics of tunable gain switched dye lasers using finite difference based exponential time difference method," M.S. Thesis for the <u>M.S. degree in Electrical and Computer Engineering</u>, North Dakota State University, Fargo, North Dakota, USA, November 16, 2007.
12) Kirankumar Minumala, "Comphehensive analysis of laser technology," M.S. Paper for the <u>M.S. degree in Electrical and Computer Engineering</u>, North Dakota State University, Fargo, North Dakota, USA, November 6, 2006.
13) Arvind Navasyam, "Application of design patterns for hardware design," M.S. Paper for the <u>M.S. degree in Electrical and Computer Engineering</u>, North Dakota State University, Fargo, North Dakota, USA, August 9, 2004.

Awards received by advisees
1) Fleming Dackson Gudagunti and Sharmin Afrose, "dImager - Innovative biosensor that detects pancreatic cancer at an early stage," 1st prize in the Innovation Challenge 2019, sponsored by the NDSU Research and Technology Park, held in Fargo, North Dakota, final competition on December 3, 2019.
2) Nolan Schwarz, "Effectiveness of Wireless powered filters in the thrombolysis of blood clots," 1st place in Student Poster Competition and 1st place in Written Paper Competition and 1st place in the Student Written Paper Competition in the 55th Annual Rocky Mountain Bioengineering Symposium, Fargo, North Dakota, on April 13-14, 2018.

Senior design projects advised
1) Brennan Coslett, Sadiyo Hassan, Samuel Scherping, and Ethan Zeltinger, "Wireless Bioelectric Signal Acquisition Devices for the Monitoring of Hospital Patients", North Dakota State University. Period: Fall 2021 and Spring 2022.
2) Charles Cummings, Thomas Hoskins, Karl Stein, and James Utke, "Smart Internet of Things Device for Healthcare Edge Computing System", Advisors: Trung (Tim) Le and Ivan T Lima Jr., North Dakota State University. Period: Spring 2021 and Fall 2021.
3) Nicholas Munsch, Olivier Thiss, Noah Vandal, and Connor Wander, "Waveform generator for a dielectrophoresis-based biosensor", North Dakota State University. Period: Fall 2020 and Spring 2021.
4) Henry Wolf, Quang Dang, Joseph Eicher, Rudolph Meehan, "Ranging system with nanometer precision using optical imaging," North Dakota State University. Period: Fall 2019 and Spring 2020.
5) David Jedynak, James Drewelow, Benjamin Gerber, "Wireless REM sleep monitor," funded by NSF. North Dakota State University. Period: Fall 2017 and Spring 2018.
6) Wesley Mason, Abhishek Sharma, and Michael Schmitt, "Ultrasound crop measurement," funded by the ABEN Department. Period: Summer 2015 and Fall 2015.
7) Britta Olson, James Parrow, Alex Jenkins, Ryan Klemisch, "REM sleep monitor II," funded by the Department of Electrical and Computer Engineering. North Dakota State University. Period: Spring 2013 and Fall 2013.

8) Pete Kronberg, Cole Teske, Garrett Nelson, Huy Ha, "REM sleep monitor," funded by the Department of Electrical and Computer Engineering. North Dakota State University. Period: Spring 2012 and Fall 2012.
9) Anthony Bachmeier, Andrew Brown, Darin Evans, Tomas Fandrich, and Christopher Wallin, "Energy Harvesting," funded by the Department of Electrical and Computer Engineering. North Dakota State University. Period: Fall 2008 and Spring 2009.
10) Matthew Sharpe, Brady Schultz, and Christopher Horne, "Microchip fiber laser amplifier," funded by NASA. North Dakota State University. Period: Fall 2007 and Spring 2008.
11) Shaun Phipps, Alexander Mork, Lyle Richard, and Nick Weisbeck, "Self-Service Machine," funded by Bobcat. North Dakota State University. Period: Fall 2006 and Spring 2007.
12) Shay Stockstad, Dominic Landman, and Brock Simonson, "ECE Web Site," funded by the Department of Electrical and Computer Engineering. North Dakota State University. Project co-advised with Dr. Sung Joo and Prof. Val Tareski. Period: Fall 2005 and Spring 2006.
13) Jennifer Wilken, Betty Wei, and Rebecca Barrows, "Vibrotactile Display," funded by NSF. North Dakota State University. Period: Fall 2004 and Spring 2005.
14) Brian Buresh, Seth Maslowski, and Austin Vansickle, "SVEE Home II: Nurse alert system," funded by NSF. North Dakota State University. Period: Fall 2003 and Spring 2004.

University committees served
1) Promotion, Tenure, and Evaluation (PTE) Committee, Department of Electrical and Computer Engineering at NDSU. Role: <u>Chair</u>. Period: Fall 2020 to Present.
2) Advisory Committee of the Biomedical Engineering Graduate Program, NDSU. Role: Member. Period: Fall 2019 to Present.
3) Technology and Instructional Services Committee, NDSU. Role: <u>Chair</u>. Period: Fall 2020 to Spring 2023.
4) Electrical and Computer Engineering Faculty Search Committee, Department of Electrical and Computer Engineering at NDSU. Role: <u>Chair</u>. Period: Spring 2021.
5) Technology and Instructional Services Committee, NDSU. Role: Member. Period: Fall 2018 to Spring 2020.
6) General Education Review Committee, NDSU. Role: Member. Period: Fall 2018 to Fall 2019.
7) Circuit Analysis Sequence Committee, Department of Electrical and Computer Engineering at NDSU. Role: Member. Period: Spring 2018.
8) Review Committee for the VP for Information Technology, NDSU. Role: Member. Period: Fall 2017 and Spring 2018.
9) Dean of the College of Engineering Search Committee, NDSU. Role: Member. Period: Fall 2016 and Spring 2017.
10) Biomedical Engineering Faculty Search Committee, Department of Electrical and Computer Engineering at NDSU. Role: Member. Period: Spring 2014.
11) Computer Engineering Faculty Search Committee, Department of Electrical and Computer Engineering at NDSU. Role: Member. Period: Spring 2013.
12) Faculty Workload Committee, College of Engineering at NDSU. Role: Member. Period: Fall 2012 and Spring 2013.
13) Promotion and Tenure Committee, Department of Electrical and Computer Engineering at NDSU. Role: Member. Period: From Fall 2010 to Spring 2020.

14) Research and Extension Committee, College of Engineering at NDSU. Role: Member. Period: Fall 2008 and Spring 2009.
15) Assessment Committee, Department of Electrical and Computer Engineering at NDSU. Role: Member. Period: From Fall 2005 to Spring 2008.
16) Web Site Committee, Department of Electrical and Computer Engineering at NDSU. Role: member. Period: From Fall 2004 to Spring 2006.

Service to Student Organizations
1) Faculty Advisor, Amateur Radio Society at North Dakota State University. Period: March 2019 to Present.

Doctoral dissertations and Master's Thesis committees served
1) Intisar Rizwan I Haque, "Developing Computer Aided Algorithms for Automatic Assessment of Psoriasis Disease Severity Using Digital Images," Ph.D. Dissertation for the Ph.D. degree in Biomedical Engineering at the University of North Dakota, Grand Forks, ND, USA, completed in December 2021.
2) Dipankar Mitra, "Transformation Electromagnetics/Optics for Designing and Scanning Antenna Arrays," Ph.D. Dissertation for the Ph.D. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in May 2020.
3) Seyyed Babak Hamidi Perchehkolaei, "Bit Optimized Reconfigurable Network (BORN): A New Pathway Towards Implementing a Fully Integrated Band-Switchable CMOS Power Amplifier," Ph.D. Dissertation for the Ph.D. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in July 2020.
4) Jacob Lewis, "Extraction of Electromagnetic Properties of Metamaterials with Branch Compensation from Phase Tracking", M.S. Thesis for the M.S. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in July 2020.
5) Rounak Pokharel, "Label Free Micro RNA Biomarker Detection in Serum Sample for Potential Diagnosis Application at Point-of-Care Settings", M.S. Thesis for the M.S. degree in Biomedical Engineering at North Dakota State University, Fargo, ND, USA, completed in July 2020.
6) Jalil Nauman, "Development of performance optimized rotation tolerance Viola-Jones based blackbird detection, a throughput optimized asynchronous MAC implementation, and automated wheat lodging estimation," Ph.D. Dissertation for the Ph.D. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in February 2020.
7) Logeeshan Velmanickam, "Implementation of low cost, high-throughput and high sensitive biomarker detection technique in serum/plasma samples by integrating dielectrophoresis and fluorescence based platform," Ph.D. Dissertation for the Ph.D. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in May 2019.
8) Joseph Allen Jr., "Digital image processing and metabolic parameter linearity to non-invasively detect analyte concentration," M.S. Thesis for the M.S. degree in Biomedical Engineering at the University of North Dakota, Grand Forks, ND, USA, completed in February 2019.

9) Mohammad Nadimi, "High Power Operation of the In-Band Diode-Pumped Nd:GdVO4 Lasers," Ph.D. Dissertation for the Ph.D. degree in Electrical and Computer Engineering at the University of Manitoba, MB, Canada, completed in August 2018.

10) Parker Pavlicek, "Semantic Security for the Fast Fading Wiretap Channel," M.S. Thesis for the M.S. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in April 2018.

11) Anirban Ghosh, "Analysis of Secrecy in Multi-User Wireless Network," Ph.D. Dissertation for the Ph.D. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in March 2018.

12) Adam Stolt, "Numerical and Experimental Evaluation of a NACA 0021 Airfoil Employing Shape-Memory Alloy for Active Flow Control," M.S. Thesis for the M.S. degree in Mechanical Engineering at North Dakota State University, Fargo, ND, USA, completed in March 2018.

13) Eric Kubischta, "A Polynomial Time Procedure Converting Error Correcting Codes to Semantically Secured Wiretap Codes," M.S. Thesis for the M.S. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in March 2018.

14) Sayeed Sajal, Ph.D. Dissertation for the Ph.D. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in March 2017.

15) Avik Sarkar, M.S. Thesis for the M.S. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in November 2016.

16) Yinan Cui, Ph.D. Dissertation for the Ph.D. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in November 2016.

17) Brian Booth, M.S. Thesis for the M.S. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in May 2016.

18) Adnan Iftikhar, Ph.D. Dissertation for the Ph.D. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in November 2015.

19) Muhammad Nadeen Rafiq, Ph.D. Dissertation for the Ph.D. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in September 2015.

20) Abdul Hameed, Ph.D. Dissertation for the Ph.D. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in May 2015.

21) Mohammad Kamal Hossam, M.S. Thesis for the M.S. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in November 2014.

22) Syed Naqvi, Ph.D. Dissertation for the Ph.D. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in November 2014.

23) Muhammad Mubeen Masud, Ph.D. Dissertation for the Ph.D. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in August 2014.

24) Chaudhry Mehmood, Ph.D. Dissertation for the Ph.D. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in August 2014.

25) Bilal Ijaz, Ph.D. Dissertation for the Ph.D. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed in April 2014.

26) Deyan Mihaylov, M.S. Thesis for the M.S. degree in Industrial and Manufacturing Engineering at North Dakota State University, Fargo, ND, USA, completed in June 2012.
27) Yamaya S. Machado, Ph.D. Dissertation for the Ph.D. degree in Psychology at North Dakota State University, Fargo, ND, USA, completed in November 2011.
28) Zhou Zhao, M.S. Thesis for the M.S. degree in Electrical and Computer Engineering at North Dakota State University, Fargo, ND, USA, completed on October 22, 2009.
29) Yamaya S. Machado, M.S. Thesis for the M.S. degree in Psychology at North Dakota State University, Fargo, ND, USA, completed on April 30, 2009.
30) Marissa Detschel, M.S. Thesis for the M.S. degree in Physics at North Dakota State University, Fargo, ND, USA, completed on February 20, 2009.
31) Dustin Vaaselar, M.S. Thesis for the M.S. degree in Electrical Engineering at North Dakota State University, Fargo, ND, USA, completed on August 1, 2008.
32) Dawn Feltus, M.S. Thesis for the M.S. degree in Microbiology at North Dakota State University, Fargo, ND, USA, completed on November 13, 2007.
33) Marilyn A. Jayachandran, M.S. Thesis for the M.S. degree in Electrical Engineering at North Dakota State University, Fargo, ND, USA, completed on November 30, 2005.